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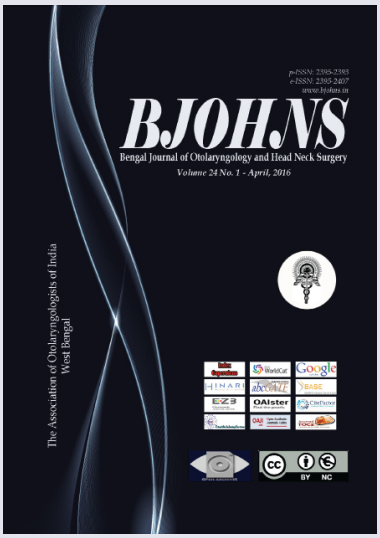

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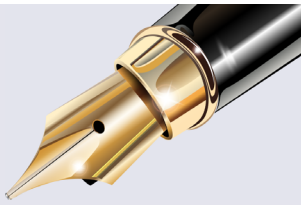
From the Desk of the Editor



When Covid19 spread from Wuhan like a wildfire to engulf most of the countries, it caught the world unawares. It was not that we were not aware of the devastating potentials of a pandemic. It was not that the opinion leaders did not stress upon developing a master plan for comprehensive deployment of the resources to fight an epidemic and minimize the casualty. The erstwhile President of the USA, George Bush, requested for funds from the Congress in 2005 for implementing a strategy to fight any future pandemic. The world failed to act on the cue received from the Ebola outbreak which affected people belonging predominantly to the lower socio-economic strata of a few West African nations. Bill Gates was almost prophetic when he said in 2015 that anything that kills over 10 million people in the next few decades won't be a nuclear war but a highly infectious virus. Exercise Cygnus in October 2016 and Event 201 Pandemic Exercise exposed the important gaps in the pandemic preparedness and response in the UK and the USA. Still, we preferred to spend money and stockpile arms to kill our fellow human beings until this Novel Corona Virus brought the whole humanity to its knees, only this time, without any prejudice to the socio-economic status, geo-political barrier or rural-urban divide.

SARS-CoV-2 has hitherto been unknown to the scientific community. Since its first identification in December 2019, it has already claimed more than two hundred thousand lives of more than three million affected persons by the end of April, 2020. The speed with which the virus spread and its adaptability surprised the medical community, which scampered to get together at least a semblance of a plan to fight Covid 19. Absence of a vaccine to prevent the spread and the absence of a drug to cure overwhelmed even the best healthcare systems in the world in the wake of the deluge of patients that hit the hospitals.

Absence of any universally acceptable treatment protocol and dearth of infrastructure to deal with an epidemic of such magnitude forced the nations to devise their own plans of action to break the chain of transmission of the virus with inadequately trained medical manpower with due consideration to the strained economic resources. All the measures, irrespective of the form in which they have been enforced, have been tough on the general population and we will continue to feel the disastrous economic and humanitarian consequences of the pandemic for some considerable time to come.

Let us keep our fingers crossed with the hope that the Covid 19 pandemic would become a distant nightmare in the near future. It would be prudent for the post-Covid world to learn from its mistakes and complacencies of the past to work together towards a strong health system with efficient training of manpower and ability of rapid deployment of the medical and humanitarian relief teams to contain any epidemic or disaster; supplemented, of course, by a robust biomedical research establishment for development of medicines and vaccines.

Dr Saumendra Nath Bandyopadhyay
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Antibiotic Use: Knowledge and Practice of Medical Undergraduate Students in Kolkata

Maumita De,[1] Diptanshu Mukherjee[2]

ABSTRACT

Introduction

Excessive use and misuse of antibiotics worldwide, both in human medicine and in agriculture has led to increased occurrence of bacterial resistance. Medical students should be aware of the judicious use of antibiotics, so that they can help the general population in future. Present study assesses knowledge of antibiotic use among first year undergraduate medical students and their practice in own life.

Materials and Methods

An observational, cross sectional study was conducted during a three-month period among first year undergraduate medical students of a teaching hospital in Kolkata. A validated self- administered questionnaire was used to collect the data. The data were analyzed by using simple descriptive statistics. Wherever it was relevant, the Chi-square test was carried out to determine any significant difference.

Results

About 85% of the participants were aware of the indication of antibiotic for treating bacterial infections only. Around 44% of the students had an average knowledge score compared to 28% having good knowledge score. Majority (76%) of the medical students obtained last antibiotics by a doctor's prescription, but 54% completed the course as advised by doctor and purpose of taking antibiotic was fever mainly (41%). Statistically significant (P< 0.05) difference on pattern of their antibiotic use was found according to their socioeconomic status and knowledge score.

Conclusion

Changing the prescribing behaviour and knowledge of the healthcare professionals can help a lot to achieve rational use of antibiotic. It is also suggested that giving a comprehensive training of antibiotic use to the medical students and creating their awareness about frequent antimicrobial resistance could be a successful and encouraging approach.

Keywords

Antibiotic Use; Knowledge; Practice; Students, Medical; Undergraduate; Surveys and Questionnaires

Discovery of antibiotics is one of the major events in the history of medicine. Antibiotics are organic substances produced by micro-organisms and capable (at low concentration) of inhibiting the growth of or destroying bacteria. Antibiotic use in both preventive and curative therapy have saved life of countless patients, including those who are receiving chemotherapy, who have chronic diseases such as diabetes, end-stage renal disease or rheumatoid arthritis, who have had complex surgeries such as organ transplants, joint replacements or cardiac surgery and improved patient care in general.[1]

Antibiotic use is widespread. A multi-country public awareness survey by World Health Organization in 2015 reported that 65% of respondents across the 12 countries had taken antibiotics in the past six months, including more than one third (35%) who took antibiotics within the past month. Reported antibiotic use is higher (42%) in the lower income countries included in the survey, compared to higher income countries (29%). [2]

However, effectiveness of antibiotics is seriously endangered by the emergence of resistant

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microorganisms.[3] The inappropriate use of antibiotics could result from a complex interaction among various factors: prescriber behaviors and knowledge, diagnostic uncertainty, patient demand, free unchecked over the counter (OTC) availability of antibiotics for human, animal and industrial consumption and macro level factors such as sociocultural, economic, and health care regulatory policy.[4] From patient's perspective, improper antibiotics use such as skipping of doses, reuse of leftover medicines, failure to complete treatment and self-medication with antibiotics have been reported.[3]

Every country and continent is facing the threat of antibiotic resistant "super bugs," though the extent and the severity of the problem varies.[5] For instance, study conducted among university students in Karachi reported 47.6% use of antibiotics without doctors' prescription six months prior to study.[6] Furthermore, about 40% of Chinese University students used antibiotics without prescription.[7] India being the country with high infectious disease burden, antibiotics are the most widely and frequently prescribed drugs accounting for the alarming increase in Antimicrobial Resistance (AMR).[8] A study conducted among students of Mumbai University, India revealed that, 68% and 79% participants believed that antibiotics should always be prescribed to treat flu like symptoms and pneumonia.[5]

At present, relatively little is known about the general public's knowledge of antibiotic usage at a global level. First year undergraduate medical students are representing general public without any education regarding antibiotic use. According to World Health Organization, education of healthcare workers and medical students on rational antimicrobial prescribing is an integral part of all antimicrobial resistance containment activities.[9,10] Unlike many other drugs whose use is generally limited to well-trained specialists (e.g., antipsychotics or chemotherapeutic agents), antimicrobials are prescribed by virtually all doctors and allied healthcare practitioners, regardless of training or knowledge.[11-13] Therefore, any lacunae in proper education and training about antibiotic use during undergraduate medical period will have high impact on these future prescribers. Hence the present study was undertaken to assess the knowledge and pattern of antibiotic usage in own life of first year undergraduate medical students and also to determine the relationship between antibiotic related behaviour with socio-demographic profile and knowledge score.

Materials and Methods

Participants:

An observational, descriptive, cross sectional study was undertaken during a three-month period (from January to March 2019) among first year undergraduate students of NRS Medical College Kolkata, India, who were present on the day of data collection in a lecture theatre of same institution and willing to participate in the study. The purpose of the study was explained to them and they were asked to fill up the pre-designed, pre-tested, semi-structured, paper-based questionnaire within half an hour. Prior Institutional ethics clearance and informed verbal consent were obtained from the participants who were assured of anonymity and confidentiality of information collected. They were asked to communicate if they faced any difficulty in understanding the questions. Those who did not complete the full questionnaire within the stipulated time were excluded from the study.

Questionnaire:

The self- administered questionnaire was prepared in English and given to four faculty members of Department of Community Medicine to check for content validity. It comprised of three main parts. First part i.e. socio-demographic profile of the study population included data on age, gender, residence, socioeconomic (S.E) status (according to Modified B.G. Prasad's scale classification of 2019)14, father's occupation, mother's occupation, relative in health related field. Second part contained knowledge of medical students about indication of antibiotics and other eight constructs on how and when to take antibiotics. (Table I)

Based on these eight constructs, knowledge score on antibiotic usage was calculated. For each correct response 1 mark was allotted and for wrong response 0 mark. Total score was 8. It has been arbitrarily classified as good (score 7-8), average (score 4-6), poor (score ≤ 3). Third part of the questionnaire incorporated pattern

Table I: Second part of the questionnaire

CONSTRUCTS	RESPONSE	
	YES	NO
a. Do you take antibiotic only with prescription from doctor		
b. Do you complete the full course of antibiotic prescribed by the physician		
c. Do you take antibiotics to prevent any disease (prophylactically)		
d. Is it necessary to take antibiotics for common cold, flu (viral infections)		
e. Do you save the remaining, leftover antibiotic for the next time when you get sick		
f. Do you return to the physician after the antibiotic treatment		
g. Do you use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness		
h. Do you buy the same antibiotics as they helped you get better, when you had the same symptoms before		

of their own antibiotic usage, e.g., time since they took last antibiotic, way of obtaining it, compliance to last antibiotic course as advised by doctor, reason for non-compliance and purpose of taking last antibiotic.

Statistical analysis:

Collected data were analysed using IBM Statistical Package for Social Science version 20 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics were performed and expressed as proportions (%). Chi-square test and Fisher's Exact test were carried out to determine the relationship between antibiotic usage behavior with socio-demographic profile and knowledge score. P value of <0.05 was considered statistically significant.

Results

A total of 162 students were present on the day of interview and willing to participate in the study, but 11 of them were excluded from the study due to non completion of key variables of the questionnaire. Thus a total of 151 students were included in the study for final analysis.

A. Socio-Demographic Characteristics:

It was seen that most of the study population were in the age group of 18 – 19 years (73.5%), resided in urban area (55%) and belonged to socio-economic class I (68.9%) according to modified B.G. Prasad's scale classification of 2019. Male and female participants were almost equal (51% & 49%) in the study. Fathers of most of the medical students (51.6%) were service holders, while their mothers were mostly (76.8%) homemakers. Relatives of most of the study population (58.3%) were not engaged in health-related field. (Table II)

B.Knowledge on antibiotic usage :

About 84.8% of the first year medical undergraduate students agreed that antibiotics were effective for treating bacterial infections only. (Fig. 1)

Knowledge score of study participants was calculated based on eight questions in the questionnaire as described in methodology section. Median knowledge score was found to be 5 and mean knowledge score as 4.86 + 1.84 S.D. It was seen that maximum percentage (43.7%) of the study population had an average knowledge score compared to 27.8% having good knowledge score. (Fig. 2)

Table II: Sociodemographic profile of the study population (n = 151)

VARIABLES	CHARACTERS	NO (%)
Age Group (years)	17	3 (2.0)
	18-19	111 (73.5)
	20-22	37 (24.5)
Gender	Male	77 (50.9)
	Female	74 (49.1)
Residence	Rural	68 (45.1)
	Urban	83 (54.9)
Socio-economic class	I	104 (68.9)
	II	13 (8.6)
	III	11 (7.3)
	IV	13 (8.6)
	V	10 (6.6)
Father's occupation	Farmer	18 (11.9)
	Business	26 (17.2)
	Health sector	11 (7.2)
	Service	78 (51.6)
	Others (tailor, electrician, driver, mason etc.)	18 (11.9)
Mother's occupation	Homemaker	116 (76.8)
	Health sector	5 (3.3)
	Service	30 (19.9)
Relatives working in health related field	Yes	63 (41.7)
	No	88 (58.3)

C. Pattern of antibiotic usage:

The study revealed that almost three fourth (73.5%) of the study population took antibiotics within last 6 months, while 4 out of 151 students had never taken antibiotic before. Majority of the medical students obtained last antibiotics by a doctor's prescription (75.5%), but 54% completed the course as advised by doctor. Non compliance about full course of last antibiotics was mainly (71% cases) due to feeling better. About 41% of participants took last antibiotics for fever. (Table III)

D. Determinants of antibiotic use behaviour:

First year undergraduate students had different antibiotic use behaviours depending on their socio-demographic profile and knowledge score. 76% female participants obtained last antibiotic from doctor's prescription followed by 11% from medical shop, 8% from family member, 3% from other health professional and 1.4% through online purchase compared to male participants who received last antibiotics from same sources in 71%, 12%, 5%, 7% and 1.3% respectively. The distribution

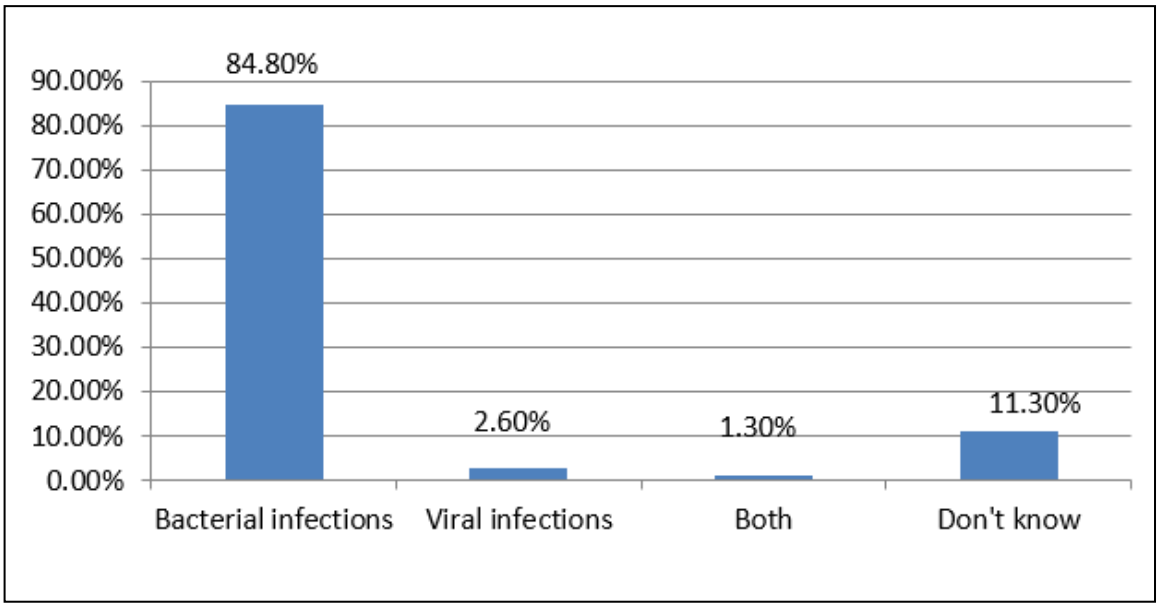

Fig. 1. Graphical representation of age wise distribution of lesions quite nicely depicts the increase in malignancy with increase in age, while the benign section comes down with age

was not statistically significant (P= 0.747).Similarly there was no statistical significant difference found in antibiotic use behaviours among rural and urban students (P= 0.352) and also in case of relatives of the students working in health related field or not (P= 0.629). 80% of medical students belonging to S.E. class V took last antibiotics according to doctor's prescription followed by 76.9% from S.E. class IV, 73% S.E. class I, 72.7% from S.E. class III and 69.2% from S.E. class II and this distribution was found to be statistically significant (P= 0.031).There was a decreasing trend seen in use of last antibiotics as per doctor's prescription, when the knowledge score reduced from good to average to poor (95%, 74% and 51% respectively) and the trend was statistically significant (P= 0.007) (Table IV)

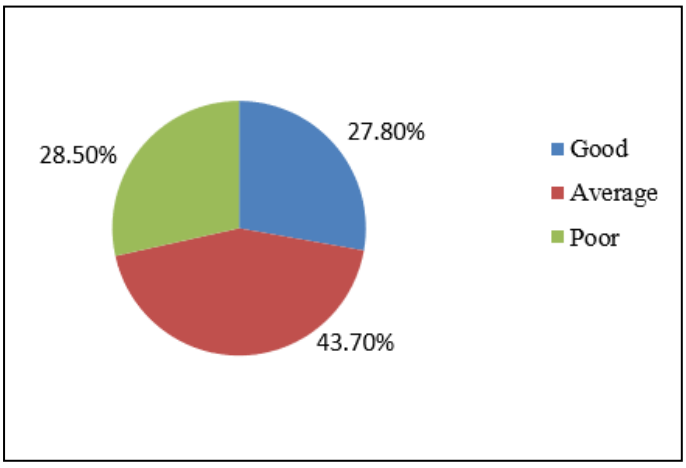

Fig. 2. Pie diagram showing distribution of study population based on their knowledge score of antibiotic usage (n=151)

Discussion

Antimicrobial-resistant organisms are spreading worldwide like wildfire and the main driving factor is irrational use of antibiotics. The future generation doctors must take care of antimicrobial use more responsibly. A cross-sectional study was conducted among first year undergraduate medical students of a NRS Medical College, Kolkata to evaluate their knowledge and pattern of antibiotic usage and to find out the determining factors related to their antibiotic use behaviours.

In the present study most of the students were in the age group of 18-19 years, resided in urban area and belonged to S.E. class I. Male and female participants were almost equal; their fathers were mainly service holders, while their mothers were homemakers predominantly and most did not have any relatives

Table III: Distribution of study population according to their pattern of antibiotic usage

VARIABLES	CHARACTERS	NO (%)
Time since they took last antibiotic (n =151)	Less than 1 month	56 (37.1)
	1- 6 months	55 (36.4)
	6 months - 1year	20 (13.2)
	More than a year	16 (10.7)
	Never	4 (2.6)
Way of obtaining last antibiotic (n =147) *	Doctor's prescription	111 (75.5)
	Friend or family member	10 (6.8)
	Medical shop	17 (11.6)
	Online purchase	2 (1.3)
	Other health professional	7 (4.8)
Compliance to last antibiotic course(as advised by doctor) (n =147) *	Yes	79 (53.7)
	No	68 (46.3)
Reasons for non compliance(n = 68)	After feeling better	48 (70.6)
	Others (switched to homeopathy, worsening of disease condition)	3 (4.4)
	Can't remember	17 (25.0)
Purpose of taking last antibiotic (n =147) *	Fever	60 (40.8)
	Cough & cold	31 (21.1)
	Diarrhoea	7 (4.8)
	Others (postoperative, trauma, eye or ear or throat infection etc.)	35 (23.8)
	Can't remember	14 (9.5)

** 4 out of 151 students did not take antibiotic before.*

engaged in health-related field.

In this study 84.8% of the study population agreed that antibiotics were effective for treating bacterial infections only. Similar findings were reported by different studies in India and abroad: 84% of medical students in Puducherry,[15] 90% of dental & nursing students from Nepal[16] and 92% of Chinese medical students[17] believed the same. It was seen that maximum percentage (43.7%) of the first year students had an average knowledge score compared to 27.8% having good knowledge score. In contrast a study conducted among final-year undergraduate pharmacy students from 5 public universities in Malaysia found most of them (60%) had a good knowledge score.[18] The possible reason being final-year pharmacy students have a relatively good understanding of antibiotic use than first year medical students.

Majority (75.5%) of the medical students in current

Table IV: Determining factors related to antibiotic use behaviours among medical students

FACTORS	WAY OF OBTAINING LAST ANTIBIOTIC						P VALUE
	DOCTOR'S	FRIEND OR FAMILY MEMBER	MEDICAL SHOP	ONLINE	OTHER HEALTH	NEVER TAKEN	
Gender							
Female	56 (75.7)	6 (8.1)	8 (10.8)	1 (1.4)	2 (2.7)	1 (1.4)	0.747
Male	55 (71.4)	4 (5.2)	9 (11.7)	1 (1.3)	5 (6.5)	3 (3.9)	
Residence							
Rural	53 (77.9)	3 (4.3)	5 (7.4)	1 (1.5)	5 (7.4)	1(1.5)	0.352
Urban	58 (69.9)	7 (8.4)	12(14.5)	1 (1.2)	2 (2.4)	3(3.6)	
Socioeconomic class							
I	76(73.0)	10 (9.6)	14(13.5)	1 (1.0)	1 (1.0)	2 (1.9)	
II	9(69.2)	0 (0.0)	1 (7.7)	0 (0.0)	1 (7.7)	2 (15.4)	0.031
III	8(72.7)	0 (0.0)	1 (9.1)	0 (0.0)	2 (18.2)	0 (0.0)	
IV	10(76.9)	0 (0.0)	1 (7.7)	0 (0.0)	2 (15.4)	0 (0.0)	
V	8(80.0)	0 (0.0)	0 (0.0)	1 (10.0)	1 (10.0)	0 (0.0)	
Relatives working in health related field							
No	67(76.1)	4 (4.6)	8 (9.1)	1 (1.1)	5 (5.7)	3 (3.4)	0.629
Yes	44(69.8)	6 (9.5)	9 (14.3)	1 (1.6)	2 (3.2)	1 (1.6)	
Knowledge score							
Good	40(95.2)	0(0.0)	0(0.0)	0(0.0)	1(2.4)	1(2.4)	
Average	49(74.3)	5(7.6)	7(10.6)	1(1.5)	2(3.0)	2(3.0)	0.007
Poor	22(51.2)	5(11.6)	10(23.3)	1(2.3)	4(9.3)	1(2.3)	

study obtained last antibiotics by a doctor's prescription, but 54% completed the course as advised by doctor. Likewise in a study majority (>70%) always consulted a doctor before starting an antibiotic and always completed the full course of the prescribed treatment and showed least self-medication practice among medical undergraduates.[19] While in another study, only 34% students took antibiotics for various reasons and out of them 27% completed the entire course.[20] The present study may have greater risk of recall bias as this study asked about the illness in the past month or the past 12 months or life-time illness, which might overestimate the actual rates of healthcare seeking behavior. Previous study by Kumar et al showed, 46% of 1st year and 22% of 2nd year MBBS students believed that antibiotics need to be prescribed for simple viral illness[21] and in this study also students practiced the same. Although majority undergraduate students in current study followed doctor's prescription, but unexpectedly the purpose of taking last antibiotic was fever mostly (41%) followed by cough & cold (21%). It is perhaps not surprising that one of the major reasons that doctors prescribe antibiotic is patient demand,[22,23] which is likely to be even more common when the patient is a medical student.

While focusing on determinants of antibiotic use behavior among first year medical students, it was found that, it significantly ($P < 0.05$) varied according to socioeconomic class and knowledge score. However, students' practice of obtaining last antibiotic did not differ significantly by gender, residence and their relatives working in health related field. On the contrary Hu et al showed that medical students of China, whose fathers had a higher education level, whose mothers had medical background, who were from urban areas and having high KAP scores were significantly more prone to self-medicate with antibiotics.[17] A probable explanation of the high rate of seeking doctor's advice among the students belonging to S.E. class I could be their affordability and upbringing in an environment of higher education level. Inevitably good knowledge score of participants reflects their better practice of antibiotic use. In several medical schools like Johns Hopkins, Brown University and other U.S universities, antibiotic stewardship program is a compulsory course in current infectious disease fellowship training tenure.[24] Such programmes could be customized for use in developing countries like India.

Limitations:

This was a cross-sectional study conducted in a single Institution, thus it is difficult to ascribe causal associations. Self-administered questionnaire can lead to recall bias. A lecture theatre was chosen as a place of study, therefore conversation between students might not be avoided. But the questionnaire answers were completed within half an hour, there was little time for the students to discuss and would only affect knowledge but not own practice.

Conclusion

Medical students should be taught specifically the judicious use of antibiotic. They should strengthen their communication skills with patients and how to negotiate requests from patients for antibiotics. Medical practitioners are sometimes uncertain how to distinguish between a self-limiting viral illness and a severe bacterial infection; so they need the knowledge and confidence to treat each appropriately without prescribing unnecessary antibiotics. Unsupervised over the counter purchases of antibiotics can be reduced only through changing beliefs and behaviour of patients, doctors as well as pharmacists. National education programs are urgently required to enhance public awareness about rational antibiotic use and it should be incorporated in medical education and outpatient settings to diminish redundant use of antibiotics.

References

1. Piddock LJV. The crisis of no new antibiotics - what is the way forward? The Lancet Infectious Diseases 2012; 12(3): 249-53
2. Antibiotic Resistance: Multi-country Public Awareness Survey. Geneva, Switzerland: WHO;2015. Available from: http://www.who.int/about/licensing/copyright_form/en/index.html [Last accessed on 2019 July 15]
3. Spellberg B, Bartlett JG, Gilbert DN. The future of antibiotics and resistance. The New England J Med. 2013; 368(4): 299-302

4. Franco BE, Mart´ınez MA, S´anchezRodr´ıguez MA, Wertheimer AI. The determinants of the antibiotic resistance process. Infection and Drug Resistance 2009; 2(1): 1-11
5. Gard R. Tackling Antimicrobial Resistance: Optimizing Use of an Older Antibiotic-Amoxicillin. Indian J of Cli Pract. 2014; 24(9): 843-5
6. Shah SJ, Ahmad H, Rehan RB et al. Self-medication with antibiotics among non-medical university students of Karachi: A cross-sectional study. BMC Pharmacology & Toxicology 2014; 15: 74
7. Lv B, Zhou Z, Xu G et al. Knowledge, attitudes and practices concerning self-medication with antibiotics among university students in Western China. Tropical Medicine & International Health 2014; 19 (7): 769-79
8. Prevention and containment of antimicrobial resistance. World health organization. Available at http://www.ino.searo.who.int/LinkFiles/Other_Content_WHD11-Seminar_Presentation-WRpdf. [Last accessed 2019 July 15]
9. The evolving threat of antimicrobial resistance. Options for action. World Health Organization. Available at: http://www.who.int/patientsafety/ implementation/amr/publication/en/index.html. [Last accessed on 2019 July 15]
10. Vickers H. International antibiotic resistance crisis. Better training needed to maintain therapeutic arsenal. Student BMJ 2011; 19: 3207
11. Roumie CL, Halasa NB, Edwards KM, Zhu Y et al.. Differences in antibiotic prescribing among physicians, residents, and nonphysician clinicians. Am J Med. 2005; 118: 641-8
12. Running A, Kipp C, Mercer V. Prescriptive patterns of nurse practitioners and physicians. J Am Acad Nurse Pract. 2006; 18: 228-33
13. Edgar T, Boyd SD, Palame MJ. Sustainability for behaviour change in the fight against antibiotic resistance: a social marketing framework. J Antimicrob Chemother. 2009; 63:230-7
14. Pandey VK, Aggarwal P, Kakkar R. Modified B. G. Prasad Socio-economic Classification, update – 2019. IJCM 2019; 31(01): 123-5
15. Jayabalan N, Selvaraj N, Ganesan S et al. A questionnaire based survey on knowledge, attitude and behaviour of antibiotic usage and resistance among undergraduates in South Indian teaching hospital. International Journal of Basic & Clinical Pharmacology 2018 October; 7 (10): 1991-7
16. Nayak S, Rana M, Mayya SS et al. Antibiotics to cure or harm: Concept of antibiotic resistance among health professional students in Nepal. International Journal of Medical Science and Public Health 2016; 5 (12): 2512-7
17. Hu Y, Wang X, Tucker JD et al. Knowledge, Attitude, and Practice with Respect to Antibiotic Use among Chinese Medical Students: A Multicentre Cross-Sectional Study. Int. J. Environ. Res. Public Health 2018; 15: 1-14
18. Rajiaha K, Rena WS, Jamshed SQ. Evaluation of the understanding of antibiotic resistance among Malaysian pharmacy students at public universities: An exploratory study. Journal of Infection and Public Health 2015; 8: 266-73
19. Padmanabha TS, Nandini T, Manu G et al. Knowledge, attitude and practices of antibiotic usage among the medical undergraduates of a tertiary care teaching hospital: an observational cross-sectional study. International Journal of Basic & Clinical Pharmacology 2016; 5 (6): 2432-7
20. Patil SB, Nagaiah BH, Raikar SR, Rao V. Self-medication practices among 2nd year medical students in a rural medical college of Telangana state. Natl J Physiol Pharm Pharmacol 2018; 8: 5016
21. Bharath Kumar VD, Kalpana L. A comparative study to assess the awareness of antibiotic resistance amongst first and second year medical undergraduate students in a medical college. International Journal of Basic & Clinical Pharmacology 2018 August; 7 (8): 1567-71
22. Hulscher ME, Van der Meer JW, Grol RP. Antibiotic Use: How to Improve It? Int. J. Med. Microbiol. 2010 Aug; 300 (6): 351-6
23. Pan X, Slater M, Beacco A, Navarro X, Bellido Rivas AI, Swapp D et al. The Responses of Medical General Practitioners to Unreasonable Patient Demand for Antibiotics—A Study of Medical Ethics Using Immersive Virtual Reality. PLoS One 2016 Feb 18; 11(2): e0146837. [CrossRef] [PubMed]
24. Ostrowsky B, Nori P, Munjal I, Garcia MDC, Seo SK. Pooling New York City Resources to Educate Fellows About Antimicrobial Stewardship and Infection Prevention and Control. Open Forum Infect. Dis. 2015, 2.

Main Article

Epidemiological Analysis of Maxillofacial Injuries in Road Traffic Accidents: A Peripheral Hospital Based Study

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ABSTRACT

Introduction

The aetiology of maxillofacial fractures is greatly influenced by geographic location, socioeconomic status of the cohort, and the period of investigation. The aim of this study is to analyze and identify characteristics of maxillo-facial fractures that took place in and around Midnapore- Kharagpore city of West Bengal and who presented to a peripheral medical college hospital during a period of 1 year.

Materials and Methods

A detailed database analysis was performed based on data collected from the patients of Road Traffic Accidents (RTA) with sustained facial trauma admitted to General Surgery and Otorhinolaryngology ward of a peripheral medical college hospital. Detailed clinical examination as well as radiological data was collected.

Results

The highest frequency of maxillo-facial injury due to RTA was among the young adults 18-40 years. Most common type of injury encountered is abrasion (44%) followed by bruise and closed fracture. Mandible is the most common bone to get fractured and most common type of Le fort type is Type II. Significant number of patients having RTA were young adults under the influence of alcohol riding in two-wheeler .

Conclusion

With the increasing incidence of RTA awareness must be created concerning safety rules and more policies need to be addressed.

Keywords

Maxillofacial Injuries; Accidents, Traffic.

Maxillofacial injuries constitute a huge disease burden to the present society. They are clinically as well as aesthetically important owing to their close vicinity to vital structures and cosmetic importance. Moreover, Maxillofacial (MF) fractures are often associated with severe morbidity, loss of function, disfigurement, and significant financial cost.[1-3]

The patterns of maxillofacial fracture presentation are consistently influenced by geographic area, socioeconomic status of the cohort, and the period of investigation. According to reports of developing nations, traffic accidents are the main cause of maxillofacial fractures, while data from developed countries pointed to assaults being considered the most frequent etiology of such fractures.[3-5]

With regard to the anatomical sites, mandibular and zygomatic complex fractures account for the majority of all facial fractures and their occurrence varies according to the mechanism of injury and demographic factors, particularly, gender and age. The coordinated and sequential collection of information concerning demographic patterns of maxillofacial injuries may assist health care providers to record detailed and regular

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data of facial trauma. Consequently, an understanding of the cause, severity and temporal distribution of maxillofacial trauma permits clinical and research priorities to be established for effective treatment and prevention of those injuries.

Since face is the most exposed and unprotected part of the skeleton, the psychological impact of disfigurement can be devastating .The aim of this study is to describe the epidemiological profile of maxillo-facial fractures that occurred in and around Midnapore and who presented in the medical college hospital there during a period of one year (September 2017 to August 2018) .

Materials and Method

This was an ambispective study of the patients presenting with maxillo-facial fractures attending the General Surgery and Otorhinolaryngology ward of a peripheral medical college hospital over a period of 1 year. After initial management of the casualty ward, detailed histories were obtained either from the accident victim or from the accompanying persons or police personnel, in cases where the victims were not able to communicate due to medical reasons. The study included all cases of RTA attending the general emergencies with injuries of the MF region except, those who were on immediate life-risk or who did not wish to give the details and who were brought dead.

Each patient underwent a clinical examination as per proforma designed that was specifically developed to investigate the epidemiological features of MF trauma.

Table I: Types of injuries (n=200)

TYPE OF INJURY	NO. OF PATIENTS	PERCENTAGE
Abrasion	**88**	**44%**
Bruise	**72**	**36%**
Fracture (closed)	**22**	**11%**
Fracture (open)	**16**	**8%**
Injury requiring Tracheostomy	**2**	**1%**

(Annexure)

Age groups are divided into children (< 10 years), adolescent (10-17 years), young adults (18-40 years), adults (41-65 years), elderly (> 65 years). Type of injury was classified as Abrasion, Bruise, Closed fracture, Open fracture, Injury requiring Emergency Tracheostomy. Anatomical distribution of maxillofacial fractures was classified as Zygomatico-maxillary complex, Nasal bone, Naso-orbito-ethmoid, Mandible. Mandibular fractures included Body, Angle, Condyle, Symphysis, Ramus, Alveolar process, Coronoid Process.

Results

A total of 200 patients presenting with 237 maxillofacial fractures were analyzed. The ratio of male to female was 2.125:1. Patients' age ranged from 0 to 88 years (mean age 28 ± 16 yrs). The most common age group affected was between 18 to 40 years i.e., the young adults, among them 56 were male and 32 were female. Next common age group was adults of 41- 65 years (29% of total RTA) . The least common age group were the elderly (> 65 years) comprised of only 5.5 % of the total RTA. Distribution of types of injury is depicted in Table I.

Maximum number of RTA were seen in the two wheeler drivers (62%) of whom alcohol smell was present in the breath of 79%, followed by four wheelers (17%) with alcohol smell present among 75% of the drivers. Least number of accidents was encountered with heavy vehicles (6%) with alcohol smell present among 67% of the drivers.

In the study most common type of bone involved was mandible which was 68% of total RTA (Fig. 1). Second most common type was maxilla which was 16% of total RTA. Zygomatic bone involved 11% of the total fractures. Naso-Orbito-Ethmoid (NOE) fractures was seen only in 5% of total RTA. Common sites of mandibular fractures have been depicted in Table II. Fracture distribution in Middle third of the face is tabulated in Table III.

The zygomatic-maxillary complex (ZMC) fracture (Fig.2) was the most commonly encountered fracture among the middle third fractures 49.4 %, followed by

Table II: Sites of mandibular fractures (n=200)

FRACTURE SITE	PREVALENCE	FREQUENCY
Body	47%	94
Angle	26%	52
Condyle	19%	38
Symphysis	5%	10
Ramus	2%	4
Alveolar	1%	2
Coronoid Process	0	0

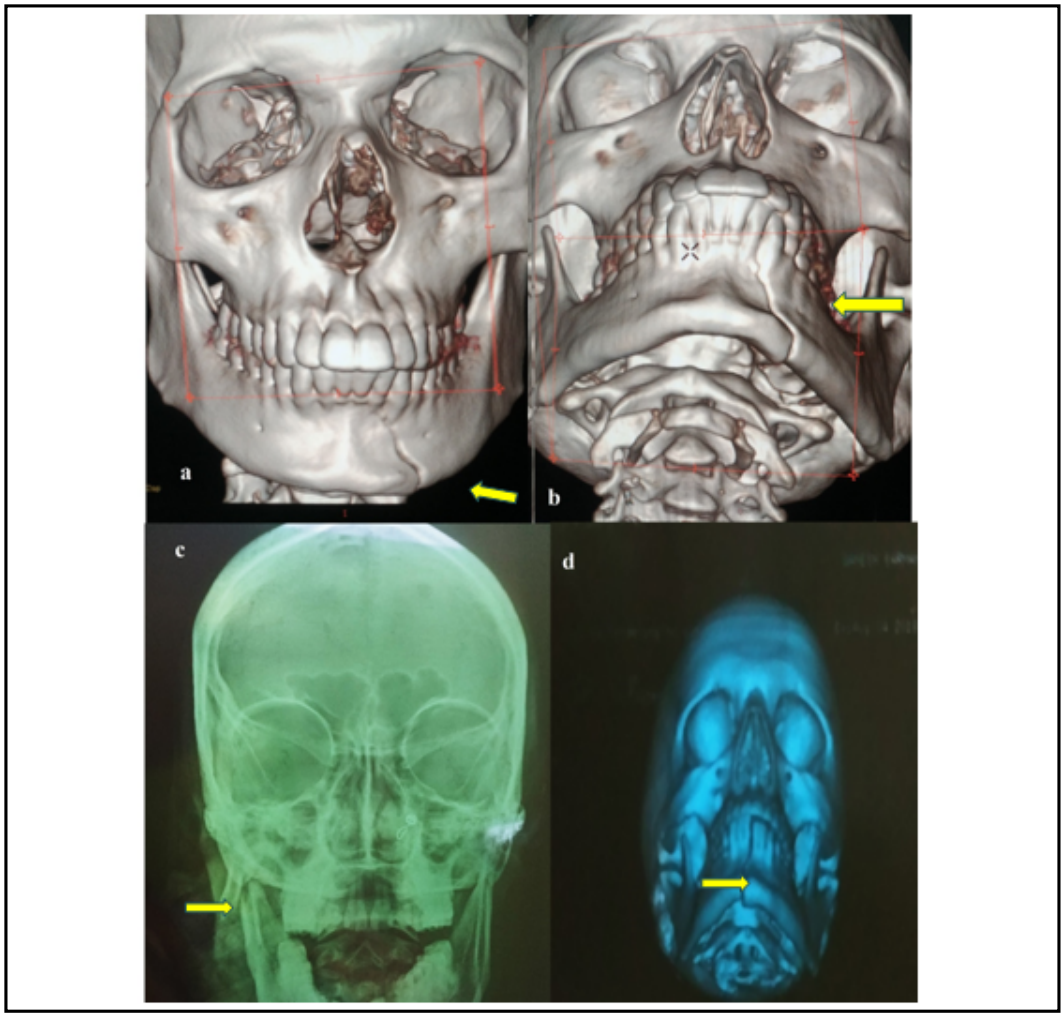

Fig. 1. a & b : Fracture of the body of mandible; c: fracture at the condyle of mandible; d : fracture at the symphysis of the mandible

Table III: Distribution of fracture types in middle third of the face (n=200)

FRACTURE TYPE	PERCENTAGE	FREQUENCY
Le Fort I	6%	12
Le Fort II	12%	24
Le Fort III	3.50%	7
ZMC	46%	92
Dentoalveolar	28%	56
Palatal Split	2%	4
Nasal	1.50%	3
NOE	1%	2

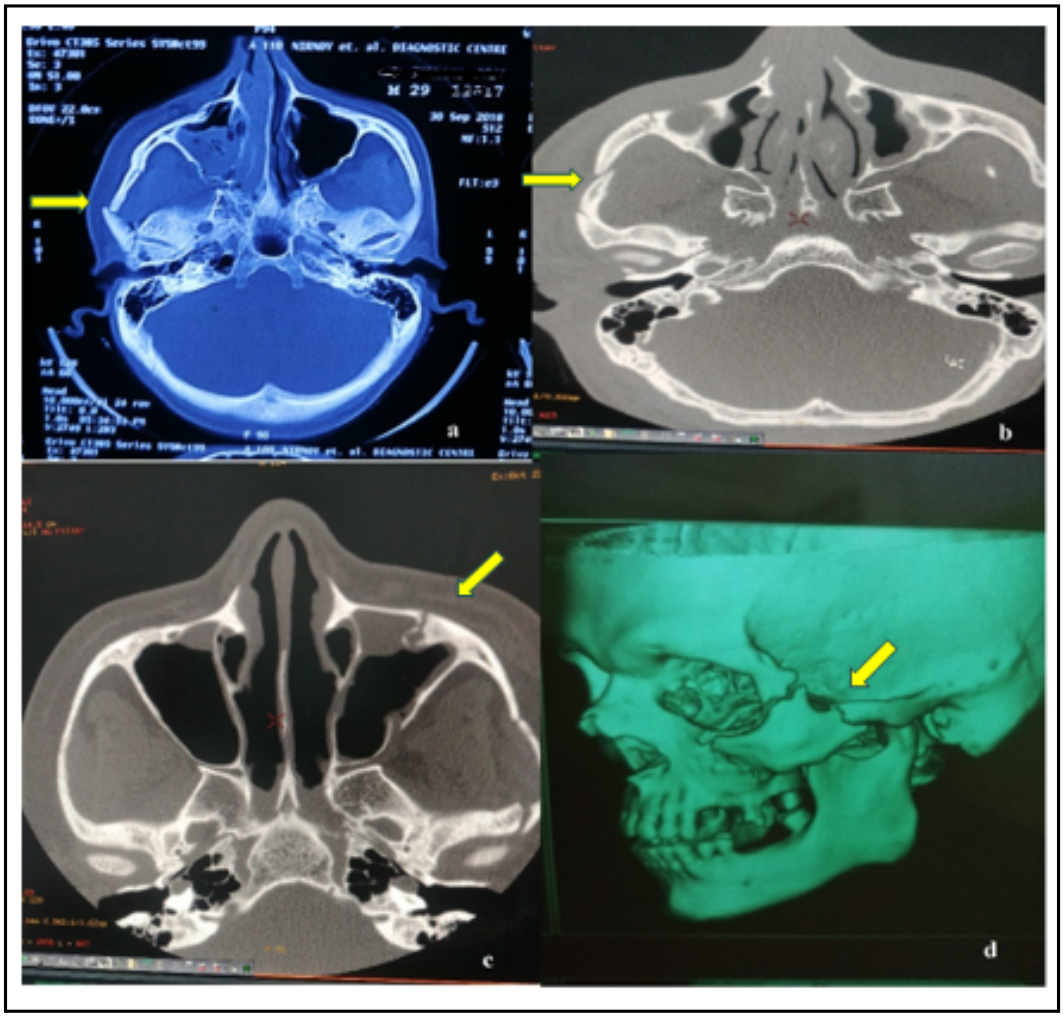

Fig. 2. a, b, c & d : showing fracture of the zygomatic-maxillary complex fracture

dento-alveolar fracture which was 28.3 % of the middle third fractures. Among the Le Fort fractures, type II was the commonest which was 12.1 % and only 0.6 % of the fractures was seen in Naso-Orbito-Ethmoid (NOE) region.

Discussion

We studied a total of 200 patients who presented with maxillofacial fractures among whom there were 68% male and 32% female (Male:female = 2.125:1). In earlier studies done by Gali et al 6, where there was a male predisposition (79.4%) and that by Garkoti et al.[7], where they found male incidence to be 80.77 % and females 19.23%.

Majority of the accidents were encountered among two-wheeler riders (62%) of whom 79% were under alcohol intoxication which were proved by breath test.

The age group most commonly affected was that of 18-40 years (44%). In the study by Sawhney and Ahuja,[8] 77% patients were in the age group of 16-45 yrs .Garkoti et. al[7] also got similar clustering of cases in the 20-30 age group. However in the study by Adeyemo et al.[9] the most vulnerable age group was found 21 -30 years. In another study by Motamedi et al[10], the most common age group affected was 20-29 year.

In our study, the most common site of fracture was the zygomaticomaxillary complex (46%) followed by the Dento-alveolar (28%). However, Dutta et al[11] found that nasal bones were the most commonly fractured (26.3%). Gali et al.[6] found mandible to be commonly fractured (41.7%), which was also supported by studies done by Sawhney et al.[8] In the study of Adeyemo et. al[9] most of the fractures of maxillofacial skeleton were of the mandible, the findings comparable to other reports.[12,13-15] The mobility of the mandible and the fact that it has less bony support than the maxilla have been implicated.[16,17] Dentoalveolar and condylar fractures were reported to be less in Nigerian patients.[18,12,13-15,19]

Dental/dento-alveolar injury is frequently overlooked in surveys that review maxillofacial injury.[20-22] Only the analyses of a large number of injuries reveals the risk of suffering from dento-alveolar trauma.[20-22] Gassner et al[21] in a large series of 9,543 patients with 21,067 maxillofacial injuries reported an incidence of 49.9% of dentoalveolar injuries among their patients. Gassner et al[22] in another large series of craniomaxillofacial trauma in 3,385 children younger than 15 years of age reported an incidence of 76.3% cases of dentoalveolar injuries. Midfacial bone fractures especially LeFort types and orbital floor fractures were reported to be commoner than mandibular fractures[21,22] in contrast to Nigerian

Conclusion

The highest frequency of head injury was among the young adults 18-40 years (44%) Overall male to female ratio was 2.125:1. Significant number of patients having RTAs were young adults under the influence of alcohol riding two-wheeler. The most common structure to be injured in middle third of the face was zygomatic-maxillary complex fracture

Awareness must be created concerning safety rules and especially targeted at the high-risk groups which includes the most economically productive age group.

New policies need to be addressed for better road side assistance, road safety education and emergency treatment protocol for both para-medical and medical staff.

References

1. Down KE, Boot DA, Gorman DF. Maxillofacial and associated injuries in severely traumatized patients: implications of a regional survey. Int J Oral Maxillofac Surg. 1995; 24:409-12
2. Qudah MA, Bataineh AB. A retrospective study of selected oral and maxillofacial fractures in a group of Jordanian children. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2002; 94:310-4
3. Kieser J, Stephenson S, Liston PN, Tong DC, Langley JD. Serious facial fractures in New Zealand from 1979 to 1998. Int J Oral Maxillofacial Surg. 2002; 31:206-9
4. Haug RH, Prather J, Indresano T. An epidemiologic survey of facial fractures and concomitant injuries. J Oral Maxillofac Surg. 1990; 48:926-32
5. Koorey AJ, Marshall SW, Treasure ET, Langley JD. Incidence of facial fractures resulting in hospitalization in New Zealand from 1979 to 1988. Int J Oral Maxillofac Surg. 1992; 21:77-9.
6. Gali R, Devireddy SK, Kumar RK , Kanubaddy SR et al. Faciomaxillary fractures in a semi Urban South Indian Teaching Hospital . A retrospective analysis of 638 cases. Contemporary

Clinical Dentistry 2015; 6:539 .

7. Garkoti PD, Saklani K, Sharma T, Shashi. A descriptive study of fracture distribution in faciomaxillary trauma in Kumaon region. Journal of Evolution of Medical and Dental Sciences .2015; 4(59):10270-6
8. Sawhney CP, Ahuja R.B. Faciomaxillary fractures in North India: A statistical analysis and review of management . British J Oral Maxillofacial Surg. 1988; 26(5):430-4
9. Adeyemo WL, Ladeinde AL, Ogunlewe MO, James O. Trends and characteristics of oral and maxillofacial injuries in Nigeria: A review of the literature. Head Face Med. 2005;1:7
10. Motamedi MH. An assessment of maxillofacial fractures: A 5-year study of 237 patients. J Oral Maxillofac Surg. 2003; 61:61-4
11. Dutta SRB, Soni S, Prakash R. A study on traumatic faciomaxillary fractures encountered at a tertiary care centre of north-eastern India . BJOHNS 2018; 26(2):79-85
12. Brown RD, Cowpe JG. Patterns of maxillofacial trauma in two different cultures. J R Coll Surg Edinb. 1985; 30:299-302
13. Ansari MH. Maxillofacial fractures in Hamedan province, Iran: a retrospective study (1987-2001) J Cranio maxillofac Surg. 2004; 32:28-34
14. Al Ahmed HE, Jaber MA, Abu Fana SH, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004; 98:166-70. doi: 0.1016/j.tripleo.2004.01.020
15. Erol B, Tanrikulu R, Gorgun B. Maxillofacial fractures: Analysis of demographic distribution and treatment in 2901 pateints (25-year expereience) J Craniomaxillofac Surg. 2004; 32:308-13
16. Oji C. Jaw fractures in Enugu, Nigeria, 1985-1995. Br J Oral Maxillofac Surg. 1999; 37:106-9. doi: 10.1054/ bjom. 1997.0083
17. Kelly DE, Harrigan WE. A survey of facial fractures: Bellevue Hospital, 1948-1974. J Oral Surg. 1975; 33:146-9
18. Ugboko VI, Odusanya SA, Fagade OO. Maxillofacial fractures in a semi-urban Nigerian teaching hospital. A review of 442 cases. Int J Oral Maxillofac Surg. 1998; 27:286-9
19. Olasoji HO, Tahir A, Bukar A. Jaw fractures in Nigerian children: an analysis of 102 cases. Cent Afr J Med. 2002; 48:109-12
20. Tuli T, Hachl O, Rasse M, Kloss F, Gassner R. Dentoalveolar trauma analysis of 4763 patients with 6237 injuries in 10 years. Mund Kiefer Gesichtschir. 2005; 9(5):324-9
21. Gassner R, Tuli T, Hachl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: a 10 year review of 9,543 cases with 21,067 injuries. J Craniomaxillofac Surg. 2003; 31:51-61
22. Gassner R, Tuli T, Hachl O, Moreira R, Ulmer H. Craniomaxillofacial trauma in children: a review of 3,385 cases with 6,060 injuries in 10 years. J Oral Maxillofac Surg. 2004; 62:399-407. doi: 10.1016/j.joms.2003.05.013.

Annexure

Proforma for clinical notes of maxillofacial injuries

1. Name-
2. Age-
3. Sex-
4. Date of incident-
5. Time of incidence-
6. Place of incidence-
7. Mode of accident-
   a. Falling down from vehicle
   b. Collision with stationary object
   c. Collision with moving vehicle from front
   d. Collision with moving vehicle from behind
   e. Collision with moving vehicle from side
   f. Collision with street animals
   g. Others
8. Vehicle in which injured person was traveling
   a. Unmotorised two wheelers
   b. Motorised two wheelers
   c. Four wheelers
   d. Not applicable(if injured person was walking)
   e. Others
9. In case of collision, type of vehicle with which collision took place
   a. Motorised two wheelers
   b. Unmotorised two wheelers
   c. Four wheelers
   d. Others
10. Position of injured person in vehicle
   a. Driver of two wheeler
   b. Positioned behind driver in two wheeler
   c. Front seat of four wheelers
   d. Rear seat of four wheelers
   e. Positioned elsewhere in a bigger vehicle
12. State of intoxication
   a. Of injured person-yes/no
   b. Of driver of vehicle if injured person is not the driver-yes/no
   c. Driver of colliding vehicle (of known)-yes/no
13. Type of road where incident occurred
   a. Kuccha village road
   b. Pucca village road
   c. Street roads
   d. Highway
14. Use of personal safety measures
   a. Use of helmets-yes/no/not applicable
   b. Use of seat belts-yes/no/not applicable
15. Loss of consciousness-yes/no
16. Vomiting-yes/no
17. Convulsions-yes/no
18. Types of injury
   A. Abrasion-present/absent. If present, site-
   B. Bruise-present/absent. If present, site-
   C. Laceration-present/absent. If present, site-
   D. Incised wound-present/absent. If present, site-
   E. Cartilage fracture of ear-present/absent
   F. Gross nasal bone fracture-present/absent
   G. Septal hematoma-present/absent
   H. CSF rhinorrhea-present/absent
   I. Penetrating injury over neck-present/absent
   J. Laryngo-tracheal framework injury-present/absent
   K. Epistaxis-present/absent
   L. Emphysema-present/absent
19. Radiological injuries
   A. Intra cranial hemorrhage
   B. Isolated nasal bone fracture
   C. Isolated maxillary fracture
   D. Isolated Temporal bone fracture
   E. Multiple facial bone fracture
   F. Dental injury
   G. Laryngo-tracheal injury
20. GCS at the time of admission

Influence of Khasi Language on Nasal and Oral Passages in English: A Nasometric Study

Indranil Chatterjee,[1] Shubhangi Shree Bhatt,[1] Kavita Kumari,[1] Divya Raj,[1] Vidushi Saxena[1]

ABSTRACT

Introduction

Speech is a overlaid function of respiratory, phonatory, resonatory, articulatory systems . Nasalance can be defined as the relative amounts of oral and nasal acoustic energy in speech done by modification of oral and nasal cativities that is complex activity of the resonator system. Nasometer was developed by Samuel Fletcher, Larry Adams, and Martin McCutcheon at the University is a computer based instrument facilitating accurate analysis of signal yielding nasalance scores. There is no report regarding nasalence score variance in khasi language speakers speaking English.

Materials And Methods

The study aims at analysing and measuring nasalence score in Khasi speakers reading English passages. A total of 5 female subjects were chosen who were native speakers of khasi language and who had exposure of English language since childhoods were selected. Nasometer II Model 6400 (Software version 2.6) of Key Elemetrics Corporation was used. Three standardized passages (Zoo passage, Rainbow passage and nasal sentences) were used for the study.

Result

The mean nasalance scores obtained for zoo, rainbow and nasal sentences in female were 19.39± 12.21 SD, 38.13 ± 14.83 SD, 68.33 ± 15.29 SD and 18.26 ± 3.53 SD, 33.13 ± 1.68 SD, 63.20 ± 88 SD respectively. Standard norms show significant differences in nasalance scores obtained for Zoo, Rainbow and Nasal Sentences. Paired t-test was used for comparison among the sentences and computation of data show more significant differences for nasal sentences as compared to zoo and rainbow sentences, that is significant ($p>0.05$). Rainbow sentences revealed more nasalance scores than zoo sentences ($p>0.05$) i.e. level of significance.

Conclusion

The reported normative Nasalance data can be used by several voice clinicians for assessing resonance quantitively for khasi speakers using austrioasiatic language.

Keywords

Nasometry, Nasalance, Khasi, Voice.

Speech is a overlaid function of respiratory, phonatory, resonatory, articulatory systems that is the audible manifestation of language, whereas language is a set of arbitrary symbols that are socially shared code or conventional system for representation of concepts.[1] Variation in the harmonics of voice modifies resonance. The resonator system has a complex structure. Supraglottal air gaps act as resonators. These are complex air gaps which are found in the tight area that goes through the larynx, the large opening of the larynx, the wide cavity in the mouth and nasal cavity. Normal speech sound production depends on the ability to rapidly couple and decouple the nasal cavity from the oral cavity. Nasal speech sound require oral nasal coupling and oral sounds require oral nasal decoupling.

The process of coupling and decoupling the oral and nasal cavities for speech is called velopharyngeal valving. This valving is controlled by the elevation

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of the velum and constriction of the pharyngeal walls.

Role of velopharyngeal mechanism in speech production: The degree of acoustic coupling occurring between oral and nasal cavities causes variations in velopharyngeal functioning. Movement of velum is essential for distinctions in oral and nasal speech sounds. The two important parameters of articulation are adequate velopharyngeal closure and valving action time. Adequate closure can be achieved by elevation and retraction of soft palate along with constriction of nasopharyngeal walls at the same time. In individuals with short palate the posterior pharyngeal wall may move anteriorly to meet the soft palate as a compensatory gesture activity.[2]

There are basically three patters of velopharyngeal closures that had been described in normal subjects; (1) coronal pattern where closure is primarily by velar elevation, (2) circular pattern (with or without Passavant's ridge), in which medial movement to the velum effects closure, (3) sagittal pattern causing medial movement of the lateral pharyngeal wall and the velum contacting the lateral walls rather than posterior wall effecting the closure.[3]

Five muscles are involved in the velar functions which are levator veli palatine, uvular muscles, tensor veli palatine, palatopharyngeus, and palatoglossus. Elevation of velum is primarily by contraction of the levator veli palatine muscles.[2,4,5] Velopharyngeal closure is accomplished by the coordinated movement of all of above structures.

The velopharyngeal closure occurs for speech, pneumatic activities (sucking, blowing, whistling) and non- pneumatic activities (gagging, swallowing, and vomiting). However the degree of closure and position differ in all the above activities; even in different phonemes and with different phonetic environments variations can be seen.[3] Closure may be adequate for pneumatic activities but insufficient for speech or other pneumatic activities.[3]

Nasalance can be defined as the relative amounts of oral and nasal acoustic energy in speech. Nasalisation refers to the lowering of the velum during the vowels or other consonants. Fletcher and Frost (1974) first proposed the term nasalance for the measure of velopharyngeal closure during voiced speech in which nasally emitted acoustic energy is compared to the orally emitted energy.

Nasometer was developed by Samuel Fletcher, Larry Adams, and Martin McCutcheon at the University of Alabama, Birmingham. It is a computer based instrument facilitating accurate analysis of signals, yielding nasalance scores.

A numeric ratio of nasal acoustic energy to the sum of nasal plus oral acoustic energy is calculated, multiplied by 100 and expressed as a "nasalance score" that is (N/(N+O)) x 100 = Nasalance) and is displayed graphically on the host computer screen in real time.

The output of this instrument provides the user with a score that reflects the relative amount of nasal acoustic energy in a subject's speech. Standardized nasometry scores have been published in several languages such as English;[6,7] Flemish;[8] Thai.[9]

The nasalance score is a valid correlate of perceived nasality,[10] has a high specificity (86%), a high sensitivity (87%), and a high overall efficiency (87%).[11] Nasalance score has a limited implication for cross-country or cross language comparison because interpretation for identifying normal and abnormal based on the cut off scores is difficult. Therefore, it should be a supplementary but not a substitute for clinical judgment.[12]

Khasi is an Austroasiatic language spoken primarily in Meghalaya state in India by the Khasi people and also by some population in Assam and Bangladesh. India is a multilingual country. In countries where English is spoken as second or third language there might be different interpretation of Nasalance scores in English passages. From the review it is evident that nasal resonance varies in speech sound of different languages and even in different dialects of same language.

It is well established that differences in nasalance scores occur among different native languages. The frequency of phonemic distribution varies in different languages. The distribution of phonemes is different in different languages; standard passage for each

language should be developed. The corresponding normative nasalance scores should be computed for each language or regional dialect[6] because vowels are intentionally nasalized in some languages (e.g., French) and some regional dialects, for instance, English Phonetician often described the vowel in American English dialects as more nasalized then the same vowel in Queen's English. For American English,[10] Australian English,[7] German,[13] Castilian Spanish,[13] Finnish[14] and Midwest Japanese[15] these normative nasalance score have been computed.

The study aimed at analysing the impact of Nasalance on khasi speakers reading English passages to compare the mean Nasalance scores across the passages between native khasi speakers and native English speakers and to compute the differences of mean Nasalance between the passage.

Materials and Methods

Written consent was taken from all the candidates. A total of 5 native Khasi female speakers in the age range 18-25 years (mean age 22 years) (SD=1.58) were enrolled for the study. The participants were selected from AYJNISHD (RC) whose native language is Khasi and use English as their second or third language.

Inclusion criteria ensured that a participant should be a native and speaker of local dialect, who can read English fluently and is willing to participate in the study.

Participant with non-intelligible speech or suffering from organic/non organic voice disorder were not considered as also those who had respiratory difficulties or had been suffering from cough or cold.

Speech tools

The speech stimuli includes- zoo passage[16] which excluded nasal consonants in English language, and rainbow passage,[17] containing 11.5% nasal consonants in English language. A set of five nasal sentences were taken from the manual of Nasometer II which contained 35% nasal consonants in English.[18]

Calibrated Nasometer II Model 6400 (software version 2.6) of Key Elemetrics Corporation, connected to a desktop computer model (HCL Pentium 4) was used for measurement of mean nasalance in this study. Nasometer was housed in a quiet room which was partially acoustically treated in the clinic of AYJNISHD(RC).

Procedure

The subjects were asked to read the standardised passages and then their mean Nasalance scores were analysed. Three trials were taken for each passage. The subjects were instructed to start reading after the recording icon was clicked and care was taken that the subjects do not repeat a syllable once spoken, and also do not add fillers like /umm, or /aa / in between.

The nasometer headpiece was positioned in such a way that the oral and nasal microphones were at equivalent distances from the mouth and nose.

Nasalance is derived by the formula: Nasalance = { nasal (n)/nasal (n) + oral (o)} x 100 }

Data compilation

The data obtained was compiled in Microsoft excel worksheet of Windows version 8.1, mean and standard deviation were calculated and applicable statistics was done.

Statistical analysis

Analysis was done on SPSS software (version 16.0). Paired t- test was used to compare the mean Nasalance differences between the oral and nasal passages and among the passages.

Results

The different acoustical filtering used in Nasometer offer significant differences in nasalance scores as it measures sound intensity in a 300 Hz band around a centre frequency of 500 Hz. Thus most of the acoustic energy measured is associated with vowels,

Table I: Mean nasalance scores and standard deviation for all native khasi speakers as measured on Nasometer II on nasal passage, rainbow passage, zoo passage

VARIABLE	N	MEAN	S. D	MINIMUM	MAXIMUM
NASAL PASSAGE	5	68.33	15.29	6.93	96.852
RAINBOW PASSAGE	5	38.13	14.83	4.66	96.662
ZOO PASSAGE	5	19.39	12.21	4.4	72.13

primarily the first formant of vowels. A study done by Rodger et al. ,1991, 1993 reported nasometer to be sensitive (0.89) and specific (0.95) acting as a diagnostic tool for measuring nasalance with the overall efficiency of 0.87.[11]

Mean nasalance for nasal passage, rainbow passage and zoo passage

All 5 khasi native speaker participants were asked to read passages and the mean nasalance scores were analysed. Mean and standard deviation of mean nasalance scores for nasal passage, rainbow passage, zoo passage were calculated. (Table I)

Nasal Sentences showed higher Nasalance score as compared to Zoo passage and rainbow passage, rainbow passage revealed better scores as compared to zoo passage, zoo passage showed little variance from the norms.

The major differences in nasal and oral vowels are due to the position of soft palate. Jones (1976) defined nasal sounds as those sounds that are produced by closing the oral cavity completely at some point with soft palate held at lowered position so that air stream is free to pass through the nose. Following this definition , in khasi language, there are essentially 4 nasal consonant phonemes i.e. /m, /n/, /ŋ. Due to the coupling of the buccal and nasal cavities, the first formant of all nasal vowels is slightly reduced in intensity. Generally speaking, the nasal vowels are in the same articulatory position as the corresponding oral vowels.[14] Intonation patterns are also varied in khasi speakers. Stress in final syllable is a common feature of Austro-Asiatic family, including Khasi language.[19]

Differences of mean nasalance between the passages

Computation of differences in mean and standard deviation of mean nasalance scores were done between nasal passage and rainbow passage, rainbow

Table II: Mean and standard deviation of mean nasalance score for nasal passage and rainbow passage, rainbow and zoo passage, nasal passage and zoo passage

PASSAGE	N	MEAN	SD
Nasal passage	5	68.33	15.29
Rainbow passage	5	38.13	14.83
Diff(1-2)		30.2	15.06
Rainbow passage	5	38.13	14.83
Zoo passage	5	19.39	12.21
Diff(1-2)		18.74	13.52
Nasal passage	5	68.33	15.29
Zoo passage	5	19.39	12.21
Diff(1-2)		48.94	13.75

Table III: Comparison of means for nasal passage and rainbow passage , rainbow passage and zoo passage, nasal passage and zoo passage

PASSAGES	VARIANCES	DF	T- VALUE	PR>/T/
Nasal passage and Rainbow passage	Equal	4	6.039	<0.0037
Rainbow passage and Zoo passage	Equal	4	9.173	<0.0007
Nasal passage and Zoo passage	Equal	4	8.85	<0.0009

passage and zoo passage, nasal passage and zoo passage. (Table II)

The degree of freedom and t value comparison of means for nasal passage and rainbow passage, rainbow passage and zoo passage, nasal passage and zoo passage have been shown in Table III.

The result depicted significant difference in mean Nasalance scores of Nasal Sentences and Zoo passage for all 5 native khasi subjects. Nasal Sentences showed higher Nasalance score as compared to Zoo passage.

The mean of nasal sentences and rainbow passages were calculated to find out the mean Nasalance. Significant differences were found between the nasal sentences and Rainbow passage. Thus, the results indicate higher Nasalance values for nasal Sentences.

The mean of Rainbow passage and Zoo Passage were calculated to find out comparison of mean nasalance. Higher significant difference of Nasalance scores was obtained for Rainbow Passage as compared to the Zoo Passage.

Discussion

When the comparison of mean Nasalance scores was made between native khasi language speakers and standardised normative scores of native English language speakers, a significant difference was observed for zoo passage (Diff in mean = 7.75), rainbow passage (diff in means = 6.66) and nasal passage (diff in mean = 8.78). This higher nasalance for nasal sentences are evident from Table IV in khasi speakers, also supported by previous findings in other languages by various researchers,[3] across oral and nasal stimuli using Malayalam, Hindi, Bangla languages.[7]

Most of the studies done revealed higher nasalance in adult females which can be attributed to higher average pitch levels[20] and the use of greater pitch variability. Females also use different intonation patterns and voice markers for resonance, loudness, and voice quality in their speech.[21]

Table IV: Mean and standard deviation of Khasi speakers and standard norms across the passage

	KHASI SPEAKER		STANDARD NORMS	
PASSAGE	MEAN	SD	MEAN	SD
Nasal passage	68.33	15.29	59.55	7.96
Rainbow passage	38.13	14.83	31.47	6.65
Zoo passage	19.39	12.21	11.25	5.63

Conclusion

This is a preliminary study on female khasi speakers with small sample size for showing the impact of Nasalance on English language. Thus more number of Meghalayan candidates must be chosen and explored, with the consideration of dialectal variations, for establishing a standardised normative of Nasalance scores for khasi people so that better interpretation and diagnosis of khasi patients can be done. Also gender variations can be better observed by increasing the sample size of subjects and norms can be established for reference purposes. The reported normative Nasalance data can be used by several voice clinicians for assessing resonance quantitatively. The normative scores can be used for assessment of different resonance disorders like cleft lip and palate, motor speech disorder, hearing impairment, functional nasality problems, singing pedagogy.

References

1. Owens R. Language development: An introduction. Ayyn and Bacon communication sciences and disorders series Pearson education ,8 revised edition, Newyork: Macmillan, Pearson 2012, p. 6
2. Zemlin WR. Speech and Hearing Science, Anatomy and Physiology. 3 edition , Rentice Hall, Englewood Cliffs, New Jersey , Allyn & Bacon 1988, p. 275
3. Shprintzen RJ, McCall GN, Skolnick ML, Lencione RM. Selective movement of the lateral aspects of the pharyngeal walls during velopharyngeal closure for speech, blowing, and whistling in normals. The Cleft Palate Journal 1975 Jan;12(00):51-8
4. Seikel JA, King DW, Drumright DG. Anatomy and physiology for speech and language, and hearing , 4th ed, Delmar cengage learning, 2009, p.328 5. Kent, R. The Speech Sciences. Edition illustrated San Diego, London: The university of Michigan, Singular Publishing group ,1997,p. 194
5. Seaver EJ, Dalston RM, Leeper HA, Adams LE . A study of nasometric values for normal nasal resonance. Journal of Speech, Language and Hearing Research. 1991 Aug; 34(4):715-21
6. Van Doorn J, Purcell A. Nasalance levels in the speech of normal Australian children. The Cleft Palate-Craniofacial Journal 1998 Jul; 35(4):287-92
7. Van Lierde KM, Wuyts FL, De Bodt M, Van Cauwenberge P. Nasometric values for normal nasal resonance in the speech of young Flemish adults. The Cleft Palate-Craniofacial Journal 2001 Mar; 38(2):112-8
8. Prathanee B, Thanaviratananich S, Pongjunyakul A, Rengpatanakij K. Nasalance scores for speech in normal Thai children. Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery 2003 Jan 1; 37(6):351-5
9. Fletcher SG. Cleft palate speech assessment through oral nasal acoustic measures. Communicative disorders related to cleft lip and palate. 1989; 246-57
10. Rodger M. Dalston, Gary S. Neiman, Gonzalo Gonzalez-Landa,. Nasometric Sensitivity and Specificity: A Cross-Dialect and CrossCulture Study. The Cleft Palate-Craniofacial Journal 1993,30(3):285-91
11. Vallino-Napoli LD, Montgomery AA. Examination of the standard deviation of mean nasalance scores in subjects with cleft palate: implications for clinical use. The Cleft Palate-Craniofacial Journal 1997 Nov; 34(6):512-9
12. Kalyani M, Sinha A.K., Kumar H, Hota BP, Das L. Influence of Mizo Language on Nasal and Oral Passage In English: A Nasometric Study. Asia Pacific Journal of Research. 2016;1
13. Haapanen ML. Nasalance scores in normal Finnish speech. Folia Phoniatrica et Logopaedica 1991; 43(4):197-203
14. Tachimura T, Mori C, Hirata SI, Wada T. Nasalance score variation in normal adult Japanese speakers of Mid-West Japanese dialect. The Cleft Palate-Craniofacial Journal 2000 Sep; 37(5):463-7
15. Fletcher SG. Contingencies for bioelectronic modification of nasality. Journal of Speech and Hearing Disorders 1972 Aug; 37(3):329-46
16. Fairbanks G. Voice and articulation drillbook. New York: Harper & Row; 1960
17. Fletcher SG, Sooudi I, Frost SD. Quantitative and graphic analysis of prosthetic treatment for “nasalance” in speech. The Journal of Prosthetic Dentistry. 1974 Sep 1; 32(3):284-91
18. Rabel, Lili.1961. Khasi Language of Assam. Baton Rouge, La: Louisiana State Press
19. Anthea I. Britto, Philip C. Doyle. A Comparison of Habitual and Derived Optimal Voice Fundamental Frequency Values in Normal Young Adult Speakers. Journal of Speech Hearing Disorder 1990; 55(3):476
20. Holmberg EB, Oates J, Dacakis G, Grant C . Phonetograms, aerodynamic measurements, self-evaluations, and auditory perceptual ratings of male-to-female transsexual voice. Journal of Voice 2010 Sep 1; 24(5):511-22.
21. Holmberg EB, Oates J, Dacakis G, Grant C . Phonetograms, aerodynamic measurements, self-evaluations, and auditory perceptual ratings of male-to-female transsexual voice. Journal of Voice 2010 Sep 1; 24(5):511-22.

A Clinical Study of Serum Vitamin D Levels in Chronic Tonsillitis among Paediatric Age Group

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ABSTRACT

Introduction

Infectious diseases of the faucial tonsils are most frequently encountered by Oto-rhino-laryngologists. Vitamin D has got an important role in the production of surface Anti-microbial peptides (AMPs). Overall, the active form of vitamin D plays a vital role in maintaining the immune system of the body. This study aims to evaluate the association of vitamin D deficiency in chronic tonsillitis among paediatric age group.

Materials And Methods

It is a clinical study carried out in the Department of Oto-Rhino-Laryngology and Head and Neck Surgery at a medical college in Ballari, Karnataka, India from January 2018 to January 2019 for the time period of 12 months. Patients were evaluated with the relevant investigations and digital X-ray nasopharynx along with serum Vitamin D level assessment.

Result

A total of 60 children with chronic tonsillitis were enrolled in this study. There were 26(43.3%) male children and 34(56.7%) females, ranging in age group from 5 to15 years, mean age is 9.82. The common clinical presentation was recurrent episodes of throat pain seen in all the patients (100%). On serum 25-hydroxyvitamin D assessment, 40(66.7%) patients were found to have deficiency and 20(33.3%) patients were having insufficiency. Mean is 17.99ng/ml and ranging from 9.13-28.58ng/ml.

Conclusion

The study concludes that, the serum vitamin D levels in chronic tonsillitis among the paediatric age groups is found to be below normal levels and is unrelated to the socio demographic factors.

Keywords

Vitamin D, Tonsillitis.

Faucial tonsils are the important constituents of the inner Waldeyer's ring and the specialized lymphoid organs of upper respiratory tract. Infectious diseases of these are most frequently encountered by the Oto-rhino-laryngologists.[1] Chronic tonsillitis is the leading cause of frequent hospital visit during childhood in the form of recurrent sore throat.[2] Exact cause for chronic tonsillitis has not been identified yet but major contributory factors are incompliance of the patient to treatment, early stoppage of antibiotics, inadequate absorption of antibiotics, antibiotic resistance, bacterial load, bacterial biofilms and immune system deficiencies.[3] Chronic tonsillitis is the major reason for the tonsillectomies, and this is associated with significant morbidities and very rarely mortality. Alternative treatment for recurrent or chronic tonsillitis is repeated antibiotic course.[4]

The macrophages located in the crypts of faucial tonsils, plays a crucial role in recognizing the airborne antigens.[5] Antigens are taken up by the epithelial cells in crypts, these are engulfed by the Toll-like receptors (TLR) which are located on the macrophages.[6] Structurally pathogens are different from the eukaryotes and this is recognised by TLR, in recurrent tonsillitis TLR's shows variability in its expression.[7] Vitamin D receptor gene and vitamin D hydroxylase are necessary for the synthesis of vitamin D, activation of TLR has been shown to cause increased

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expression of these.[8] Recognition of the pathogen, will lead to synthesis of 1,25-dihydroxyvitamin D inside the macrophage using the extracellular 25- hydroxyvitamin D taken by endocytosis.[9] The VDR gene located on 12q13.1 gene locus encodes Vitamin D receptor (VDR).[10] VDR gene shows polymorphism and Apa1, Fok1, Taq1 are the frequently studied polymorphisms.[11] The endogen defensin gene is stimulated by binding endogenously synthesized 1,25-dihydroxyvitamin D to VDR which increases cathelicidin synthesis, it has direct antimicrobial activity on the bacteria and viruses.[12] While functions of macrophage like chemotaxis, phagocytosis and bactericidal effect are augmented by vitamin D3.[12] Anti-microbial peptides(AMPs) plays a vital role in the innate immunity, Vitamin D has got important role in production of this surface AMPs.[13] Overall active form of vitamin D plays a vital role in maintaining the immune system of the body.[14] This study assessed the vitamin D levels in chronic tonsillitis to find the association between the Vitamin D deficiency and chronic tonsillitis in paediatric age group.

Materials and Methods

It is a clinical study carried out from January 2018 to January 2019 for the time period of 12 months. Our study sample is 60 and simple random sampling method is used. Children between 5 year to 15 years of age fulfilling the Paradise et al. criteria of chronic tonsillitis and who are not on any vitamin D supplementation were included in the study. Syndromic children or children with chronic systemic disease or those suffering from malnutrition or obesity or any other nutritional problems were excluded from the study. Children were also excluded if their parents refused their children to participate in the study.

Measurement of serum vitamin D level

In this study serum levels of 25-hydroxyvitamin D is assessed, as it is accepted as a reference for determination of vitamin D level in literature due to its long serum half time. As per Endocrine society guidelines, vitamin D status is categorized as deficiency below 20 ng/ml(50nmol/L), insufficiency 21-29 ng/ml (52.5-72.5 nmol/L), sufficiency 30-100 ng/ml (75-250 nmol/L) respectively.[15] Even though this is accepted widely, as most of the world's population is found to have vitamin D deficiency, extensive efforts are being made to interpret the basis for this criteria.[16] Friedman and Brodsky tonsillar enlargement grading system was used.[17]

All patient's parents/guardian were informed about the study and written consent was obtained. The study protocol was approved by the institutional ethical committee. Patients were evaluated with all other relevant investigations and digital X-ray nasopharynx along with serum Vitamin D level assessment. The data is subjected for statistical analysis and P value <0.05 considered as significant.

Results

A total of 60 children with chronic tonsillitis were enrolled in this study, who met the participation criteria. There were 26(43.3%) males and 34(56.7%) females, ranging in age group from 5 to 15 years, mean age being 9.82 years. 37(61.7%) patients from study population are between 5 to 10 years and 23(38.3%) are between 11 to 15 years. 39(65 %) children were from rural area and 21(35%) were from urban. (Table I)

The common clinical presentations were recurrent episodes of throat pain seen in 60(100%), difficulty in swallowing in 36(60%), pain during swallowing in 26(43.3%), snoring in 43(71.7%), mouth breathing in 44(73.3%), fever in 18(30%) and coryza in 6(10%).

On clinical examination, the assessment of tonsillar enlargement was done using Friedman and Brodsky grading scale. Grade 1 was seen in 1(1.7%), grade 2 in 14(23.3%), grade 3 in 42(70 %) and grade 4 in 3(5%) of study population. Neck was examined for lymph node enlargement, in 22(36.7%) patients no nodes were palpable, in 28(46.7%) patients bilateral jugulodigastric lymph nodes were enlarged, in 8(13.3%) left side and in 2(3.3%) patients right-side lymph nodes were enlarged. (Table II) On radiographic examination of nasopharynx, adenoid enlargement was seen in 48(80%) patients. (Table III) On serum 25-hydroxyvitamin D assessment 40(66.7%) patients were found to have vitamin D

deficiency, 20(33.3%) patients were having insufficient vitamin D, mean is 17.99 ng/ml, minimum level is 9.13 ng/ml, maximum is 28.58 ng/ml and range is 9.13-28.58ng/ml.

All 60 patient's vitamin D levels were below normal range as per Endocrine society guidelines. Mean Serum 25 hydroxyvitamin D in females is 17.05 ng/ml and in males is 19.23 ng/ml. Mean Serum 25 hydroxyvitamin D in 5 to 10 years of patients is18.60 ng/ml and in 11 to 15 years of patients is 17.04 ng/ml. On comparison of serum 25 hydroxyvitamin D levels with Sociodemographic factors, in 25(63%) females and 15(38%) males had deficiency and 9(45%) females and 11(55%) males had insufficiency respectively. Gender and vitamin D levels were independent [P-0.197, (>0.05)]. In 22(36.7%) patients from 5 to 10 years, 18(30%) patients from 11 to 15 years of age group had deficiency, and 15(75%) patients from 5 to 10 years, 5(25%) patients from 11 to 15 years of age group had insufficiency. Age and vitamin D levels were independent [P-0.274, (>0.05)]. In 24(60%) patients of rural and 16(40%) patients of urban residents had deficiency, and 15(75%) patients of rural and 5(25%) patients of urban residents had insufficiency. Serum vitamin D is also not dependant on place of residency i.e., rural or urban background [P-0.251, (>0.05)]. (Table I)

On comparison of serum 25 hydroxyvitamin D levels with the tonsillar enlargement grade, 1(2.5%), 10(25%), 28(70%), 1(2.5%) of grade's 1,2,3,4 respectively had deficiency, and 4(20%),14(70%), 2(10%) of grade 2,3,4 respectively had insufficiency. Tonsillar enlargement grade and serum vitamin D is also not statistically significant [P-0.543, (>0.05)]. (Table IV) On comparison of serum 25 hydroxyvitamin D levels with the adenoid hypertrophy, 34(85%) patients with adenoid hypertrophy, 6(15%) patients without adenoid hypertrophy had deficiency, 14(70%) patients with adenoid hypertrophy, 6(30%) patients without adenoid hypertrophy had insufficiency. Adenoid hypertrophy and serum vitamin D have no correlations [P-0.171, (>0.05)]. (Table III) On comparison of serum 25 hydroxyvitamin D levels with the neck lymph nodes enlargement, in 19(47.5%) patients bilateral level 2, 4(10%) patients left side level 2, 2(5%) patients right side level 2 and 15(37.5%) patients without any neck lymph nodes enlargement had deficiency and 9(45%) patients bilateral level 2, 4(20%) patients left side level 2 and 7(35%) patients without any neck lymph nodes enlargement had insufficiency, neck node enlargement and vit D levels are also not statistically related [P-0.564, (>0.05)].(Table II) Age and duration of the symptoms has positive correlation, Pearson Correlation= 0.187. (Table V)

Discussion

Vitamins are organic chemical compounds which can be synthesized by the body, sometimes it must be provided through dietary supplements. Among fat soluble vitamins, vitamin D has got unique characteristics in the body.[18] Vitamin D deficiency is associated with several diseases like autoimmune diseases, cardiovascular diseases, upper respiratory infection.[3] Vitamin D has got crucial role in maintaining adaptive immunity.[4] Several studies have shown the association between Vitamin D levels and recurrent tonsillitis,[4] adenotonsillar hypertrophy,[19] tonsillopharyngitis,[11] otitis media with effusion.[19] Factors which influences the vitamin D levels in children are maternal factors, environmental factors, dietary factors, exposure to sunlight, regional clothing habits.[11,20]

Serum 25 hydroxyvitamin D half-life is 20 days and is the best parameter for evaluation of vitamin D levels. 1,25(OH)2 vitamin D is active form, whose half-life is 3 to 6 hours, circulating levels are very low as compared to 25 hydroxyvitamin D, so it is not usually preferred for estimation of vitamin D levels. In our study we have estimated the levels of 25 hydroxyvitamin D due to the ease in estimation by enzyme-linked immunosorbent assay (ELISA) method, it gives both information on body storage of vitamin D as well as biologically active form of vitamin D.

In our study vitamin D levels was assessed using currently categorized vitamin D levels by endocrine society guidelines.[16] Even though Alladi et al., Asghari et al., Ayidin et al., and the other authors and organisations vary with this levels.[12,19,21] Endocrine society guidelines for vitamin D levels are most widely accepted one.[3,11,15,16] Extensive efforts are being made to interpret the basis of

Table I: Statistical data on sociodemographic factors & Vit D Levels

SOCIODEMOGRAPHIC FACTORS		TOTAL		VIT D LEVELS (NG/ML)		CHI SQUARE TEST	
		FREQUENCY	PERCENT (%)	DEFICIENCY (≤ 20)	INSUFFICIENCY (21 -29)	P VALUE	SIGNIFI-CANCE
Age (In Years)	5-10	37	61.7	22	15	P<0.274 (>0.05)	Not Significant
	11-15	23	38.3	18	5		
Gender	Male	26	43.3	15	11	P<0.197 (>0.05)	Not Significant
	Female	34	56.7	25	9		
Place	Rural	39	65	24	15	P<0.251 (>0.05)	Not Significant
	Urban	21	35	16	5		

Table II: Statistical analysis of neck lymph node enlargement with serum 25 hydroxyvitamin D levels in chronic tonsillitis patients

NECK (LYMPH NODE ENLARGEMENT)	FREQUENCY	PERCENT (%)	VIT D LEVELS (NG/ML)		CHI SQUARE TEST	
			DEFICIENCY (≤ 20)	INSUFFICIENCY (21 -29)	P VALUE	SIGNIFI-CANCE
No enlargement	22	36.7	15	7	P<0.564 (>0.05)	Not significant
Bilateral level 2	28	46.7	19	9		
Left level 2	8	13.3	4	4		
Right level 2	2	3.3	2	0		

Table III: Statistical data of adenoid hypertrophy on digital X-ray examination versus serum 25 hydroxyvitamin D levels

RADIOGRAPHIC EXAMINATION OF NASOPHARYNX	VIT D LEVELS (NG/ML)		CHI SQUARE TEST	
	DEFICIENCY (≤ 20)	INSUFFICIENCY (21 -29)	P VALUE	SIGNIFICANCE
Adenoid Hypertrophy	34	14	P<0.171 (>0.05)	Not Significant
No abnormality detected	6	6		

Table IV: Statistical analysis of serum 25 hydroxyvitamin D levels with the tonsillar enlargement grade

		DEFICIENCY		INSUFFICIENCY		P	INFERENCE
		FREQUENCY	PERCENT (%)	FREQUENCY	PERCENT (%)		
Oropharynx (Tonsillar enlargement grade)	1	1	2.5	0	0	0.543 (>0.05)	Not significant
	2	10	25	4	20		
	3	28	70	14	70		
	4	1	2.5	2	10		
	Total	40	100	20	100		

this criteria.[16]

A study conducted by Selvarajan et al. to review the vitamin D levels in Indian population concludes that, vitamin D deficiency is prevalent among apparently healthy Indians living in different regions of the country and is not dependent on age, gender, menopausal status, residence of the individuals.[16]

Reference values needs to be interpreted to an appropriate manner and vitamin D deficiency need not to be considered pandemic and unnecessary screening should be evaded and it should be done for high risk individuals, further studies are needed to establish the normal value for serum 25 OH vitamin D levels in Indian population.[16]

We have studied, the association between serum vitamin D levels and chronic tonsillitis, with the existing controversy regarding vitamin D levels, in the midst of current scientific criteria we have found out that all the children with chronic tonsillitis have, serum vitamin D below normal levels. 66.7% are deficient and 33.3% has got insufficient levels. It is similar to the study conducted by Elbistanlı et al.[13] There is no relation between the age, gender and site of residence to explain the low levels of vitamin D, which is similar to the study conducted by Albana et al.[22] and Alladi et al.[21] which showed no significant relation between socio demographic variables, in another study conducted by Elbistanlı et al.[13], they concluded that young age and low levels of vitamin D increased the incidence of upper respiratory tract infection(URTI).

Table V: Age wise correlation with duration of symptoms and serum vitamin D levels

		DURATION OF SYMPTOMS	SERUM VITAMIN D
Age (Years)	Pearson Correlation	0.187	-0.271
	P	0.154	0.036
	Inference	Positive correlation	Negative correlation

There is a positive correlation between age and duration of the symptoms which is invariably related to the chronicity of the disease. We didn't find any relationship between tonsillar size, adenoid hypertrophy, neck node enlargement and serum vitamin D levels. In contrary to our study, Reid et al. found that low vitamin D levels were associated with dark skin, high body mass index, large tonsil size.[4]

Now the question is, whether adding supplementation of vitamin D will reduce the incidence of Chronic tonsillitis? In randomised controlled studies vitamin D supplementation was shown to reduce the incidence of URTI.[13] On the contrary, Robertson et al. reported that there was no relationship between vitamin D levels and URTI and they have concluded that vitamin D

supplementation didn't reduce the incidence of URTI's in the Norwegian population.[23]

An ideal study should encompass vitamin D level measurements at the same seasonal period.[24] The logic behind measurement of seasonal changes of serum vitamin D levels is exposure to sunlight in winter season is very less compared to summer seasons. A study conducted by Khan et al.[25] and Alladi et al.[21]) showed that vitamin D deficiency is more common in children who were not exposed to sunlight.

Further studies with large sample size are needed to investigate the relationship between dietary habits, clothing habits, sunlight exposure, use of sunscreen and relationship between the frequency of tonsillitis during seasonal variation.

Conclusion

In the midst of current scientific criteria of the serum vitamin D levels, with regards to the cut off values to define the deficiency/insufficiency among the paediatric age groups, this study concludes that the serum vitamin D levels in chronic tonsillitis among the paediatric age groups is found to be below normal levels and is unrelated to the socio demographic factors.

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References

1. Somuk BT, Sapmaz E, Soyaliç H, Yamanoğlu M, Mendil D, Arici A, et al. Evaluation of iron and zinc levels in recurrent tonsillitis and tonsillar hypertrophy. Am J Otolaryngol - Head Neck Med Surg [Internet]. 2016;37(2):116-9. Available from: http://dx.doi.org/10.1016/j.amjoto.2015.11.002
2. Paradise JL, Bluestone CD, Colborn DK, Bernard BS, Rockette HE, Kurs-Lasky M. Tonsillectomy and adenotonsillectomy for recurrent throat infection in moderately affected children. Pediatrics. 2002;Jul:110(1 Pt 1):7-15
3. Nseir W, Mograbi J, Abu-Rahmeh Z, Mahamid M, Abu-Elheja O, Shalata A. The association between vitamin D levels and recurrent group A streptococcal tonsillopharyngitis in adults. Int J Infect Dis [Internet]. 2012;16(10):e735-8. Available from: http://dx.doi.org/10.1016/j.ijid.2012.05.1036
4. Reid D, Morton R, Salkeld L, Bartley J. Vitamin D and tonsil disease - Preliminary observations. Int J Pediatr Otorhinolaryngol [Internet]. 2011;75(2):261-4. Available from: http://dx.doi.org/10.1016/j.ijporl.2010.11.012
5. Nave H, Gebert A, Pabst R. Morphology and immunology of the human palatine tonsil. Anat Embryol (Berl). 2001;Nov;204(5):367-73
6. Lange MJ, Lasiter JC, Misfeldt ML. Toll-like receptors in tonsillar epithelial cells. Int J Pediatr Otorhinolaryngol. 2009; 73(4):613-21
7. Mansson A, Adner M, Cardell LO. Toll-like receptors in cellular subsets of human tonsil T cells: Altered expression during recurrent tonsillitis. Respir Res. 2006; 27(7):36
8. Liu PT, Stenger S, Li H, Wenzel L, Tan BH, Krutzik SR, et al. Toll-like receptor triggering of a vitamin D-mediated human antimicrobial response. Science 2006;Mar 24; 311(5768):1770-3
9. Adams JS, Liu PT, Chun R, Modlin RL, Hewison M. Vitamin D in defense of the human immune response. Ann N Y Acad Sci. 2007; 1117:94-105
10. Uitterlinden AG, Fang Y, Van Meurs JBJ, Van Leeuwen H, Pols HAP. Vitamin D receptor gene polymorphisms in relation to Vitamin D related disease states. J Steroid Biochem Mol Biol. 2004; 89-90(1-5):187-93
11. Yildiz I, Unuvar E, Zeybek U, Toptas B, Cacina C, Toprak S, et al. The role of vitamin D in children with recurrent Tonsillopharyngitis. Ital J Pediatr. 2012; 38(1):25
12. Aydin S, Aslan I, Yildiz I, Aĝaçhan B, Toptaş B, Toprak S, et al. Vitamin D levels in children with recurrent tonsillitis. Int J Pediatr Otorhinolaryngol. 2011;75(3):364-7
13. Elbistanlı MS, Güneş S, Yegin Y, Çelik M, Koçak HE, Evren C, et al. Relationship Between Serum Vitamin D Levels and Childhood Recurrent Tonsillitis. Otolaryngol - Open J. 2017; 3(1):16-21
14. Canning MO, Grotenhuis K, de Wit H, Ruwholf C, Drexhage HA. 1-α,25-dihydroxyvitamin D3 (1,25(OH)2D3) hampers the maturation of fully active immature dendritic cells from monocytes. Eur J Endocrinol. 2001;145(3):351-7
15. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, et al. Evaluation, treatment, and prevention of vitamin D deficiency: An endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2011; 96(7):1911-30
16. Selvarajan S, Gunaseelan V, Anandabaskar N, Alphienes Stanley Xavier SS et al. Systematic review on Vit D levels in apparently healthy indian population and analysis of its associated factors. Indian J Endocrinol Metab [Internet].

2017;21(5):765-75. Available from: http://www.ijem.in

17. Powell S. Paeditric obstructive sleep apnoea. In: Watkinson John C, Editor. Scott-Brown's Otorhinolaryngology Head & Neck Surgery. Eighth Ed. CRC; 2018. Vol. 2; p293-309
18. Kazi MY, Aamir K, Rana MN, Farooq MA. Frequency of Vitamin D3Deficiency in Children Presenting With Frequent Sino-Pulmonary Infections. Pakistan Paediatr J. 2013; 37(2):101-5
19. Asghari A, Bagheri Z, Jalessi M, Salem MM et al. Vitamin D levels in children with adenotonsillar hypertrophy and Otitis media with effusion. Iran J Otorhinolaryngol. 2017; 29(1):29-33
20. Collak A. Serum vitamin D levels in children with recurrent tonsillopharyngitis. North Clin Istanbul. 2014;1(1):13-8
21. Alladi YR, Gopal J. Vitamin D Deficiency and Relation to Recurrent Respiratory Tract Infection in children less than 5 years. J Dent Med Sci. 2017; 16(8):88-96
22. Albanna EA, Ali YF, Am R, Moneim EA. Vitamin D and LL-37 in children with pneumonia Correspondence. Egypt J Pediatr Allergy Immunology 2010; 8(2):81-6
23. Robertsen S, Grimnes G, Melbye H. Association between serum 25-hydroxyvitamin D concentration and symptoms of respiratory tract infection in a Norwegian population: The Tromso Study. Public Health Nutr. 2014; 17(4):780-6
24. Nair R, Maseeh A. Vitamin D: the sunshine vitamin. J Pharmacol Pharmacother [Internet] 2012; 3(2):118–26. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22629085
25. Haider N, Nagi AG, Khan KM. Frequency nutritional rickets in children admitted with severe pneumonia. J Pak Med Assoc. 60(9):729-32.

Varied Presentations of Non-Hodgkin Lymphoma in Head and Neck Region

Chiranjib Das,[1] Pritam Chatterjee[2]

ABSTRACT

Introduction

Majority of lymphomas involving the head and neck are Non-Hodgkin lymphoma (NHL). Most of them present as cervical lymphadenopathy. The objectives of this study are to present the problems encountered in the diagnosis of extra-nodal NHL in head and neck region and show the importance of thorough clinical examination and proper investigation.

Materials And Methods

A prospective study was done in the department of ENT in a tertiary care hospital of West Bengal from July 2015 to June 2018. Patients diagnosed as NHL on the basis of histopathology and immunohistochemistry were included in this study. Patients who were lost in follow up were excluded from the study. Patients were treated with chemotherapy and radiotherapy by Oncologist. All patients were followed up routinely both by Otorhinolaryngologist and Oncologist.

Result

There were 26 male and 11 female patients in this study. Patients were between 22 years to 76 years of age with highest incidence in 6th decade of life. Patients presented with only cervical lymphadenopathy; asymmetrical tonsillar enlargement with cervical lymphadenopathy; unilateral tonsillar enlargement only; huge inta-oral mass with stridor; parotid gland swelling; thyroid swelling with multiple cervical lymphadenopathy; epistaxis, palatal ulcer and cheek swelling; severe trismus with inconspicuous retro-mandibular mass. Majority of patients did well with chemoradiotherapy. Two patients succumbed to death, one with huge intra-oral NHL and another with nasal T/NK-cell lymphoma.

Conclusion

Good knowledge of the clinical characteristics of extra-nodal NHL and the methods to establish the diagnosis are essential for a correct and timely therapy of the disease.

Keywords

Lymphoma, Non-Hodgkin; Head and Neck.

Lymphoma is the second most common neoplasm in head and neck region after squamous cell carcinoma.[1] The majority of lymphomas involving the head and neck are Non-Hodgkin's lymphomas (NHL).[2] The incidence of NHL has increased up to 35% in the last 20 years with variation in between different countries.[3] Most of the NHLs in head and neck region present as cervical lymphadenopathy. But many of them start inside throat especially in the Waldeyer's ring.[4] NHL in nose, salivary glands, thyroid and larynx are very rare.[5]

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The objectives of this study are to present the problems encountered in the diagnosis of extra-nodal NHL in head and neck region and show the importance of thorough clinical examination and proper investigation.

Materials and Methods

A prospective study was done in the department of ENT in a tertiary care hospital of West Bengal from July 2015 to June 2018. Patients diagnosed as NHL on the basis of histopathology and immunohistochemistry were included in this study. Patients who were lost in follow up were excluded from the study. After taking proper history, a thorough clinical examination of ear, nose, throat and lympho-reticular system was done. Diagnostic nasal endoscopy and fibre-optic laryngoscopy were done in all patients. Routine haematological tests,

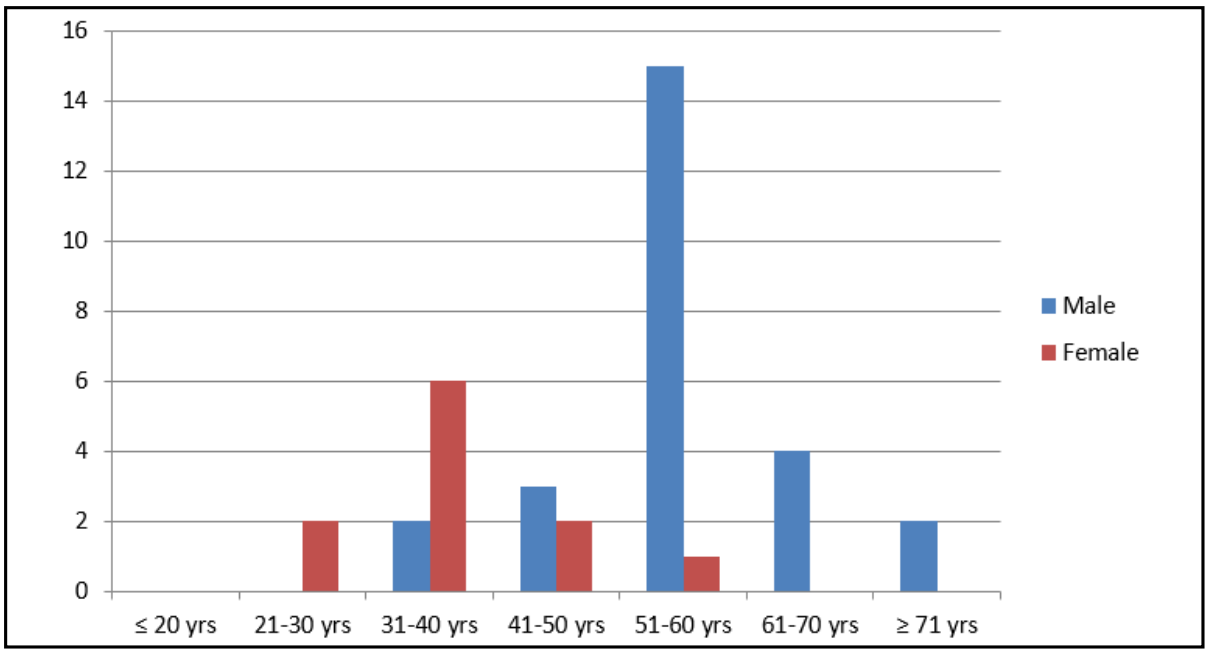

Table I: Distribution of patients according to age and sex

digital chest X-ray, USG whole abdomen were done in all patients. CECT of nose and paranasal sinuses, oral cavity, neck, thorax and abdomen were done whichever was indicated in a particular case. Biopsy was taken in adequate amount meticulously from the involved site and was sent for histopathological examination and immunohistochemistry. Thorough clinical information was given to the pathologist. Repetitive biopsy was needed in some patients to establish a diagnosis. Once the diagnosis of NHL was established, patients were treated with chemotherapy and radiotherapy by Oncologist. All patients were followed up routinely both by ENT surgeon and Oncologist.

Results

Total 37 patients were diagnosed as NHL in head and neck region over 3 years in the present study. Among them 26 were male and 11 were female. Patients were between 22 years to 76 years of age with highest incidence in 6th decade of life (Table I). 21 out of 37 patients presented with only cervical lymphadenopathy (Table II). 12 patients presented with asymmetrical tonsillar enlargement with cervical lymphadenopathy (Fig. 1). Four patients presented with unilateral tonsillar enlargement only (Fig. 2). Most of them were diagnosed with punch biopsy from tonsil. Only two patients needed tonsillectomy to prove the diagnosis. One patient presented with huge mass inside oral cavity, dysphagia, respiratory distress and stridor (Fig. 3).

Emergency tracheostomy was done followed by wedge biopsy from intra-oral mass. One patient presented with swelling of right parotid gland (Fig. 4). One patient presented with solitary nodule in right lobe of thyroid with multiple cervical lymphadenopathy, huge swelling over sternum, multiple soft tissue nodules in both kidneys and multiple parietal swelling (Fig. 5). One patient presented with recurrent epistaxis, palatal ulcer and swelling over right cheek (Fig. 6).

Histopathogical report of the tissue from nasal cavity was inconclusive. Immunohistochemistry established the diagnosis as T/NK-cell lymphoma. One patient presented with severe trismus without any obvious cause (Fig. 7). On CECT oral cavity, a small heterogenous mass was noticed in right retro-mandibular region. Incision biopsy from the mass established the diagnosis of NHL. Majority of patients did well with chemoradiotherapy. Two patients succumbed to death, one with huge intra-oral NHL and another with nasal T/NK-cell lymphoma.

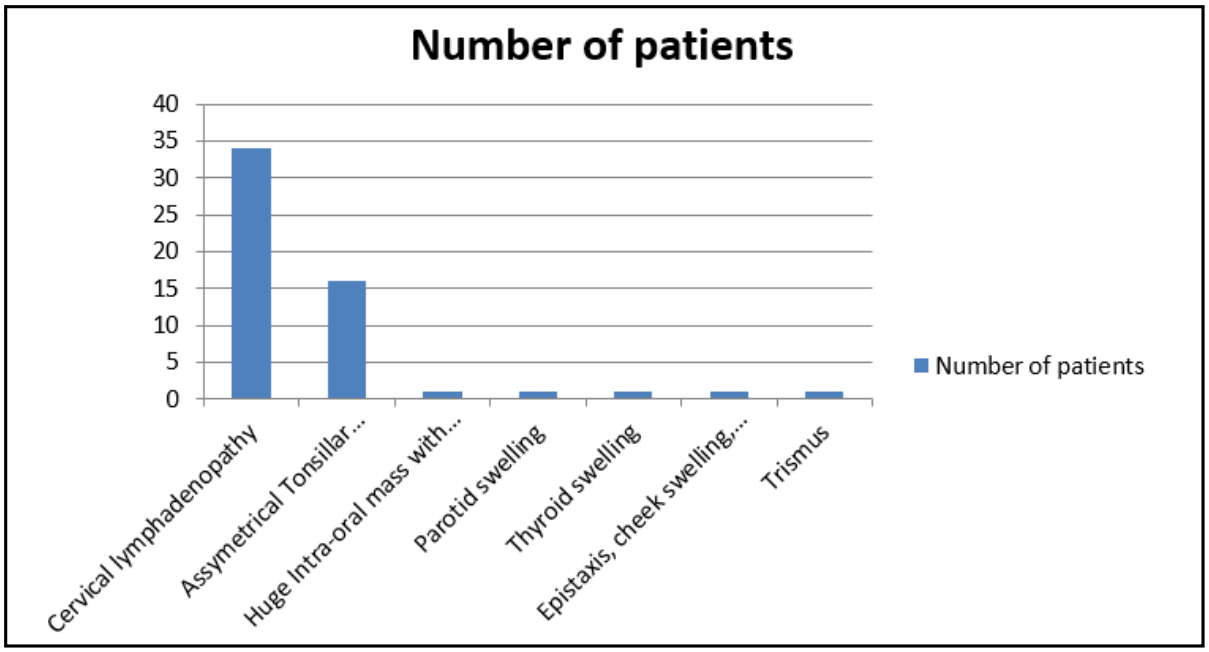

Table II: Distribution of patients according to presentation

Fig. 1. (a) Clinical photograph showing left tonsillar swelling. (b) CECT neck axial section and (c) CECT neck coronal section showing enlarged cervical lymph node along with left tonsillar swelling.

Fig. 2. (a) Clinical photograph showing left tonsillar swelling. (b) CECT neck coronal section and (c) CECT neck axial section showing left tonsillar swelling. (d) Post-treatment clinical photograph showing complete

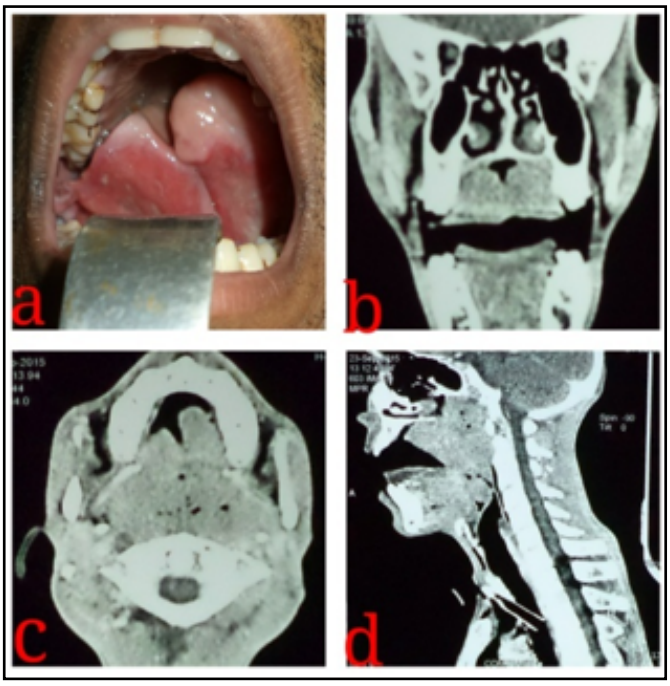

Fig. 3. (a) Clinical photograph showing huge intra-oral mass. (b) CECT nose, PNS and oral cavity coronal section, (c) CECT neck axial section and (d) CECT neck sagittal section showing huge mass occupying nasopharynx, oropharynx and oral cavity extwnding to parapharyngeal spaces with tracheostomy tube in situ.

Discussion

Lymphomas are malignant neoplasms of lymphocytes and their precursors.[6] Until 1990, different classifications were used. In 1994 a new classification was implemented called REAL (Revised European American Lymphoma Classification). Based on this, the current WHO classification was developed and is generally used.[7] Approximately 10% of lymphomas are Hodgkin lymphoma (HL) and 90% are Non-Hodgkin lymphoma (NHL).[3] NHLs usually develop in lymph nodes. But about one third of the NHLs are extra-nodal.[8] Head and neck is the second most common region for the extra-nodal lymphomas after gastrointestinal tract.[9] About 10% of extra- nodal lymphomas are seen in the head and neck region.[10] The localization of this tumour reveals tonsil to be the most common, followed by nasopharynx, oral cavity, salivary glands, paranasal sinuses and base of tongue.[9]

Fig. 4: Clinical photograph showing swelling of right parotid gland.

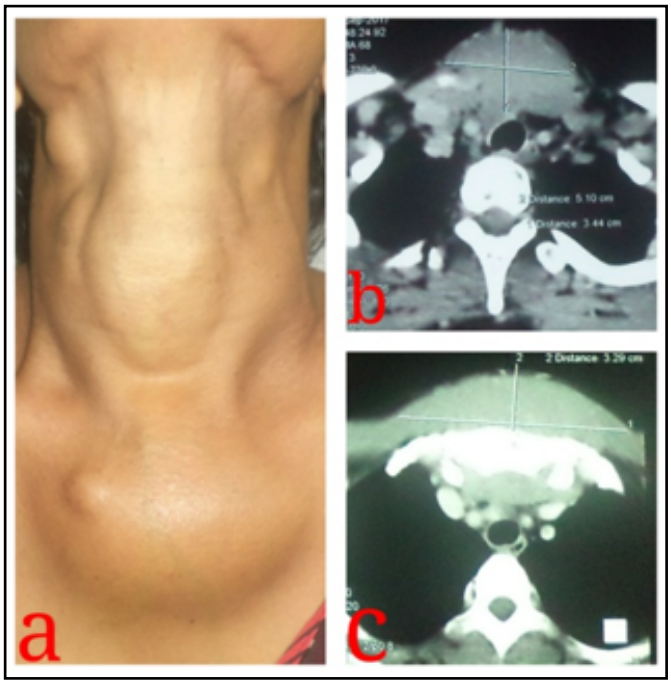

Fig. 5. (a) Clinical photograph showing thyroid swelling, cervical lymphadenopathy and swelling over sternum. (b) CECT neck axial section showing enlarged right lobe of thyroid with ill-defined non-enhancing hypodense SOL (c) CECT thorax axial section showing swelling over sternum.

Fig. 6. (a) Clinical photograph showing swelling over right cheek (b) clinical photograph showing palatal ulcer in midline eroding underlying bone. (c) CECT nose and PNS showing destruction of hard palate and right inferior turbinate with mild soft tissue opacity in right nasal cavity and right maxillary sinus.

Fig. 7. (a) Clinical photograph showing severe trismus. (b) Clinical photograph showing scar mark of biopsy from inconspicuous retro-mandibular swelling.

The distribution of the age in this study is in accordance with the literature.3 with most patients being older than 50 years (22 out of 37 patients). Usually NHLs of the head and neck region occur more often in men, with approximately 55-77% of cases which is similar in the present study (70.27%).[11] Diagnosis includes a combination of physical examination, blood tests, diagnostic imaging and selective biopsies. Unfortunately the symptoms of NHLs are not specific. Swelling of the area involved and absence of pain are the two signs and symptoms most often described. Systemic signs and symptoms (fever of unknown origin, inexplicable weight loss and night sweating) are usually more often described in patients with Hodgkin's lymphoma than with Non-Hodgkin lymphoma.[12]

Majority of the head and neck extra-nodal NHLs occur in the Waldeyers ring (ie, the tonsils, nasopharynx and the base of the tongue).[9] 40% to 50% of them arise in the palatine tonsil. Tonsillar lymphomas occur mostly in elderly males and present with sore throat, unilateral tonsillar enlargement, cervical lymphadenopathy or dysphagia.[6] It can easily be mistaken for tonsillitis. Thus, by the time a biopsy is taken, the lymphoma may already be in an advanced, incurable stage.[13] 67% to 96% of primary tonsillar NHLs are of diffuse large B-cell type (DLBCL).[9] All patients with tonsillar NHL in this study were of DLBCL type.

The vast majority of lymphomas of salivary glands are located in the parotid.[14] The patient in this series had low grade B-cell lymphoma of MALT type in right parotid gland. However, the true incidence of primary lymphomas of the salivary glands is difficult to estimate because of the presence of intra-parotid lymph nodes from which nodal lymphomas may arise, despite classification as extranodal.[14]

Lymphoma of the thyroid may either originate in situ or affect the thyroid secondarily as a manifestation of systemic disease. Primary lymphoma of the thyroid

gland represents 2-5% of extra-nodal NHLs. Secondary involvement seen in 20% dying of generalized lymphoma. Regional lymph node enlargement can be seen in some cases.[15,16] The patient in this study had NHL involving multiple organs that are thyroid, lymph nodes, kidneys.

Primary lymphoma of the nose and paranasal sinuses is very difficult to recognize both clinically and pathologically. These lymphomas appear to be exceedingly rare in Western countries, where they usually show a B-cell phenotype, but relatively common among Asians and Native Americans of Central and South America. Indeed, in Asian countries they represent the second largest group of extra-nodal lymphomas after GI localizations, and most of them have T/NK-cell phenotype. Affected patients generally present with nasal obstruction, rhinorrhea or epistaxis. Later on it causes disfigurement, as the nasal bones are eroded. Patients present with destructive nasal or midline facial lesion, erythema, oedema and swelling. This category of lymphoma has been referred to in the past as lethal midline granuloma and, more recently, as angiocentric T/NK-cell nasal lymphoma. Differential diagnosis includes nonspecific sinusitis, rhinitis and Wegener's granulomatosis.[17] In the present study histopathological examination could not make a definitive diagnosis. Only immunohistochemistry could establish it to be nasal T/NK-cell lymphoma.

It may be clinically impossible to distinguish the origin of the tumour based on the localization of first symptoms. CT and MRI have greatly facilitated the definition of disease extent, even though documentation of precise margins remains difficult for some localizations (e.g., paranasal sinus, oral cavity).[18] Computed thomography (CT) of the head and neck, chest, abdomen and pelvis is the mainstay of staging for lymphoma. Bone marrow biopsy is equally mandatory for staging. Concurrent positron emission tomography (PET) with 18F-fluorodeoxyglucose (FDG) and computed tomography (PET/CT) is a useful method for staging and assessment of therapeutic response.[19]

Ambiguous results of histopathological examination should alert the physician of a potential presence of lymphoma. A study by Yen et al. emphasized the importance of repetitive biopsies containing sufficient amounts of tissue for histopathological examination. The tissue should be preserved in buffered formalin and sent to the pathologist immediately after the biopsy.[13] In case of lymph node biopsy, excision of a intact lymph node should be tried.[12] Repeated biopsy, even tonsillectomy biopsy is sometimes needed for correct diagnosis of the disease.[9] Two patients in the present study needed tonsillectomy to come to the diagnosis. Histopathologically, nasal T/NK-cell lymphoma characteristically shows a broad spectrum of cell size, associated with features of angiocentric and angiodestructive growth and extensive necrosis. In early stages, there can be a prominent inflammatory background, often causing difficulty in differentiating it from an inflammatory or infectious process. A simple punch biopsy from the nasal cavity may not yield a satisfactory amount of tissue in majority of the patients.[17]

Careful immunohistochemical assessment is vital in order to differentiate lymphomas from other malignancies as well as to recognize the type of lymphoma. The presence of positive staining for leukocyte common antigen (LCA) in histopathological specimen distinguishes malignant lymphomas from non-lymphoid neoplasms.[11] Most of lymphomas of the head and neck are aggressive B-cell lymphomas like DLBCL, followed by indolent lymphomas (MALT type and follicular lymphomas).[20]

Mutilating surgery should be avoided. The role of surgery is limited to biopsy. Definitive therapy has to be tailored to the stage and histological subtype.[21] Prognosis of nasal T/NK-cell lymphoma is usually poor.

Conclusion

Lymphomas represent approximately 5% of all malignant neoplasms of the head and neck area. The most common manifestation of NHL in head and neck region is cervical lymphadenopathy, thus making the otolaryngologists the first physicians to deal with it. Most frequent extra-nodal site is the Waldeyer's ring. Good knowledge of the clinical characteristics of these lymphomas and the methods to establish the diagnosis are essential for a correct and timely therapy of the disease.

References

1. Shindoh M, Takami T, Arisue M, Yamashita T, Saito T, Kohgo T, Notani K, Totsuka Y, Amemiya A. Comparison between submucosal (extra-nodal) and nodal non-Hodgkin's lymphoma (NHL) in the oral and maxillofacial region. J Oral Pathol Med. 1997; 26:283-9
2. Sasai K, Yamabe H, Kokubo M, et al. Head-and-neck stages I and II extranodal non-Hodgkin's lymphomas: Real classification and selection for treatment modality. Int J Radiat Oncol Biol Phys. 2000; 48:153-60
3. Shankland KR, Armitage JO, Hancock BW. Non-Hodgkin lymphoma. Lancet 2012; 380: 848-57
4. Wang CC. Primary malignant lymphoma of the oral cavity and paranasal sinuses. Radiology 1971; 100:151-3
5. Bloomfield CD, Gajl-Peczalska KJ, Frizzera G, Kersey JH, Goldman AI. Clinical utility of lymphocyte surface markers combined with the Lukes-Collins histologic classification in adult lymphoma. N Engl J Med. 1979; 301:512-8
6. Kolokotronis A, Konstantinou N, Christakis I, Papadimitriou P et al. Localized B-cell non-Hodgkin's lymphoma of oral cavity and maxillofacial region. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2005; 99:303-10
7. Swerdlow SH, Campo E, Harris NL, Jaffe ES, Pileri SA, Stein H, et al. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. Lyon: IARC; 2008
8. Budhy TI, Soenarto SD, Yaacob HB, Ngeow WC. Changing incidence of oral and maxillofacial tumours in East Java, Indonesia, 1987-1992. Part 2: Malignant tumours. Br J Oral Maxillofac Surg. 2001; 39:460-4
9. Epstein JB, Epstein JD, Le ND, Gorsky M: Characteristics of oral and paraoral malignant lymphoma: a population-based review of 361 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2001, 92:519-25
10. Weisenburger DD. Epidemiology of non-Hodgkin's lymphoma: recent findings regarding an emerging epidemic. Ann Oncol. 1994; 5(Suppl 1):19-24
11. Etemad-Moghadam S, Tirgary F, Keshavarz S, Alaeddini M. Head and neck non-Hodgkin's lymphoma: a 20-year demographic study of 381 cases. Int J Oral Maxillofac Surg. 2010; 39:869-72
12. Zapater E, Bagan JV, Carbonell F, Basterra J. Malignant lymphoma of the head and neck. Oral Diseases 2010;16: 119-28
13. Yen TT, Wang RC, Jiang RS, et al. The diagnosis of sinonasal lymphoma: a challenge for rhinologists. Eur Arch Otorhinolaryngol. 2012; 269: 1463-9
14. Harris NL. Lymphoid proliferations of the salivary glands. Am J Clin Pathol. 1999; 111 (Suppl 1): S94-103
15. Hyjek E. Isaacson PG. Primary B-cell lymphoma of the thyroid and its relationship to Hashimoto's thyroiditis. Hum Pathol. 1988; 19:1315-26
16. Anscombe AN. Wright DH. Primary malignant lymphoma of the thyroid - a tumour of mucosa-associated lymphoid tissue: Review of seventy-six cases. Histopathology 1985; 9: 81-97
17. Jaffe ES, Chan JKC, Su IJ et al. Report of the workshop on nasal and related extranodal angiocentric T/Natural Killer cell lymphomas. Definitions, differential diagnosis, and epidemiology. Am J Surg Pathol. 1996; 20: 103-11
18. Chisin R.Weber AL. Imaging of lymphoma manifestations in the extracranial head and neck region. Leuk Lymph. 1994; 12: 177-89
19. Elstrom RL, Leonard JP, Coleman M, Brown RK: Combined PET and low-dose, noncontrast CT scanning obviates the need for additional diagnostic contrast-enhanced CT scans in patients undergoing staging or restaging for lymphoma. Ann Oncol. 2008, 19(10):1770-3
20. Cortelazzo S, Rossi A, Federico M, et al. The stage modified IBI (MIPI), histology, and combined treatment influence the clinical outcome of 401 patients with primary extranodal head and neck lymphomas (PHNBCL). Blood 2005; 106: Abstract 927
21. Munro A. Lymphomas of the oral cavity and oropharynx. In Stafford N, Waldron J (eds): Management of Oral Cancer. New York: Oxford University Press 1989, 196-200.

Third Party Disability among Spouses of People with Hearing Loss

Valli Rajasekaran,[1] Preeti Rajasekaran[1]

ABSTRACT

Introduction

With increasing life expectancy globally, hearing loss has become a major issue of concern. In addition to the negative implications on the people with hearing loss, it is also found to have a significant negative impact on the communication partners especially the spouse. Understanding the impact of hearing loss on their partners can aid us in addressing these issues during rehabilitation.

Materials And Methods

A cross sectional study was conducted among 60 people who presented with hearing loss and were living with their spouse. The hearing loss was assessed using pure tone audiometry. The third party disability among the spouses was assessed by using HII-SOP questionnaire. The disability scores were calculated and correlated with the severity of hearing loss using chi square test.

Result

The hearing loss was associated with some degree of third party disability (58.3%). The degree and duration of hearing loss did not correlate with the degree of third party disability. Female significant others had more difficulty than the male significant others. However, increasing age of the spouse, longer duration of married life and presence of chronic illness in the spouse were associated with more third party disability.

Conclusion

Hearing loss causes third party disability among spouses. In addition to treating hearing loss, the health care professionals should involve the spouses in treatment and rehabilitation. This highlights the need for family centred policies in treatment of hearing loss.

Keywords

Hearing Loss; Spouses; Disability; Cross-Sectional Studies

Hearing loss is one of the neglected chronic conditions. Hearing loss is the second most common cause of disability[1] and accounts for about 4.7% of total years lived with disability.[2] About 63 million people in our country suffer from significant auditory loss.[3]

The health condition of a patient causes disability among the family members which is referred to as third party disability.[4] Hearing loss related quality of life is impaired in spouses in spite of them having no hearing deficit. The activity limitation and participation restriction experienced by spouses of people with hearing impairment can be called as third party disability according to the World Health Organisation's (WHO) International Classification of Functioning, Disability, and Health(ICF).[5]

The hearing loss of the spouse has a significant impact on them in numerous ways. The negative consequences of hearing impairment take a greater toll on the spouses than among other relatives.[6] Studies on spouses have shown that they experience embarrassment and communication breakdown in social situations in turn leading to reduced social interactions, making them more worried and anxious. The additional effort made by the spouses to communicate effectively can lead to physical exhaustion.[7] On the other hand there are also some positive effects on relationship like improved communication skills, development of more patience and better understanding of needs of people with hearing impairment.[8] Hearing loss can have significant negative

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impact on themselves and their family members. In addition to the communication problems, the need for increased emotional support and communicative assistance creates distress for the family members. The altered social and emotional health experienced by spouses can in turn add on to the disability of hearing impaired. The family members influence their health seeking behaviour and adherence to treatment or rehabilitation. The impact of hearing loss on the family members has been less studied. Understanding the changes in the physical, social and emotional health of the spouses can help us in focusing on these aspects of health as well and may help us in providing holistic care for the patients with hearing loss.

This study was done to determine the third party disability in spouses of people with hearing impairment and to correlate the severity of third party hearing disability with degree and duration of hearing loss.

Materials and Methods

A cross sectional study was done in our medical college from July 2018 and August 2018 among 60 patients who presented to ENT OPD with hearing loss, irrespective of the type of hearing loss for more than 6 months. People with more than 25 db hearing loss, age more than 18 years, who are married and living with their spouse and spouse having normal hearing were included in the study. People with cognitive impairment and spouses with self reported dementia or cognitive impairment were excluded from the study.

Data collection:

The study was conducted after clearance from the Institutional Ethics Committee in May 2018. Patients attending ENT OPD with hearing loss were explained about the procedure and purpose of the study. Volunteers who were willing to participate in the study were included in the study. The participants were explained about the purpose and the procedure of the study. Willing participants who had not come with their spouses were asked to bring them in the subsequent visit. Informed written consent was obtained both from the patient and their spouses. People who refused to give a written consent were not included in the study.

Patients who met the inclusion criteria were included the study. The basic sociodemographic details like the age, sex, education, employment, associated chronic ailments were noted in the patient information sheet. They were initially examined to rule out any underlying external and middle ear pathologies. Hearing was assessed initially with tuning fork test (512 Hz). Rinne, Weber and Absolute bone conduction test were done to clinically assess the hearing loss. Pure Tone Audiometry (PTA) was done to confirm the type and to ascertain the degree of hearing loss. Pure tone average was calculated for both ears for 500 Hz, 1000 Hz, 2000Hz and 4000Hz. Based on the audiogram the type of hearing loss was identified. WHO classification was used to calculate the degree of hearing loss.[9] The hearing loss in the better ear was taken into consideration.

The hearing status of the patient's spouse was initially assessed by doing a tuning fork test and was confirmed using pure tone audiometer. The basic sociodemographic details and associated chronic ailments were noted in the information sheet. The third party disability in the spouses was assessed using HII-SOP questionnaire.[10] The questionnaire was read out to the spouse of each patient and the response was recorded.

HII- SOP questionnaire:[10]

The questionnaire contains 20 questions related to Social Impact, Relationship and Emotional and Communication strategies with 4, 11 and 5 questions respectively. Each question has 3 possible responses: yes, sometimes or no. The responses were scored as 5, 2.5 and 0 respectively. The total disability scores and communication strategies, social impact, relation and emotion sub scores were calculated. The maximum score was 100. Scores of 20-39 were taken as mild third party disability, 40-59 as moderate third party disability and scores > 60 as severe disability.

Data analysis:

The degree of disability was calculated using the grading system given with the questionnaire. The correlation between the disability scores and the following variables in spouses was calculated- age, sex, employment,

duration of hearing loss, severity of hearing loss, duration of married life and associated chronic illness.

Statistical methods:

The collected data was analysed using SPSS.23 (Statistical package for social sciences). Correlation between the severity of disability and the above mentioned factors was derived using chi square test. Statistical significance was taken at 95% confidence interval. $P < 0.05$ will be considered as significant.

Results

The study was done on spouses of 60 people who came to ENT department with hearing loss. The mean and the standard deviation for the age of presentation for people with hearing loss was 50.4±13.78. The mean and the standard deviation for age of spouses was 50.1±13.36. The range of age distribution was 23 – 75 years for hearing impaired and that of their spouses were 25 – 72 years.

The mean and the standard deviation for third party disability scores was 31.4±20.4. The mean and the standard deviation for the communication strategy, relationship and emotional and social impact sub scores were 9.7±4.7, 15.8±12.7 and 6±5.7 respectively.

The hearing loss was found to cause some degree of third party disability (58.3%) in their spouses. (Fig. 1)

The majority of the people in the study population had a moderate hearing loss (53.3%). Majority of people with moderate, severe or profound hearing loss had no third party disability. (Table I) There was no statistically significant association between the degree of hearing loss and the third party disability scores.

The maximum people (35%) perceived severe handicap in domain involving communication where they had to get up, go near their partners to talk. There was no handicap for most of the people (78%) in domain involving relationship and emotion where they had to talk less because of partner's hearing loss.

The age of presentation of study population was distributed between 20 to 79 years. Majority of patients (92.9%) in the age group of 60- 69 years and all patients>70 years of age (100%) had no handicap. More disabilities were reported in younger age groups. There was statistically significant association between the age of the spouse and the perceived disability (p=0.0001). (Table II)

The disability perceived by the female spouses of people with hearing impairment was more than the male spouses of people with hearing impairment. There was a statistically significant difference in the perceived disability between both the sexes ($p<0.05$). (Table II)

Most of the spouses of people with hearing loss were working. There was no significant association between the employment status and the degree of disability. (Table II)

The presence of self perceived chronic illness in the spouse for more than a year was considered in the study. In this study people who had diabetes / hypertension/ chronic bronchitis / bronchial asthma were considered as people with chronic illness. The presence of such chronic illness in the spouse was associated with more severe disability. (Table II) There was statistically significant association between the presence of some chronic illness and the disability scores (p=0.0001).

As the duration of hearing loss increases the third party disability decreases. (Table II) However there is no statistically significant association between the duration of hearing loss and the disability scores.

The duration of married life was correlated with the severity of third party disability scores (Table II) Majority of the people (63.6%) experienced moderate third party disability when the duration of married life was less than 10 years. When the duration of married life was more than 40 years, there was no self perceived third party disability.

Discussion

This study was conducted among 60 people who presented with hearing loss along with their spouses. The mean age of people who presented with hearing loss was 50.4 and their spouse was 50.1. Based on the scores obtained from the questionnaire the third party disability scores were calculated. The mean total disability scores, communication strategy sub scores, relationship and

Table I: Distribution of study population based on the degree of hearing loss and third party disability scores:

DEGREE OF HEARING LOSS	N	NO THIRD PARTY	MILD THIRD PARTY	MODERATE THIRD PARTY DISABILITY	SEVERE THIRD PARTY	
Mild	15	4 (26.7%)	2 (13.3%)	6 (40%)	3(20%)	χ 2=11.964 df=9 p-0.151*
Moderate	32	11(34.5%)	9 (28.2%)	8 (25%)	4 (6.3%)	
Severe	9	8(88.9%)	1(11.1%)	0	0	
Profound	4	2 (50%)	1 (25%)	1(25%)	0	

**Fischer exact test*

Table II: Distribution of study population relating various factors with third party disability scores:

AGE	N	NO THIRD PARTY	MILD THIRD PARTY DISABILITY	MODERATE THIRD PARTY DISABILITY	SEVERE THIRD PARTY DISABILITY	
20-29YRS	3	1 (33.3%)	0	1(33.3%)	1(33.3%)	χ 2=46.968 df=15 p-0.0001*
30-39	12	0	1 (8.3%)	8 (66.7%)	3(25%)	
40-49	13	4(31%)	3(23%)	3(23%)	3(23%)	
50-59	14	3(21.4%)	9(64.4%)	1(7.1%)	1(7.1%)	
60-69	14	13(92.9%)	0	1(7.1%)	0	
70-79	4	4(100%)	0	0	0	
Sex						
Female	26	10 (38.5%)	2 (7.7%)	9(34.6%)	5(19.2%)	χ2=8.088 df=3 p-0.04
Male	34	15 (44.1%)	11(32.3%)	6(17.6%)	2(6%)	
Employment						
Working	34	13(38.3%)	5(14.7%)	11(32.3%)	5(14.7%)	"χ 2=4.151 df=3 p-0.247"
Not working	26	12(46.2%)	8(30.8%)	4(15.4%)	2(7.7%)	

**Fischer exact test*

Table II (continued)

PRESENCE OF CHRONIC ILLNESS	N	NO THIRD PARTY	MILD THIRD PARTY DISABILITY	MODERATE THIRD PARTY DISABILITY	SEVERE THIRD PARTY DISABILITY	
No associated illness	22	16(72.7%)	4(18.1%)	2(9.09%)	0	χ 2=15.388 df=3 p-0.001*
Presence of chronic illness	38	9(23.6%)	9(23.6%)	13(34.2%)	7(18.4%)	
Duration of hearing loss						
Less than 1 yr	19	4(21.1%)	4(21.1%)	7(36.7%)	4(21.1%)	χ 2=15.381 df=12 p-0.129
1-2 yrs	20	6(30%)	5(25%)	6 (30%)	3(15%)	
3-4yrs	13	9(69.2%)	2(15.4%)	2(15.4%)	0	
5-6yrs	4	2(50%)	2(50%)	0	0	
Duration of married life						
< 10yrs	11	1(9.1%)	1(9.1%)	7(63.6%)	2(18.2%)	χ 2 =37.796 df=15 p-0.0001*
11-20yrs	14	1(7.1%)	3(21.4%)	6(42.9%)	4(28.6%)	
21-30yrs	14	7(50%)	5(35.8%)	1(7.1%)	1(7.1%)	
31-40yrs	11	6(54.5%)	4(36.4%)	1(9.1%)	0	
41-50yrs	9	9(100%)	0	0	0	
More than 50 years	1	1(100%)	0	0	0	

**Fischer exact test*

emotional sub scores and social impact sub scores were 31.4, 9.7, 15.8 and 6 respectively. The hearing loss in these individuals interfere with day to day activities of the spouses in spite of them having no difficulties in hearing. It affects their social life, emotional wellbeing and have communication problems as reflected by the changes in the disability scores. Almost similar results were obtained in study by Preminger et al[10], where the mean total, communication, relationship and emotional and social impact disability scores were 32.87, 11.62, 18.26 and 2.99 respectively. The results were slightly higher for social impact in our study and less for the other two sub-scales. The higher impairment in social activity could be due to the reason that the mean age of the spouses were less (50.1 in comparison to 60.5) and there is an acknowledged reduction in social activity with ageing.

Most of the severe disabilities experienced by the spouses were in the areas associated with the need to use communication. Similar results were reported in other studies where communication was most commonly impaired in spouses of people with hearing loss.[10,11,12] The hearing loss compromises on the effectiveness of communication. Thus, communication is the key

element is maintaining a relationship as supported by previous studies.[7,11,13,14,15]

In general, it is expected that the more the hearing loss the greater will be the disability experienced by the spouse. However, in our study the severity of the hearing loss did not correlate with the severity of the disability scores as majority of our study population had mild or moderate hearing loss (only 6% had profound hearing loss). Similar findings have been reported in study by Ask et al.[16] However, in other studies the severity of the hearing loss was a predictor of the severity of the disability.[17, 18]

The more severe handicaps are seen only with recent onset of hearing loss. The more the duration of married life, the lesser is the disability and there is no disability when the duration of married life is more than 5 years. On similar lines, in a study by Yorgason et al, the acceptance of spouses' hearing loss was deemed to be a gradual process which develops with understanding of the causes of hearing loss.[15] On the contrary, results reported by Chong et al showed that duration of hearing loss is a predictor of third party disability.[18]

Numerous other factors are associated with distress among the spouses of people with hearing impairment like age,[17,18] sex,[16,17,18] working status[17] and presence of chronic aliments.[18] It was also found that younger partners of people with hearing disability experienced more hearing handicap and more distress than others whereas there was no association between age and hearing handicap in studies by Knussen et al[17] and Chong et al.[18] It was also noted that female spouses experienced more difficulty than male spouses as noted in other similar studies1[6,17,18,19,20] because females play a more crucial role than men in maintaining communication in relationship. However, working status of the significant others did not have any association with the third party disability scores as in the study by Knussen et al.[17]

The nature of work was not taken into consideration in our study. The presence of any chronic ailment in the spouse was associated with more third party disability. The dysfunction caused by the underlying disease could aggravate the disability caused by their partner's hearing impairment. In a study by Chong et al, the disability scores were more with underlying self reported eye disease.[17] People with higher relationship satisfaction were found to ascribe less negative attributions towards their spouses.[19]

The hearing loss has a significant influence not only on the patients with hearing loss but also on their spouses. The spouses have difficulties in areas where they have to use their communication skills. The spouses influence not only the quality of life but also the health seeking behaviour of the people with hearing loss and adherence to the treatment or rehabilitative measures. Taking into consideration the disability experienced by the spouse and addressing these issues will help in better rehabilitation of both the people with hearing loss and their partners.

The study involves use of a self reported questionnaire. There is no objective way of measuring third party disability. There is a possibility of under reporting or over reporting of certain items when such questionnaire is used. The study sample was essentially hospital based. Sampling from the community would give us better representation of the general population.

Conclusion

The study was conducted among spouses of 60 people with hearing loss along. The mean age of presentation was 50.4 years for people with hearing impairment and 50.1 for their spouses. From the study it can be concluded that hearing loss is associated with third party disability. There was no correlation between the degree of hearing loss and the third party disability scores. There was a significant association between the age of the spouse, duration of married life and the presence of chronic illness in the spouse with the severity of third party disability scores. Female spouses of people with hearing loss are more affected than the male spouses. There was no association between duration of hearing loss, working status of the spouses and third party disability.

The study prompts few recommendations like the need to acknowledge and address the disability in spouses of people with hearing loss, to include the spouses in treatment and rehabilitation plans and to provide couple counselling or communication education

for the spouses thereby including speech therapists and counsellors in treatment.

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References

1. National Sample Survey Organization. Disabled persons in India, NSS 58th round (July-December 2002) Report no.485 (58/26/1).New Delhi: National Sample Survey Organisation, Ministry of statistics and Programme Implementation, Government of India, 2003
2. World Health Organization. State of hearing and ear care in the South East Asia Region. WHO Regional Office for South East Asia. WHO-SEARO.SEA/Deaf/9. Available at http: //www.searo.who.int/LinkFiles/Publications.(accessed on 10 January 2018)
3. Garg S, Chadha S, Malhotra S, Agarwal AK. Deafness: Burden, prevention and control in India. Natl Med J India 2009; 22:79-81
4. World Health Organization. International Classification of Functioning, Disability and Health: ICF. World Health Organization; 2001
5. World Health Organization. International classification of functioning, disability and health: ICF. Geneva: World Health Organization; 2001
6. Brooks DN, Hallam RS, Mellor PA. The effects on significant others of providing a hearing aid to the hearing-impaired partner. British Journal of Audiology 2001; 35(3):165-71
7. Scarinci N, Worrall L, Hickson L. The effect of hearing impairment in older people on the spouse. International Journal of Audiology 2008;47(3):141-51
8. Stephens D, Kerr P, Jones G. Positive experiences reported by significant others of patients with hearing impairments. Audiological Medicine 2004; 2(2):134-8
9. World Health Organization Grades of hearing impairment http://www.who.int/pbd/[21] deafness/hearing_impairment_grades/en/index.html. accessed on 12/10/2017
10. Preminger JE, Meeks S. The Hearing Impairment Impact-Significant Other Profile (HII-SOP): A Tool to Measure Hearing Loss-Related Quality of Life in Spouses of People with Hearing Loss. Journal of the American Academy of Audiology 2012; 23(10):807-23
11. Scarinci N, Worrall L, Hickson L. The effect of hearing impairment in older people on the spouse: Development and psychometric testing of the Significant Other Scale for Hearing Disability (SOS-HEAR). International Journal of Audiology 2009;48(10):671-83
12. Schulz KA, Modeste N, Lee JW, Roberts R, Saunders GH, Witsell DL. Burden of hearing loss on communication partners and its influence on pursuit of hearing evaluation. Ear and hearing. 2017; 38(5):e285-91
13. Echalier M. In it together: the impact of hearing loss on personal relationships. Royal National Institute for Deaf People, London, UK. 2010
14. Scarinci N, Worrall L, Hickson L. Factors associated with third-party disability in spouses of older people with hearing impairment. Ear and hearing. 2012; 33(6):698-708
15. Yorgason JB, Piercy FP, Piercy SK. Acquired hearing impairment in older couple relationships: An exploration of couple resilience processes. Journal of Aging Studies 2007; 21(3):215-28
16. Ask H, Krog NH, Tambs K. Impact of hearing impairment on spousal mental health: the Nord-Trøndelag Health Study. European journal of public health 2009; 20(3):271-5
17. Knussen C, Tolson D, Swan IR, Stott DJ, Brogan CA, Sullivan F. The social and psychological impact of an older relative's hearing difficulties. Psychology, Health & Medicine. 2004; 9(1):3-15
18. Lih CS. Third party hearing disability at pre-and post-hearing aid provision (Doctoral dissertation)
19. Anderson DL, Noble W. Couples' attributions about behaviours modulated by hearing impairment: Links with relationship satisfaction Atribuciones de las parejas acerca de las conductas moduladas por la hipoacusia: vínculos con la satisfacción de la relación de pareja. International Journal of Audiology. 2005; 44(4):197-205
20. Wallhagen MI, Strawbridge WJ, Shema SJ, Kaplan GA. Impact of self-assessed hearing loss on a spouse: A longitudinal analysis of couples. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences. 2004; 59(3):S190-6.

Imperceptible Scar over Face and Neck: A New Aesthetic Modification of Parotid Incision

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ABSTRACT

Introduction

The mainstay of treatment for parotid tumours is surgery. Since the incision site involves visible areas of head and neck several modifications have evolved since its first description in 1912 by Blair and all the subsequent incisions have more or less aimed at giving better aesthesis in terms of post-operative facial scar. We describe a modification of earlier incisions for parotidectomy, which aims at camouflaging the post-operative facial and neck scar.

Materials And Methods

Fourteen patients were included in this study, who presented with parotid tumours and underwent either superficial or total parotidectomy. The modified incision was used in all the patients and various parameters were recorded (intra operatively as well as post operatively during the follow up visits, upto 1year) including post-operative scar visibility and patient satisfaction in terms of aesthetic appeal.

Results

All the 14 patients reported highly satisfied in terms of post-operative aesthetic outcome. There was no intra operative limitation of exposure by using this modified incision and neither any significant post-operative complication was encountered.

Conclusion

Our attempt at evolving an aesthetically modified incision for parotidectomy with no facial or neck scar post-operatively was achieved, along with certain more extended benefits of using this innovative incision.

Keywords

Parotid Neoplasms; Surgical Incision; Esthetics

Both benign and malignant tumours of the parotid are commonly encountered in clinical practice and pleomorphic adenoma accounts for 70% of parotid tumours.[1] Since surgery is the mainstay of treatment of parotid tumours, several modifications of the parotid incisions have evolved over the decades ever since the first description of the parotid incision was described by Blair in 1912 and modified by Bailey in 1941.[2] All the subsequent modifications have more or less aimed at reducing the post-operative facial scar and thus better aesthetic outcome.

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However none of the incisions described in literature has aimed at completely camouflaging the facial scar, which prompted us to modify the incision to the next level, leaving behind a completely scarless area over the face while at the same time enabling adequate exposure and delivery of the tumour, along with preservation of the facial nerve with all its branches.

Materials and Methods

All those patients who presented with parotid swelling to the ENT OPD between January 2017 to January 2019 and FNAC was suggestive of parotid tumour (both benign and malignant) and subsequently underwent either superficial or total parotidectomy under General anaesthesia were included in the study. A total 14 patients (male 6 and female 8) aged between 18-70yrs

Table I: Diagnoses of the parotid swellings

SERIAL NO.	AGE (YEARS)	SEX	DIAGNOSIS
1	38	M	Pleomorphic adenoma, Right parotid
2	55	F	Pleomorphic adenoma, Left parotid
3	28	F	Pleomorphic adenoma, Left parotid
4	25	M	Pleomorphic adenoma, Right parotid
5	27	F	Pleomorphic adenoma, Left parotid
6	27	M	Pleomorphic adenoma, Right parotid
7	18	M	Pleomorphic adenoma, Left parotid
8	48	M	Pleomorphic adenoma, Right parotid
9	70	F	Epidermal cyst, Left parotid
10	44	F	FNAC-Retention cyst, Left parotid HPE-Mucoepidermoid carcinoma
11	36	F	Pleomorphic adenoma, Left parotid
12	42	M	Pleomorphic adenoma, Right parotid
13	25	F	Pleomorphic adenoma, Left parotid
14	54	F	Pleomorphic adenoma, Right parotid

were included in the study. (Table I)

Out of the 14 patients, in 12 patients (85.71%) histopathology corroborated the FNAC diagnosis of pleomorphic adenoma and 1 patient (7.14%) was diagnosed as epidermal cyst while in another patient (7.14%) FNAC was suggestive of retention cyst but post operative histopathological examination reported mucoepidermoid carcinoma.

In all the 14 patients we used our aesthetically modified incision described as follows: This incision begins just in front of the root of helix, extending downwards over the free edge of tragus and curving backwards behind the lobule towards the mastoid tip and extending along the occipital hairline. (Fig.1a and 1b).This leaves no visible scar on the face and the posterior limb of the incision is well hidden behind the pinna and under the hair. There was no limitation in tumour exposure and its delivery and neither any difficulty was encountered in exposing the facial nerve with all its branches.

Ten patients were followed up post operatively at 1 month, 6 months and 1yr. Four patients were followed up at 1month and 6months and will be followed up at 1yr as well. We focussed primarily on assessing the post-operative scar visibility and patient satisfaction in terms of aesthetic appearance at the incision site.

Other complications like wound dehiscence, skin

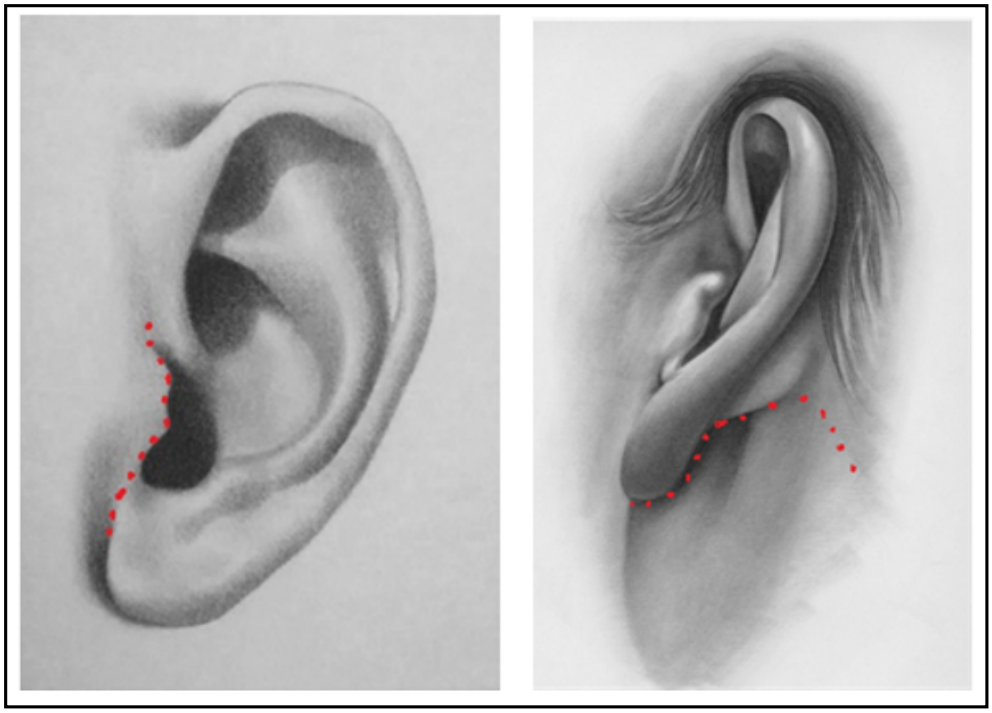

Fig.1a. Modification described in our study (source –authors own depiction of incision on artist pictures)

darkening, serous collection were also recorded.

Results

All the 14 patients had near imperceptible scar over the free edge of tragus and absolutely no facial scar, at 6 months and 1yr follow up. (Figs. 2a & 2b) Thus a very high satisfaction was reported by the patients. In a 5 step Patient satisfaction Scale ranging from dissatisfied to very satisfied, all the 14 patients reported very satisfied.

Other complications: Post operatively at 1 week follow up, 2 patients had darkening of skin in the post auricular region which healed well at 1 month follow up. One patient had serous collection at the post auricular region which was drained with a satisfactory healing of incision site. One patient who underwent superficial parotidectomy for retention cyst, the histopathological examination revealed mucoepidermoid carcinoma, hence total parotidectomy was done following which she developed grade 2 House Brackman facial weakness which recovered completely over 3 months.

Fig. 1b. The incision line

Fig. 2a. Post-operative results –completely camouflaged scar with excellent aesthesis.

Fig.2b. Post-operative completely camouflaged scar at 1 year follow up.

Yet another patient operated for pleomorphic adenoma had post-operative grade 3 facial palsy which completely recovered to grade 0 at 3 months follow up.

Discussion

Currently modified Blair incision is the most popular and widely used incision for parotidectomy.[2,4] This incision leaves a visible scar in front of the tragus and in the neck. (Fig. 3)

The facelift incision gained popularity after Appiani & Delfino reported its use in their study.[4] In this incision though neck scar is avoided, a visible scar in front of the ear is inevitable. (Fig. 4)

Retro-auricular hairline (RAHI) incision has no scar either in front of tragus or over it, as it is completely retro-auricular.(Fig. 5) This becomes a huge limitation when the tumour is lying in front of tragus (which is a common scenario), as it is impossible to achieve tumour exposure without an anterior incision in these cases.[5]

In another incision described by Panda et al, the

Fig. 3. Modified Blair's incision(Source: Bailey H.The tumours of the parotid gland with special reference to total parotidectomy. Br J Surg. 1941; 28:337-46)

Fig. 4. Facelift Incision (Source: Appiani E,Delfino MC. Plastic incisions for facial and neck tumors. Ann Plast Surg.1984; 13:335-52)

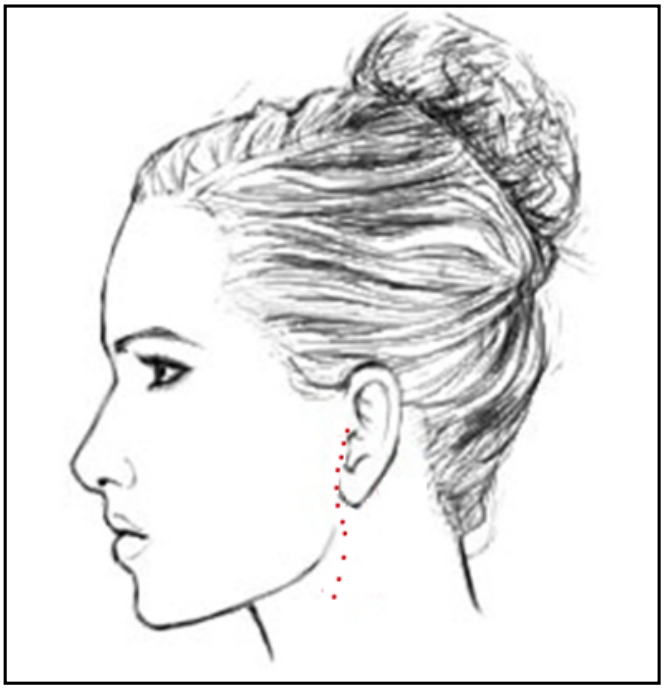

Fig. 6. Incision described by Dr Panda (Source: Panda NK, Kaushal D, Verma R. Do we need to modify the parotidectomy incision? Indian J Otolaryngol Head and Neck Surg. 2016; 68:487-9)

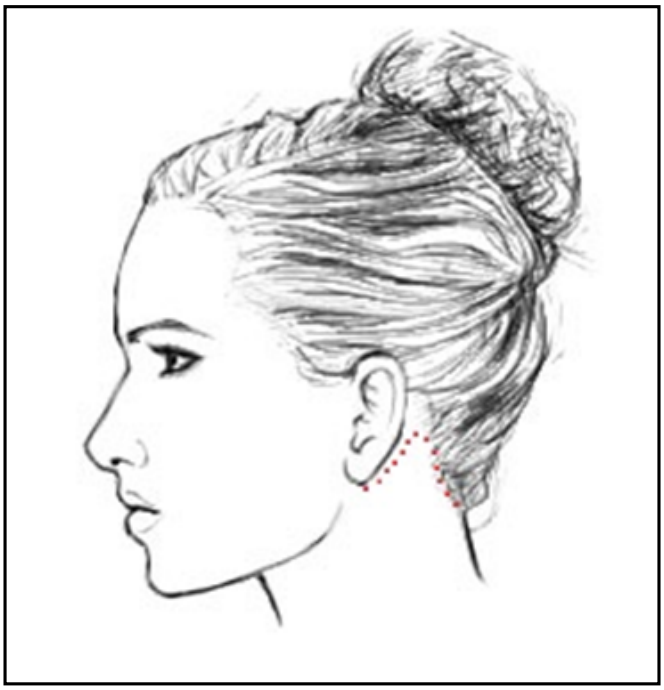

Fig. 5. Retroauricular hairline incision(RAHI) (Source: Roh JL.Extracapsular dissection of benign parotid tumor using a retroauricular hairline incision approach.Am J Surg. 2009; 197:e53-6)

incision extends down in front of the tragus with the vertical limb extending on to the neck without curving backwards, leaving a visible facial scar.[6](Fig. 6)

The only incision which is closest to our modification is the one described by Shah et al, in which the incision is over the free edge of tragus but after curving backwards again descends down on to the neck leaving a visible cervical scar.[7](Fig.7)

The incision described in our study leaves no visible scar either on the face or on the neck and does not compromise surgical exposure of the tumour. (Fig. 8) Neither was there any difficulty in locating and exposing the facial nerve. (Fig. 9) No significant post-operative complication was reported in any of the patients. To the best of our knowledge this modification evolved by us is not described in the literature hence we named the incision as Gangadhara and Sridhar's incision.

Extended benefits of using this incision:

This incision can also be used for accessing the

Fig. 7. Modification described by Dr Jatin Shah (Source: Shah J, Patel S, Singh B. Jatin Shah's Head and Neck Surgery and Oncology. 4th ed Mosby Elsevier. Salivary glands13:544-7)

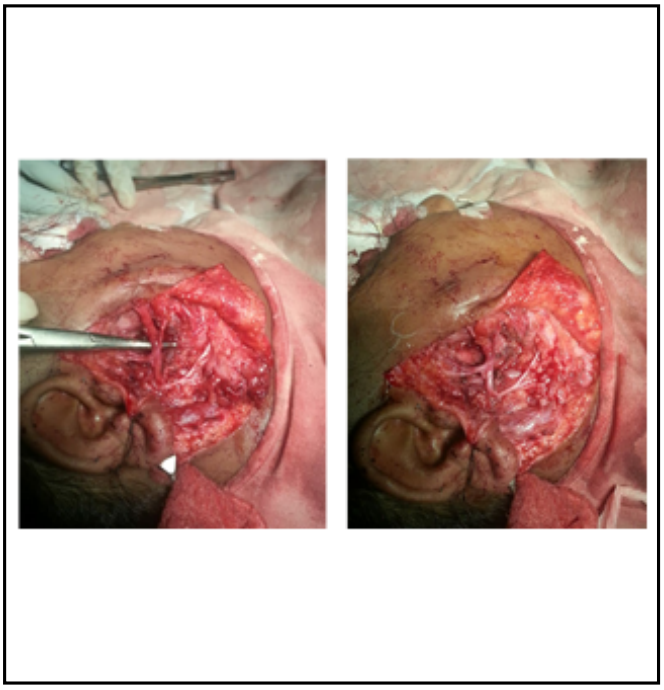

Fig. 9. Facial nerve exposure with all its branches after superficial parotidectomy using our modification

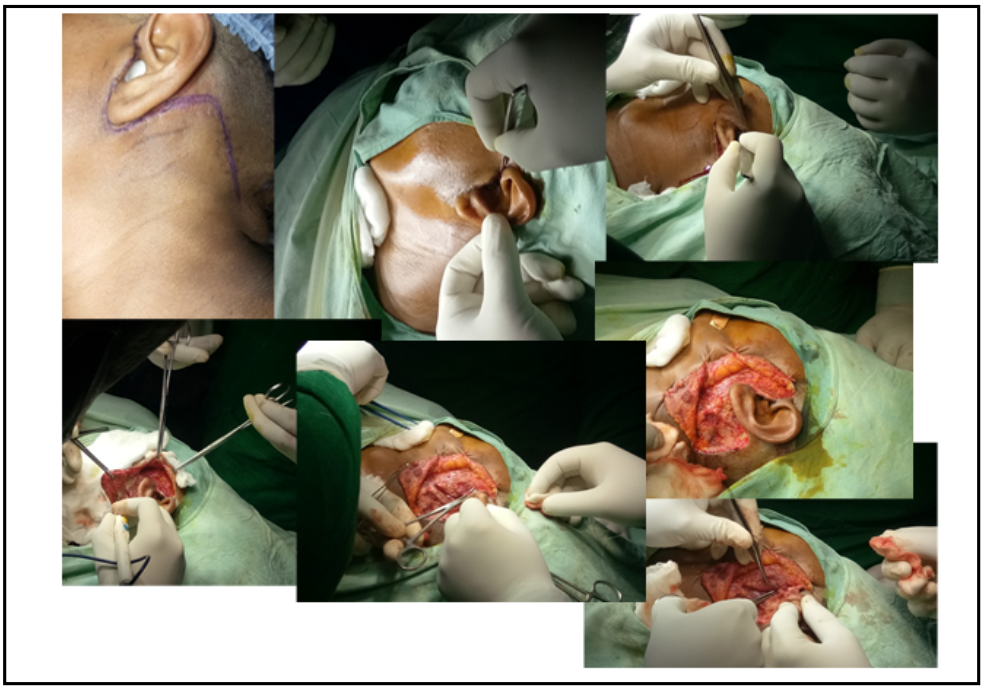

Fig. 8. Modification described in our study

mandibular condyle for fracture reduction procedures which otherwise routinely employs Alkayat Bramley incision (which leaves a visible scar in front of the ear).[3]

We would also like to highlight that if the tumour is low lying and not involving the area in front of the tragus the superior part of the incision can be completely avoided thereby starting the incision over the free edge of tragus which would further enhance the aesthetic appeal.

Conclusion

Patients were followed up from 6 months to 1 year and all the patients were highly satisfied with the aesthetic results achieved as no facial scar was perceptible. The incision enables satisfactory tumour exposure as well as facial nerve exposure. We encountered no significant post-operative complication. This incision can be used as an approach for other surgeries like mandibular condyle fracture reduction. Therefore, we are continuing to use the same incision for all the parotid surgeries. Large-scale study will further help us to validate our results.

References

1. Donovan DT, Conley JJ. Capsular significance in parotid tumour surgery: Reality and myth of lateral lobectomy. Laryngoscope 1984; 94(3):324-9
2. Upile T, Jerjes WK, Nouraei SA, Grant W, Singh S, Sudhoff H et al. Further anatomical approaches to parotid surgery. Eur Arch Otorhinolaryngol. 2010; 267(5):793-800
3. Ilizuka T, Ladrach K, Geering AH, Paveh J. Open reduction without fixation of dislocated condylar process fractures: Long term clinical and radiological analysis. J Oral Maxillofac Surg. 1998; 56:553-61
4. Appiani E, Delfino MC. Plastic incision for facial and neck tumours. Ann Plast Surg. 1984;13(4):335-52
5. Roh JL.Retroauricular hairline incision for removal of upper neck masses. Laryngoscope 2005; 115(12):2161-6
6. Panda NK, Kaushal D, Verma R. Do we need to modify the parotidectomy incision? Indian J Otolaryngol Head and Neck Surg. 2016; 68(4):487-9
7. Shah J, Patel S, Singh B. Jatin Shah's Head and Neck Surgery and Oncology. 4th ed. Mosby Elsevier. Salivary glands (13)544-7.

Comparison of Post-operative Outcomes of Endoscopic and Microscopic Type 1 Tympanoplasty-A Retrospective Study

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ABSTRACT

Introduction

With increasing popularity of Endoscopic middle ear surgeries, a better understanding of the features salient to endoscopic and microscopic tympanoplasty has gained importance. This study aims to compare the results of both.

Materials and Methods

It is a retrospective study based on MRD data collected from January 2017 to July 2018 on 40 patients with dry central perforation. 20 patients underwent endoscopic tympanoplasty and other 20 underwent microscopic tympanoplasty. Results of the surgery were compared at the end of 3 months which was based on the outcomes of surgery by means of graft uptake, comparison of pre-op and post-op audiogram readings .

Results

Eighteen cases (90%) of endoscopic surgery had mild CHL while in microscopic surgery 7 cases (35%) had moderate CHL. Average pre–op ABG was 29.05 dB in microscopic and 22.8dB in endoscopic surgery. Average post-op ABG 12.65dB and 18.4 for endoscopic and microscopic surgery. There was significant improvement in hearing gain in both the surgeries ($p<0.001$). Graft uptake was found to be have similar outcome.

Conclusion

Endoscopic tympanoplasty can be a good alternative of microscopic tympanoplasty but needs more training as compared to conventional method.

Keywords

Tympanoplasty; Endoscopy; Retrospective Study

Otitis media is a highly prevalent disease in middle ear and poses a serious health problem, more prominently seen in developing countries. Prevalence of COM in rural areas is 16.7%, urban population is 25% (peripheral areas) and 59% (Central areas).[1] Tympanoplasty is a surgical procedure used to eradicate the disease of the middle ear and reconstruct the ear drum. Major disadvantage of the operating microscope is that it provides a magnified image along a straight line which limits the visual field .Therefore the common problems encountered during surgery are in difficulty in visualising the sinus tympani, facial recess, difficulty in removing all the squamous epithelium in the area to be covered by the graft ,this leading to subsequent formation of epithelial pearls, development of tympanosclerotic patch, blunting of anterior recess, lateralisation of the graft due to difficulty to visualise anterior quadrant and incomplete placement of the graft.[1]

On the other hand endoscopic ear surgery is an emerging technique. It provides an excellent magnified image with good resolution. And all the problems mentioned earlier are not encountered in this surgery Magnification can be achieved by getting the endoscope closer to surgical field.[1,2] Major disadvantage of that it is a one handed technique. This became especially cumbersome where there is excessive bleeding. This problem is not encountered in microscopic ear surgeries. Another disadvantage of the endoscope is soiling of scope due to blood.[2] With increasing popularity of Endoscopic

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Table I: Comparison of graft uptake

	ENDOSCOPIC N(%)	MICROSCOPIC N(%)
Graft Uptake	**19(95%)**	**20(100%)**
Graft Rejection	**1**	**0**

middle ear surgeries, studies to correlate their post-operative outcomes have been undertaken. In this article we have done so by comparing the percentage of graft uptake and post-operative graft uptake.

Materials and Methods

This retrospective comparative study data was collected from the Medical records department in our hospital of patients who were admitted for unilateral Chronic Otitis Media, who underwent Type 1 Tympanoplasty, who had their pre-operative audiogram taken and who had their post-operative audiogram taken after 3 months of surgery. This was compared, based on their improvement in hearing. Forty (40) patients within the age group of 18-60 years were included in the study, who did not have any complications of chronic otitis media. Twenty (20) consecutive patients of each group (endoscopic and microscopic surgery) were taken up for data collection.

Results

In a total of 40 patients who had unilateral hearing loss, the mean age group for endoscopic cases was 27 years and microscopic cases was 31 years .

In endoscopic group 95% patients showed graft uptake while in microscopic surgery all 20 cases (100%) had graft uptake.(Table I) The study conducted on 40 patients with the data collected from medical records department between the age group of 16 to 50 years with dry central perforation which was irrespective of the size of the perforation. In endoscopic surgery 12 cases (60%) had medium size perforation and 8 cases had small perforation. In microscopic surgery 11 cases (55%) had medium size perforation and 9 cases had small perforation. 18 cases (90%) of endoscopic surgery had mild CHL while in microscopic surgery 7 cases (35%) had moderate CHL. (Table II) Average pre-op ABG was 29.05 dB in microscopic and 22.8 dB in endoscopic surgery. (Table III) Average post-op ABG 12.65 dB and 18.4 dB for endoscopic and microscopic surgery.(Table

Table II : Comparison of Pre & Post-op Audiogram

	ENDOSCOPIC TYMPANOPLASTY		MICROSCOPIC TYMPANOPLASTY	
HEARING STATUS	**PRE-OP**	**POST-OP**	**PRE-OP**	**POST-OP**
Normal	**0**	**8**	**0**	**2**
Mild Hearing Loss	**18**	**12**	**12**	**17**
Moderate Hearing Loss	**2**	**0**	**8**	**1**
Severe Hearing Loss	**0**	**0**	**0**	**0**

Table III:Comparison of Pre-op Air-bone gap in the two groups

A-B GAP	ENDOSCOPIC SURGERY	MICROSCOPIC SURGERY
11-20 dB	1	
21-30 dB	5	3
31-40 dB	11	9
41-50 dB	3	8

IV) There was significant improvement in hearing gain in both the surgeries ($p<0.001$). (Table V and Table VI) In endoscopic group 95% patients showed complete graft uptake while in microscopic surgery all 20 cases (100%) had complete graft uptake. No complications were noticed during the post op period which was of equal duration for all.

Discussion

Improvement in air bone gap was statistically significant in both studies. The post operative stay for all the patients was the same. No complications were noticed during the post op period which was of equal duration for all.

In this study the age group according to the inclusion criteria was 18-60 years, which included both sexes, the average age being 29.8 years. This was found to be similar to Tzu-Huang et al.[3] Patel et al had similar gender distribution as that of our study. It was found that the disease was more common in third decade of life.[4]

We achieved a graft success rate of 100% with microscopic procedure and 95% with endoscopic procedure which could be compared to Patel et al and Sinha et al.[4,5] This difference can be owed to a larger learning curve for endoscopic procedure and also it being a one hand procedure.

Pre-op air-bone gap was 29.05 dB and 22.8 DB for microscopic and endoscopic procedure respectively. Similar to Huang et al and Patel et al, where the studies had pronounced the same outcome as ours.[3,4]

Post op air-bone gap was 18.4dB and 12.65dB for microscopic and endoscopic procedures respectively. Outcome and the findings of the study was predominantly based on these results which was similar to Sinha et al and Kumar et al.[5,6]

Conclusion

In this study of endoscopic assisted and conventional microscopic tympanoplasty techniques, the graft uptake was found to be slightly better in microscopic surgery, while hearing improvement was the same in both the

Table IV:Comparison of post-op Air-bone gap in the two groups

A-B GAP	ENDOSCOPIC SURGERY	MICROSCOPIC SURGERY
0-10 dB	8	2
11-20 dB	8	10
21-30 dB	4	8

Table V: Mean Air Bone Gap in both groups pre surgery and at 3 months

	PRE Sx (MES)	POST Sx (MES)	PRE Sx (EES)	POST Sx (EES)
Mean air bone gap in dB	**29.05**	**18.4**	**22.8**	**12.65**
Standard deviation	**7.294**	**6.684**	**6.195**	**7.376**
P-value		**<0.0001 (Significant)**		**<0.0001 (Significant)**

Table VI: Comparison of air bone gap improvement in both groups at 3 months

	POST Sx (MES)	POST Sx (EES)
Mean air bone gap in dB	**18.4**	**12.65**
Standard deviation	**6.684**	**7.376**

surgeries. Endoscopic tympanoplasty can be a good alternative of microscopic tympanoplasty but needs more training as compared to conventional method.

References

1. Alabbasi AM, Alsaimary IE, Najim JM. Prevalence and patterns of chronic suppurative otitis media and hearing impairment in Basrah city. Journal of Medicine and Medical sciences 2010;1(4):129-33
2. Shoeb M, Vinod G, Samir B, Shashikant M. Comparison of surgical outcomes of tympanoplasty assisted by conventional microscopic method and endoscopic method. Int J Otorhinolaryngol Head Neck Surg. 2016; 2(4):184-
3. Tzu-Yen Huang, Kuen-Yao Ho, Ling-Feng Wang et al. A comparative study of endoscopic and microscopic approach Type 1 tympanoplasty for simple chronic otitis media. J Int Adv Otol. 2016;12(1):28-31
4. Patel J, Aiyer RG, Gajjar Y, Gupta R, et al.Endoscopic tympanoplasty versus microscopic tympanoplasty in tubotympanic CSOM: A comparative study of 44 cases. Int J Res Med Sci. 2015; 3(8):1953-7
5. Sinha M, Hirani N, Khilnani AK. Comparison of endoscopic underlay and microscopic underlay tympanoplasty:A prospective research at a tertiary care centre in Gujarat. Int J Otorhinolaryngol Head Neck Surg. 2017; 3(4):874-7
6. Kumar D, Thakur VK, Singh SP. A comparative study of endoscopic and microscopic approach tympanoplasty of simple chronic otitis media. IOSR J Dental and Medical Sciences 2016;15(11):101-4.

Sure Shot Technique for Management of Ranula

Chiranjib Das,[1] Pritam Chatterjee[2]

ABSTRACT

Introduction

Ranula is a pseudocyst in the floor of the mouth originating from the sublingual salivary gland. A variety of surgical procedures have been quoted in the literature. But the main concern is high rate of recurrence. Aim of the present study is to describe a definitive technique for managing ranula and compare the result with review of literature.

Materials and Methods

A prospective study was done in the department of ENT in a tertiary care hospital of West Bengal from 1st April, 2014 to 31st March, 2019. Patients presenting with ranula irrespective of age and sex; size of the mass; whether primary or recurrent case were included in the study. Patients presenting with congenital and plunging ranula were excluded. Patients were treated with total excision of ranula along with sublingual salivary gland. Patients were followed up regularly for at least one year post-operatively.

Results

We treated thirteen primary and four recurrent cases of ranula. Among them eight were male and nine were female. Patients were from seven to thirty three years of age with most being in the second decade of life. There was no injury to lingual nerve or submandibular duct in any patient. We did not observe any recurrence till date.

Conclusion

Successful management of a ranula includes identification of the extent of the cyst and removal of the cyst along with the sublingual salivary gland. When done meticulously, this technique gives 100% success without any complication.

Keywords

Ranula; Sublingual Gland

The word ranula has been derived from the latin word "Rana" which means the frog. This is because it resembles the translucent belly of a frog.[1] Ranula refers to a pseudocyst in the floor of the mouth originating from the sublingual salivary gland.[2] It is called pseudocyst, as it does not contain an epithelial lining.[3] Two variants of ranula have been described in the literature: simple ranula and plunging ranula. Simple ranulas remain confined to the sublingual space, whereas plunging ranulas extend behind the posterior edge of mylohyoid muscle to present in the neck.[4] In general they are asymptomatic, well circumscribed, fluctuant, bluish coloured swelling present in the floor of the mouth. The mass may interfere with speech, mastication, and swallowing due to the upward and medial displacement of the tongue.

In very rare occasions it may cause respiratory obstruction.[4] The diagnosis of a ranula can be made by a combination of history, clinical presentation, imaging studies and histopathological examination. A variety of surgical procedures have been quoted in the literature. But the main concern is high rate of recurrence. Aim of the present study is to describe a definitive technique for managing ranula and compare the result with review of literature.

Materials and Methods

A prospective study was done in the department of ENT in a tertiary care hospital of West Bengal from 1st April,

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Fig. 1. Intra-operative picture showing ranula after elevation of mucosa

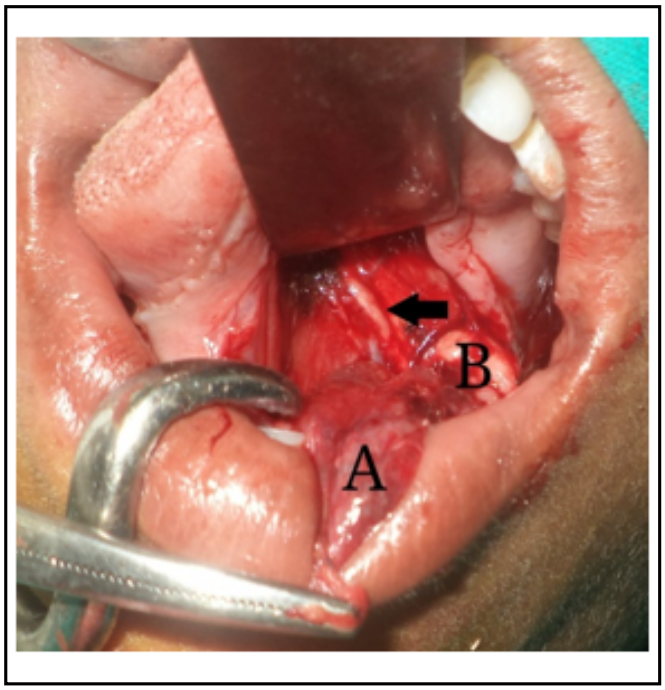

Fig. 2. Intra-operative picture showing ranula (A) along with sublingual salivary gland (B) and lingual nerve (black arrow)

2014 to 31st March, 2019. Patients presenting with ranula irrespective of age and sex; size of the mass; whether primary or recurrent case were included in the study. Patients presenting with congenital and plunging ranula were excluded. Diagnosis of ranula was done based on history, clinical examination, USG of floor of mouth and neck, and FNAC. Patients were treated with total excision of ranula along with sublingual salivary gland.

Operation was performed under general anaesthesia after doing all routine pre-operative investigations. Patient was placed in supine position with slight elevation of the head end. The oral cavity was kept open using Doyens mouth gag. Tongue was held out using stay sutures. The mucosa over the ranula was incised taking care not to enter the sac. A plane of dissection in the submucosa was established over the wall of the ranula (Fig. 1). Bleeding was controlled using bipolar diathermy. Using sharp and blunt dissections, the cyst was excised along with sublingual salivary gland taking care not to damage submandibular duct and lingual nerve (Figs. 2, 3). The wound was closed loosely with

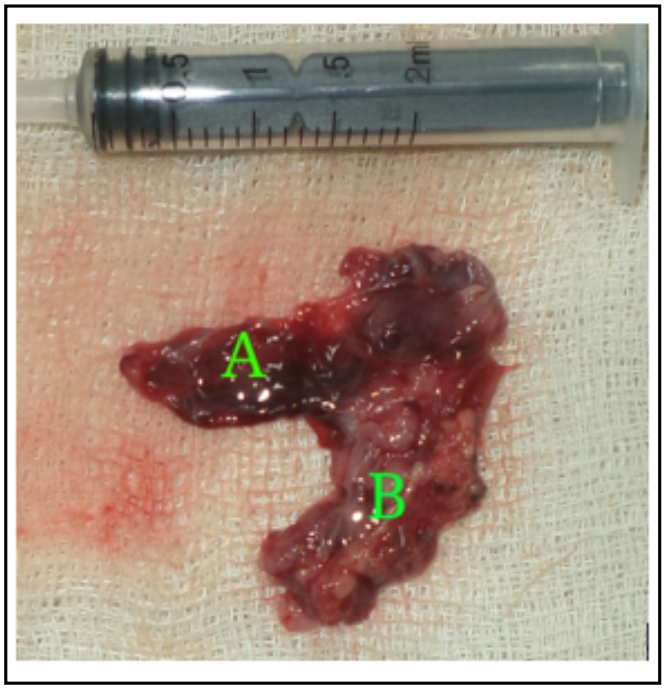

Fig. 3. Specimen of ranula (A) and sublingual salivary gland (B) after removal

Table I: Distribution of patients according to age

AGE GROUP (IN YEARS)	NUMBER OF PATIENTS
0-9	5
10-19	6
20-29	4
30-39	2

3-0 Vicryl® sutures. Patients were followed up regularly for at least one year post-operatively.

Results

During the study period total seventeen patients were operated for ranula. Among them eight were male and nine were female. Patients were from seven to thirty three years of age. Maximum numbers of patients were in the second decade of life (Table I). There was history of surgical intervention for same disease in four patients. Twelve patients had ranula in right side and five patients had in left side of floor of mouth. There was no injury to lingual nerve or submandibular duct in any patient. Wound healing was good in all patients. Till date no recurrence has occurred.

Discussion

"Ranula" was first reported by Hippocrates and Celsius.[5] The current knowledge domain reveals that ranulas originate primarily from the sublingual salivary gland. Trauma to the sublingual gland duct leads to mucus extravasation and subsequent accumulation of saliva, and pseudocyst formation.[6] Ranula is a rare surgically amenable disease of the salivary glands as described by various researchers.[7] Rarity of the disease may be responsible for the dearth of literature on the subject. More so, several studies by most scholars have been case reports.[8] The present study was done in a tertiary care hospital, where cases are referred from several districts. Nevertheless, we found only seventeen patients including both primary and recurrent cases in five years study period. Studies including those of Chidzonga et al. and Zhao et al reported female gender predilection with no clear scientific basis.[9,10] In the present study ratio of male and female patients was 1:1.13. Simple ranula is common during the first and second decade of life.[11]

In the present study maximum numbers of patients were in the second decade of life. The differential diagnosis of simple ranula encompasses a host of lesions like lipoma, dermoid cyst, salivary gland tumours, hemangioma, and lymphangioma.[12] The diagnosis is often a clinical one based on typical history and appearance of mass. Imaging helps in confirming the diagnosis and ascertaining the neck extension if present.[13] There is no consensus opinion on the definitive management of ranula. Multiple options exist, including surveillance, needle aspiration, surgical excision of the cyst, excision of sublingual gland with or without the cyst, marsupialisation, sclerotherapy, laser excision or cryosurgery.[14,15] However, different outcomes have been reported with each approach having varying complications. Recurrence has been reported to be the main concern.

In earlier days the most common technique used was marsupialisation. It had high recurrence rate of 61%-89% as the cyst was not completely excised. In some instances, it served as a precursor for plunging ranula.[16] In order to evade this problem, Yang and Hong recommended removing the cyst along with the sublingual gland.[13] Crysdale et al. reported that the recurrence rate was 100% in cases with incision and drainage, 61% in cases

of simple marsupialization, and 0% in case of excision of the ranula with or without sublingual gland excision.[1] In a study, Sigismund et al. in a retrospective analysis of 65 patients reported a recurrence prevalence of 3.6% following complete excision of the sublingual gland alone compared with 36.7% prevalence with ranula excision alone.[17] Zhao and co-workers concur that recurrence rates of ranula excisions are excessive unless the sublingual gland is removed.[10] A sublingual gland excision involves the potential risk for injury to the Wharton's duct, obstruction of submandibular gland, lingual nerve injury. We treated thirteen primary and four recurrent cases of ranula with complete excision of ranula along with sublingual salivary gland. We did not observe any recurrence till date. Many-a-times ranula bursts spontaneously or during operation. This doesn't pose any difficulty in complete excision of the cyst. We did not come across any injury to submandibular duct and lingual nerve. The only drawback of this procedure, in our opinion is longer time of operation as compared to simpler techniques.

Conclusion

Ranula is a rare surgically amenable disease of the salivary glands. Though it is benign condition, it is notorious for recurrence. Successful management of a ranula includes identification of the extent of the cyst and removal of the cyst along with the sublingual salivary gland. When done meticulously, this technique gives 100% success without any complication.

References

1. Crysdale WS, Mendelsohn JD, Conley S. Ranulas – Mucoceles of the oral cavity: Experience in 26 children. Laryngoscope 1988; 98(3):296-8
2. Zhi K, Wen Y, Ren W, Zhang Y. Management of infant ranula. Int J Pediatr Otorhinolaryngol. 2008; 72:823-6
3. Bronstein SL, Clark MS. Sublingual gland salivary fistula and sialocele. Oral Surg Oral Med Oral Pathol. 1984; 57(4):357-61
4. Regezi JA, Sciubba JJ, Jordan RCK. Oral pathology, clinical pathologic correlations. In: Regezi JA, Sciubba JJ, eds. 3rd ed. Philadelphia: WB Saunders Company; 1999:220-222
5. Cedric A.Q; Seth HL. Ranula and the Sublingual Salivary Glands. Arch Otolaryngol. 1977; 103(7):397-400
6. Harrison JD. Modern management and pathophysiology of ranula: Literature review. Head Neck 2010; 32:1310-20
7. Rho MH, Kim DW, Kwon SS et al (2006). OK-432 Sclerotherapy of plunging ranula in 21 patients. It can be a substitute for surgery. AJNR Am J Neuroradiol. 2006; 27(5):1090-5
8. Dayton K, Ryan MF. Symptomatic floor of mouth swelling with neck extension in a 14 year-old girl. Case Rep Pediatr. 2014; 2014:8319-23
9. Chidzonga MM, Rusakaniko S. Ranula: another HIV/ AIDS associated oral lesion in Zimbabwe. Oral Dis. 2004; 10:229-32
10. Zhao YF, Jia Y, Chen XM et al. Clinical review of 580 ranulas. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004; 98:281-7
11. Batsakis JG, McClatchey KD. Cervical ranulas. Ann Otol Rhinol Laryngol. 1988; 97:561-2
12. Shafer WG, Hine MK, Levy BM. A text book of oral pathology. Philadelphia: WB Saunders; 2009;6:543
13. Yang Y, Hong K. Surgical results of the intraoral approach for plunging ranula. Acta Otolaryngol (Stockh). 2014; 134(2):201-5
14. Patel MR, Deal AM, Shockley WW. Oral and plunging ranulas: What is the most effective treatment? Laryngoscope 2009; 119:1501-9
15. Zhi K, Gao L, Ren W. What is new in management of pediatricranula? Curr Opin Otolaryngol Head Neck Surg. 2014; 22(6):525-9
16. Haberal I, Gocmen H, Samim E. Surgical management of ranula. Int J Paediatr Otorhinolaryngol. 2004;68:161-3
17. Sigismund PE, Bozzato A, Schumann M, et al (2013). Management of ranula: 9 years' clinical experience in pediatric and adult patients. J Oral Maxillofac Surg. 2013; 71(3):538-44.

Efficacy and Safety of Microdebrider Assisted Adenoidectomy over Conventional Adenoidectomy

Anil S Harugop,[1] Samanvaya Soni,[1] Tejaswini J S[1]

ABSTRACT

Introduction

Adenoidectomy has conventionally been performed by curetting the adenoid tissue blindly with St. Clair Thompson curette leading to inadequate removal of tissue. Here the use of endoscopic guided adenoidectomy with microdebrider has been employed to compare the two methods.

Materials and Methods

It is a one-year randomized control trial conducted from January 2018 to December 2018. Patients were allocated into 2 groups i.e. conventional adenoidectomy and microdebrider adenoidectomy group. Pre and post-operative endoscopic grading of adenoid was compared and intraoperative blood loss and operative time were studied.

Results

Total 45 patients included 25 in conventional and 20 in microdebrider group. Following adenoidectomy operation the percentage of reduction of adenoid grading in microdebrider group was 63.79 % whereas 30.29% in conventional group, the average time taken by microdebrider assisted surgery was 16.45 mins as compared to 13.28 mins in conventional curettage. The average amount of blood loss in conventional group was 44.76 ml whereas in microdebrider group was 77.30 ml.

Conclusion

Microdebrider assisted adenoidectomy has proven to deliver completeness of clearance at the expense of slight increase in bleeding and the operative time.

Keywords

Adenoidectomy; Microdebrider, power-assisted; Endoscopic; Curettage

The adenoids are an aggregate of lymphoid tissues located in the posterosuperior region of the nasopharynx and directly affect the breathing in the upper airway. At birth the adenoids are relatively smaller in size and due to the hyperactivity of the immune system they progressively enlarge during the initial years of life and thus can manifest with nasal obstruction.1

Adenoidectomy is the mode of treatment employed in managing sleep disordered breathing which is manifested as nasal obstruction, mouth breathing and snoring, middle ear pathologies, chronic rhino-sinusitis and recurrent adenotonsillitis.2 It is conventionally performed by the curettage method with St. Clair Thompson adenoid curette which is a blind procedure. Damage to Eustachian tube opening leading to middle ear pathologies and also the remnant adenoid tissue postoperatively is a known fact. With the advent of endoscopes, surgeries in the nasal cavities have become safer as they are being performed under vision and hence surgeons now-a-days are harnessing the power of it even in the anatomically challenging region of nasopharynx.2

Microdebriders are electrically powered instruments which have an excellent safety profile. They provide precise atraumatic dissection with lesser complications and faster postoperative healing. This study is designed to compare the microdebrider assisted adenoidectomy with the conventional curettage adenoidectomy and to study the efficacy and safety of microdebrider at our

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Materials and Methods

This study is a randomized controlled trial done in a tertiary care hospital over a period of 1 year from January 2018 to December 2018. A total of 45 patients were included and were divided into 2 groups randomly using their unique hospital identification number (odd number patients in group A and even number in group B). Group A patients underwent conventional curettage adenoidectomy and group B underwent microdebrider assisted adenoidectomy. The patients included were between the age group of 3-16 years and had symptoms of obstructive sleep apnoea, mouth breathing and snoring or adenoid facies. Patients having craniofacial syndromes (cleft lip or cleft palate) were excluded from study. Ethical clearance was obtained from the institution ethical committee.

Informed consent, routine blood investigations and fitness for surgery were taken. All the patients were operated under general anaesthesia with orotracheal intubation. Pre-operative endoscopic assessment of adenoid grade was done using Clemens-McMurray grading scale.3In the group A adenoidectomy was done using the St. Clair Thompson adenoid curette. In the group B microdebrider assisted adenoidectomy under endoscopic vision was done. We have used the microdebrider with 45□ angled blade through oropharynx, set at 15 cc/min irrigation and 5000 oscillation/second. The zero degree endoscope is inserted through either of the nostrils. The intra operative parameters studied were operative time, blood loss, and completeness of clearance of adenoids. Post-operative parameter included assessment of damage to surrounding structures after 3 weeks with a repeat endoscopy.

Intra operative time was taken as the total time from the patient being handed over by the anaesthetist to surgeon to the time the patient is handed back to the anaesthetist for extubation. The amount of bleeding was assessed by a guide given by Algadiem et al. in 2009.4 Where they have calculated that a 10x10 cm. Square piece of gauze used for packing the nasopharynx will correspond to a volume of 12 ml. In the microdebrider group the blood loss was calculated by subtracting the irrigation solution from the total collected fluid in the suction machine. The amount of irrigation solution will be noted down during surgery to avoid calculation error and prior to the surgery the suction machine will be emptied completely. The completeness of clearance of adenoid was assessed by nasal endoscopy at the end of the procedure in both the groups.

The study is focused on comparison of two groups. For the continuous quantitative variables mean and standard deviation were calculated. The inter group continuous variables were compared using suitable tools of statistics like normal test, unpaired student's t test. Two quantitative variables, within a group, were compared using student's paired t test. Discrete variables were represented by median. Suitable graphs were used to depict the comparison. The categorical data was expressed in terms of rates, ratios and percentages. The association between the outcome, clinical and demographic characteristics was tested using Chi-square test or Fisher's exact test. Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) software. For all the tests the value of p less than 5% (0.05) was considered significant.

Results

Total number of cases in the present study were 45 where 25 patients (males 13 and females 12) belonged to group A and 20 patients (males 12 and females 8) belonged to group B. there was a male preponderance of 55.56%. The mean age of patients undergoing adenoidectomy was 9.24 years. The most common presenting complaint was mouth breathing and snoring followed by nasal obstruction and nasal discharge. (Fig. 1) Both the groups were comparable with respect to age, symptoms, gender and pre-operative endoscopic adenoid grade.

Clemens and McMurray adenoid grading before and after operation:

The conversion of patients after adenoidectomy to grade 1 is 12% and grade 2 is 64% in conventional group as compared to 95% patients landing in grade 1 post microdebrider assisted adenoidectomy which is

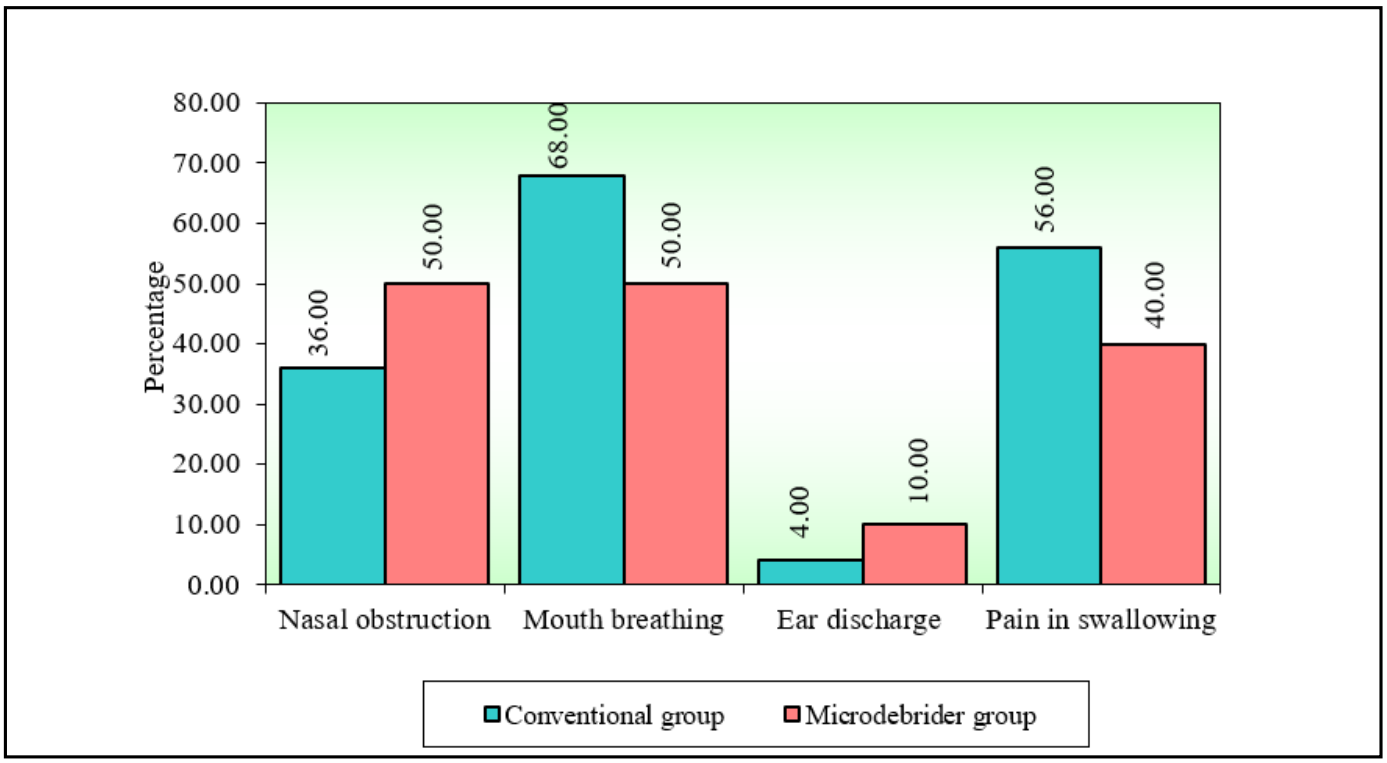

Fig.1. Comparison of two study groups (Conventional and Microdebrider) by chief complaints

statistically significant ($p<0.05$). (Table I)

By using matched pair test it was clearly seen that pre-operative to post-operative endoscopic grading of adenoid showed that in both the groups the completeness of clearance is statistically significant but in microdebrider group the percentage of change i.e. the reduction of grading post operatively is 63.79% as compared to 30.29% in conventional group , which indicates the effectiveness of microdebrider. (Table II)

Operative time taken:

The average time taken by microdebrider assisted surgery was 16.45 mins as compared to 13.28 mins taken by conventional method which was significantly higher with a p-value of less than 0.05 and was statistically significant($p=0.041$).(Fig. 2)

Intraoperative blood loss:

The average amount of blood loss in conventional group was 44.76 ml whereas in microdebrider group was 77.30 ml. The blood loss was higher in microdebrider assisted adenoidectomy and was statistically significant ($p<0.05$). (Fig. 2)

Post-operative complications:

At 3 weeks follow-up none of the patients in either of the 2 groups showed eustachian tube dysfunction, uvular injury or posterior pharyngeal wall scarring.

Discussion

Conventional curettage adenoidectomy is a blind and crude procedure and as stated by Koltai and Havas in their studies in 1997 and 2002, there is often residual tissue left behind near choana and torus tubaris region.[5,6] Our study also showed that residual tissue was left behind in children undergoing conventional curettage adenoidectomy specially near the choana. This might be due to the inability of adenoid curette to reach these

Table I: Clemens and McMurray adenoid grading before and after surgery

ADENOID GRADE	CONVENTIONAL		MICRODEBRIDER		TOTAL	
	PRE-OP	POST-OP	PRE-OP	POST-OP	PRE-OP	POST-OP
1	0	3	0	19	0	22
2	5	16	5	1	10	17
3	14	6	12	0	26	6
4	6	0	3	0	9	0
Total	25	25	20	20	45	45

areas and therefore it can be ascertained that these children may have persistent symptoms post-surgery.

In 1997, Koltai et al., had brought power-assisted adenoidectomy in light and under the vision of laryngeal mirror they achieved a superior resection of adenoid.[6] Yanagisawa and Weaver in 1997 used an endoscope along with a microdebrider through a transnasal approach and concluded that they had a completeness of clearance of adenoid with significantly lesser complications.[7] Costantini et al. in 2008, had used a 70° endoscope with video attachment introduced and a 40° microdebrider blade through the mouth to remove the adenoid and they realised that the limitation of mobility of instruments through the nasal cavity could be overcome with this approach.[8] Anand et al. in 2014 suggested that this difficulty of manouvering the instruments can be overcome by passing the endoscope through one nostril and straight blade microdebrider through the other.[9]

Pagella et al. in 2009, on the other hand, combined conventional curettage method with endoscopic method and concluded that with this method though a longer time is taken for surgery but the need to use angled endoscopes and microdebrider blades can be avoided.[10] Same was suggested by Das et al. in 2017.[11]

Only performing the surgical steps of the adenoidectomy would take about 5-10 minutes, but a proper evaluation of the operative time must include all the steps like setting up the instrument trolley, painting and draping, achieving haemostasis and taking pre

Table II: Comparison of completeness of clearance of adenoids in both groups

GROUPS	TIME	MEAN	SD	MEAN DIFF.	SD DIFF.	% OF CHANGE	Z-VALUE	P-VALUE
Conventional group	Pre-op	3.04	0.68					
	Post-op	2.12	0.6	0.92	0.57	30.26	3.9199	0.0001*
Microdebrider group	Pre-op	2.9	0.64					
	Post-op	1.05	0.22	1.85	0.59	63.79	3.9399	0.0001*

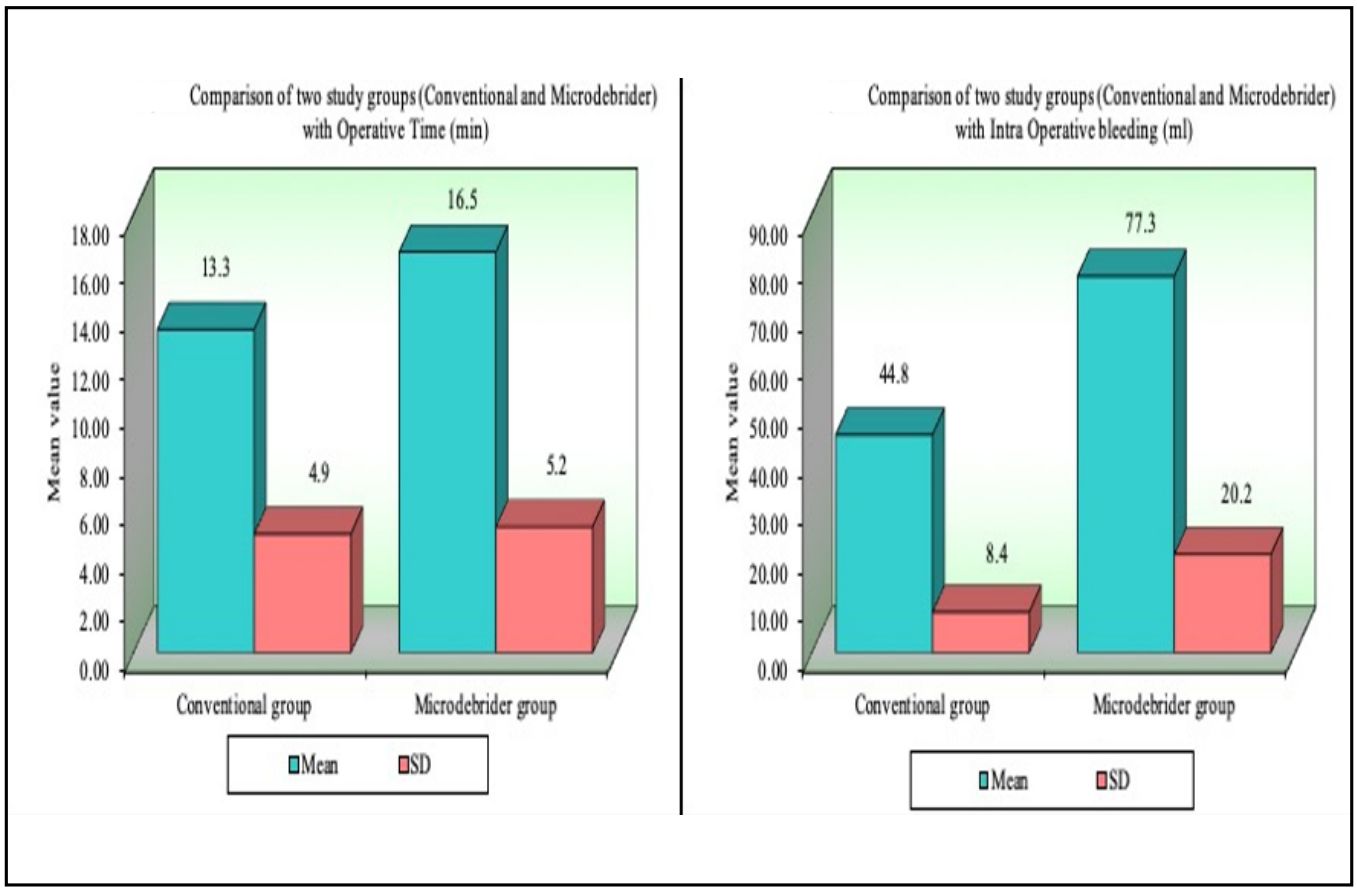

Fig. 2. Comparison of operative time taken and comparison of intra operative bleeding.

and post-operative endoscopic pictures of adenoids. In short, the time taken from patient being handed over to the surgeon by anaesthetist to the complete haemostasis of nasopharynx. The duration of microdebrider assisted adenoidectomy in our study was approximately 16 minutes 45 seconds which was roughly 3 minutes more than conventional adenoidectomy. This was due to increased time taken while setting up connections for powered instruments as well as repeated defogging of endoscope. In a study by Somani et. al. (2010), their operating time with endoscopic technique was 12 minutes 30 seconds, which was 2 minutes shorter than conventional adenoidectomy.[12] This finding was in contrast to our study.

We have used zero-degree endoscope through the nose with a 45° curved blade microdebrider through oropharynx whereby we prevented injury to the soft palate by retracting the soft palate anteriorly by using a red rubber catheter passed through the other nostril and brought out through the mouth and clamped on the head towel. Our findings are opposite to those by Stanislaw et. al.,[13] where powered adenoidectomy has merited to be 20% faster than curettage adenoidectomy. They also used 45-degree microdebrider blade through oropharyngeal route coupled with a laryngeal mirror for visualization. This might be the reason why they took lesser time, as setting up of powered instruments and repeated defogging was not needed in their case. In our opinion microdebrider can be a potentially dangerous instrument if not used under vision therefore we recommend endoscopic visualization.

Since in all the above-mentioned studies the operative instruments were not constant and the criterion for defining time taken for operation was not certain, so it

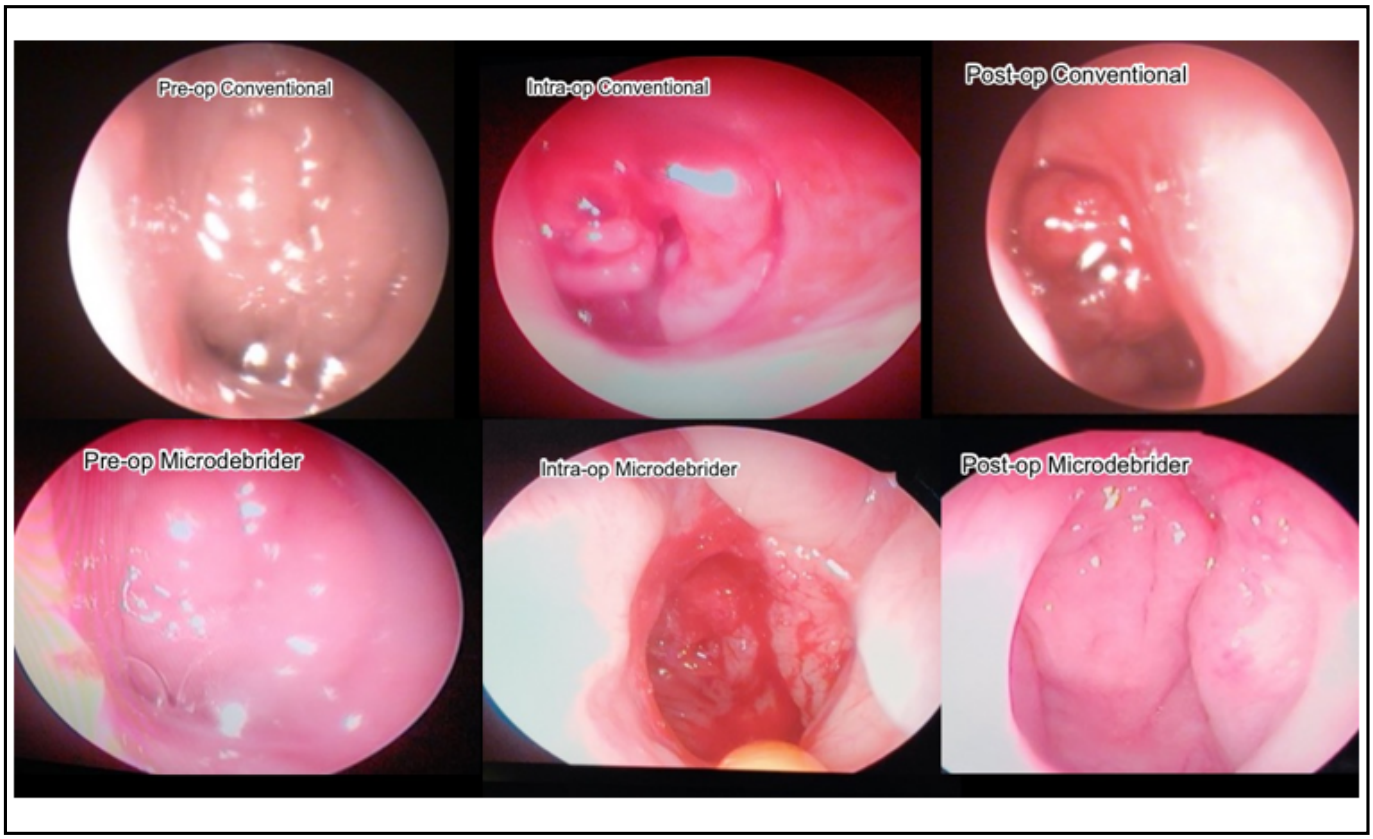

Fig. 3. Endoscopic images showing pre, intra and post-operative status of both the surgical methods

won't be correct to compare operative time.

In our study the intra-operative blood loss is more in microdebrider group. This was statistically significant though the difference was small i.e. 30 ml. Stanislaw et al.[13] however reported a significant reduction in blood loss with endoscopic technique which was in contrast to our study. Also, in study by Feng et. al.[14] conventional adenoidectomy group had more bleeding though it was not statistically significant. As the microdebrider cuts the tissues little by little in an oscillating fashion the bleeding surface is exposed for a longer time and the continuous suction effect of microdebrider also sucks in more blood.

After conventional adenoidectomy, 64% of patients still had grade II and 24% had grade III remnant adenoid tissue (Table I) which might later regrow and cause airway obstruction. Our results are similar to the ones reported by Havas et al. in 2002 and Pagella et al. in 1997, where the remnant adenoid was seen in 39% and 49% cases respectively.[5,10] The possible explanation to such high quantity of remnant adenoids in our understanding is that during conventional adenoidectomy only the tissue that overlies choana fails to get cleared or is pushed towards the nasal cavity, which on endoscopy is perceived as adenoids obstructing the choana. Whereas with the help of endoscope, the nasopharynx can be clearly visualised and any remnant thereof can be removed and a complete clearance of disease can be achieved.

In present study 95% of the patients post microdebrider assisted adenoidectomy landed with grade I adenoid. (Table I) Therefore, it can be agreed that endoscopic microdebrider-assisted adenoidectomy has the advantage of improved visualization and continuous suction of blood from the surgical field, thus one can precisely remove adenoid tissue from the choana and torus tubaris.[13] (Fig. 3)

Collateral damage to adnexa following adenoidectomy is less but there is always a fear of trauma to the eustachian tube opening and subsequent ontological complications. In our study the torus tubarius region was partially injured in two cases of curettage adenoidectomy. In microdebrider group, however there was an increased incidence of nasal mucosal injuries. To summarise, though both techniques have their own peculiar problems, they are usually self-resolving and minor. None of the patients developed any known post-operative complications like otitis media with effusion or damage to soft palate or uvula.

The newer method of microdebrider assisted adenoidectomy was found to be a safe and efficacious tool in terms of completeness of clearance. However, the drawbacks were increased time taken for surgery and increased amount of bleeding. The newer procedure still has some contra-indications and can't be used for taking a biopsy.

In the Indian scenario the limitation of instrumentation and the cost of surgery are important factors which govern the choice of surgical method. The use of nasal endoscopes is a routine practice now but availability of powered instruments like microdebrider is still less. Endoscopic microdebrider-assisted adenoidectomy is technically more difficult to perform than conventional adenoidectomy[6,13] but those surgeons who are routinely performing endoscopic sinus surgery in them the learning curve is smaller[15] and there was also high degree of surgeon satisfaction due to improved plane of dissection.[13] Now a days documentation is very important and The TV monitor relays the display enabling recording for documentation and teaching purposes.

Conclusion

Adenoidectomy is a routine Otolaryngologic surgery done in Paediatric age group for various indications and often after conventional curettage there is remnant adenoid tissue which doesn't alleviate the symptoms. Microdebrider assisted adenoidectomy has proven to deliver completeness of clearance at the expense of slight increase in bleeding and the operative time. Though the cost of surgery is higher but precise dissection under vision, lesser complications and better disease clearance makes this technique a safe and efficacious alternative over the blind curettage method.

References

1. Kim JW, Kim HJ, Lee WH, Kim DK, Kim SW, Kim YH, et al. Comparative study for efficacy and safety of adenoidectomy according to the surgical method: A prospective multicenter study. PLoS ONE 2015; 10(8):2-9
2. Datta R, Singh VP, Deshpal. Conventional versus endoscopic powered adenoidectomy: A comparative study. Med J Armed Forces India. 2009; 65(4):308-12. doi: 10.1016/S0377-1237(09)80089-0
3. Clemens J, McMurray JS, Willging JP. Electrocautery versus curette adenoidectomy: comparison of postoperative results. Int J Pediatr Otorhinolaryngol. 1998; 43(2):115-22
4. Algadiem EA, Aleisa AA, Alsubaie HI, Buhlaiqah NR, Algadeeb, Bagir J, et al. Blood Loss Estimation Using Gauze Visual Analogue. Trauma Mon. 2009; 21(2):1-9
5. Havas T, Lowinger D. Obstructive Adenoid Tissue. Arch Otolaryngol Neck Surg. 2002; 128(7):789
6. Koltai PJ, Kalathia AS, Stanislaw P, Heras HA. Power-Assisted Adenoidectomy. Arch Otolaryngol Head Neck Surg. 1997; 123(7):685-8. doi: https://doi.org/10.1001/archotol.1997.01900070023004.
7. Yanagisawa E, Weaver EM. Endoscopic adenoidectomy with the microdebrider. Ear Nose Throat J. 1997; 76(2):72-4
8. Costantini F, Salamanca F, Amaina T, Zibordi F. Videoendoscopic adenoidectomy with microdebrider. Acta Otorhinolaryngol Ital Organo Uff Della Soc Ital Otorinolaringol E Chir Cerv-facc. 2008; 28(1):26-9
9. Anand V, Sarin V, Singh B. Changing Trends in Adenoidectomy. Indian J Otolaryngol Head Neck Surg. 2014; 66(4):375-80
10. Pagella F, Matti E, Colombo A, Giourgos G, Mira E. How we do it: A combined method of traditional curette and power-assisted endoscopic adenoidectomy. Acta Otolaryngol (Stockh). 2009; 129(5):556-9
11. Das AT, Prakash SB, Priyadarshini V. Combined conventional and endoscopic microdebrider-assisted adenoidectomy: A tertiary centre experience. J Clin Diagn Res. 2017; 11(2):MC05-7
12. Somani SS, Naik CS, Bangad SV. Endoscopic Adenoidectomy with Microdebrider. Indian J Otolaryngol Head Neck Surg. 2010; 62(4):427-31
13. Stanislaw Jr. P, Feustel PJ, Koltai PJ. Comparison of power-assisted adenoidectomy vs adenoid curette adenoidectomy. Arch Otolaryngol - Head Neck Surg. 2000; 126(7):845-9
14. Feng Y, Yin S. Comparison of the powered-assisted

adenoidectomy with adenoid curette adenoidectomy. Lin Chuang Er Bi Yan Hou Ke Za Zhi. 2006; 20(2):54-7

15. Abdel-Aziz M. Endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy. Eur Arch Otorhinolaryngol. 2012; 269(3):1037-40.

Feasibility of Transoral Thyroidectomy by Vestibular Approach

Kshitij Shah,[1] Shivali Patekar,[1] Tejal Patel,[1] Renuka Bradoo[1]

ABSTRACT

Introduction

An open approach to thyroidectomies through neck provides good exposure and safe dissection however, the patient still has a scar. Endoscopic thyroid surgery has been practised since the late 90s. The latest addition is the transoral endoscopic thyroidectomy by vestibular approach.

Materials and Methods

We at our centre performed this surgery on 3 patients. Here we present our initial experience of transoral endoscopic thyroidectomy by vestibular approach (TOETVA).

Results

Two of the three patients did not have any complication. Diffuse bleeding was encountered during one instance and decision was taken to convert it into an open procedure.

Conclusion

The preliminary experience of transoral thyroidectomy by vestibular approach shows it to be a feasible and promising 'scarless' and 'minimally invasive' surgery.

Keywords

Thyroidectomy; Endoscopic, transoral

The history of thyroid surgery dates back to millennia. Abu al-Qasim is credited with performing the first goitre excision as recorded in his surgical tome, "Al-Tasrif", in 952 AD.[1] From then thyroid surgery was condemned for most of its history. Surgeons across the world described thyroid surgery as 'one of the most thankless, most perilous undertakings which, if not altogether prohibited, should at least be restricted, dismissing such operations as 'foolhardy performances' and as 'horrid butchery … deserving of rebuke and condemnation'. It was the likes of Billroth, Kocher and Halstead that resolved the difficulties of modern thyroid surgery and thyroid surgery became one of the most widely practised surgeries across the globe. We have come a long way from the traditional staged thyroid surgeries to the use of robotics in the modern era.

The complications of haemorrhage, post-operative tetany and injury to the recurrent laryngeal nerve abound previously, are a rare occurrence now. Since these complications have been minimised the main focus is now on cosmesis and thus 'scarless' thyroid surgery. The endoscopic thyroid surgery has been in practice since 1996.[2] The endoscopic approaches can be classified as direct, wherein the access is via an incision over the neck, and the remainder of the surgery is carried using endoscopic instruments and indirect (extra-cervical) which include the trans axillary, postauricular, areolar and transoral approaches. The direct approach, since it involves an incision over the neck, is not truly scarless.

The trans axillary, postauricular, and areolar approaches although leaving no visible scar, involve a significant extent of dissection to reach the site of pathology.[3] The transoral approach, on the other hand, is truly scarless and involves minimal dissection thus emerging as the most feasible option amongst all described previously. Here we present our early experience of cases of transoral thyroidectomy done by the vestibular approach.

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Table I: Details of the patients selected for transoral thyroidectomy

PATIENT	AGE/SEX	FINE NEEDLE ASPIRATION CYTOLOGY (BETHESDA)	ULTRASONOGRAPHIC FINDINGS	THYROID FUNCTION TEST
1	19/Female	Grade II	3.0 x 2.5 x 1.7 cm nodule in Left lobe	Within Normal Limit
2	22/Female	Grade II	4.0 x 2 x 2.2 cm nodule in Right lobe	Within Normal Limit
3	26/Female	Grade IV	3.3 x 2.4 x 2.5 cm nodule in Right lobe	Within Normal Limit

Materials and Methods

The procedure was done on three selected patients in the department of ENT and Head and Neck surgery in our hospital. (Table I)

Pre-operative preparation:

Adequate oral hygiene was ensured for all patients. Oral chlorhexidine gargles was advised. Prophylactic intravenous antibiotics (Cefotaxime and Metronidazole) were started the day prior to surgery and an Informed consent was taken.

Procedure:

The procedure was carried under general anaesthesia using Nasotracheal intubation with north pole endotracheal tube. The patients were positioned supine with an extension of the neck to have the chin and the thyroid cartilage at the same level.

The oral cavity was rinsed with chlorhexidine mouth wash. Local infiltration using 1:100000 saline-adrenaline solution was given at the oral vestibule. A 3cm incision was made just above the lower fornix vestibuli. Dissection was continued in the subcutaneous plane till the mandible. A subplatysmal plane was created using a blunt dilator from the mandible to the suprasternal notch, and a 10mm trocar was inserted. 2 vertical incisions were given, one on each side of the central incision, each 5 mm in length and a 5 mm trocarwere inserted on each side. (Fig. 1)

A 30° telescope was introduced through the 10mm port, and the 5mm side ports were used for instrumentation. CO2 was insufflated at 6mmHg pressure. Externally a stitch was taken at the level of the hyoid to elevate the subcutaneous plane if required. The strap muscles were identified and retracted laterally. The affected lobe was devascularised and dissected laterally from the trachea-oesophageal groove using a Ligasure™ device. The isthmus was then separated from the underlying pretracheal fascia. The specimen was removed from the 10mm port using an endobag with a purse-string suture. After achieving haemostasis the strap muscles were

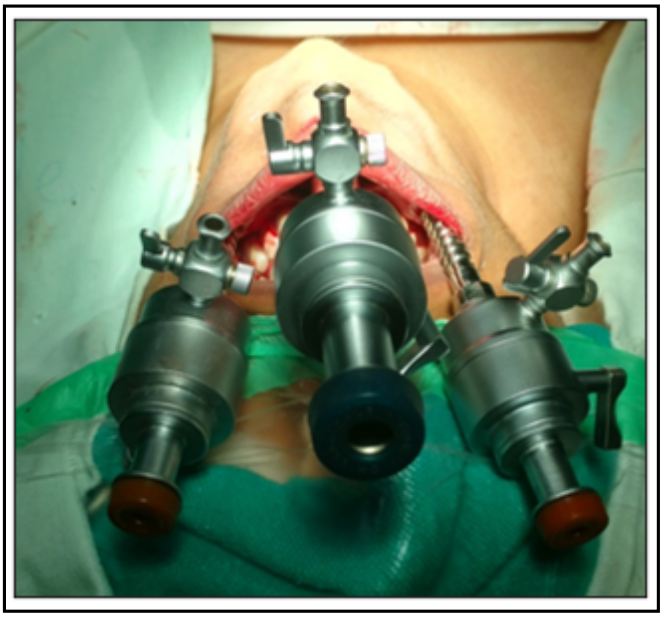

Fig. 1. Position of the telescope and side ports

Fig. 2. The sub-labial incision line in the post-op photograph

sutured using a V-Loc™ technique by 3-0 vicryl™. The sub labial incisions were sutured with 3-0 vicryl. (Fig.2)

Results:

Two out of 3 patients did not develop any complication. Intra-operative blood loss was minimal (less than 100cc). They were started on oral feeds on the same day. Post-operative pain was controlled adequately with intravenous analgesics. There was no evidence of recurrent laryngeal nerve or mental nerve injury. The patients did not develop any symptoms of hypocalcemia and the post-operative calcium was normal. They were discharged 4 days post-surgery. The patients felt satisfied with the surgery outcomes, especially the cosmetic result. (Fig.3)

One patient developed diffuse bleeding from the gland which could not be controlled. Thus, the decision was taken to convert it into an open procedure and the surgery was completed. The patient developed mild post-operative emphysema, however it spontaneously resolved within two days.

Discussion

The concept of natural orifice transluminal surgery (NOTES) for thyroid was developed by Witzel et al.[4] A single 10 mm incision was made in the sublingual area for the telescope and two 3.5 mm incisions were made externally at the neck for instrumentation. They performed endoscopic transoral thyroidectomy on 10 living pigs and no complications were reported. Wilhelm et al. then developed the endoscopic minimally invasive thyroidectomy (eMIT).[5] The centre port was a 10 mm port in the sublingual region and another 5 mm port was used at the oral vestibule. Of their 96 patients they had 1 transient RLN injury, 1 permanent RLN injury, 15 mental nerve injury, 6 infection, 3 conversion to open procedure. However, the sublingual approach involves violation of the floor of the mouth. On account of its technical difficulty and high complication rate, it has now fallen out of practice.

The oral vestibular approach was first described by Richmon et al.[6] They placed all ports in the oral vestibule thus eliminating the sublingual port. Since then, the transoral vestibular approach has been used across various centres worldwide. The largest series reported so far is by Anuwong et al of 60 patients. Their recommendation for transoral endoscopic thyroidectomy vestibular approach is for: (I) benign thyroid disease with small to moderate thyroid nodules; (II) thyroid cancer which has 1–2 cm cancer nodules, and (III) Grave's disease limited to 10 cm in size.[7]

The main concern regarding taking a transoral approach for thyroidectomy is the possibility of

Fig. 3. The cosmetic outcome

infection due to the commensals present in the oral cavity and injury to the mental nerve. However, our review of literature revealed that no such infection has been reported in any series. The injury to the mental nerve is avoided by staying in the subcutaneous plane and leaving adequate tissue on the mandible.

In our early experience we have found that accessing the gland, dissecting around the gland and achieving haemostasis with the right instruments is feasible. Retraction of the strap muscles to separate the lateral border of the gland is a surgical challenge and the external stitch taken in the neck is extremely useful to delineate the lateral border of the gland. Apart from cosmesis, the other advantage of this technique is better vision since the capsular dissection can be performed with a high definition camera system with better illumination and magnification.

Contra-indication of the procedure at present would be thyroid swellings with neoplastic etiology, whereas size of the swelling would be relative contraindication depending upon the experience of the author.

Conclusion

The transoral thyroidectomy by vestibular approach is feasible and promising, providing truly a 'scarless' and 'minimally invasive' approach. As the experience of the surgeons improve, we will be able to tackle larger swellings too in the future.

References

1. Hannan SA. The magnificent seven: a history of modern thyroid surgery. Int J Surg. 2006;4(3):187-91

2. Miccoli P, Ambrosini CE, Materazzi G, Fregoli L, Fosso LA, Berti P. New technologies in thyroid surgery. Endoscopic thyroid surgery. Minerva Chir. 2007; 62(5):335-49

3. Patel D, Kebebew E. Pros and Cons of Robotic Transaxillary Thyroidectomy. Thyroid. 2012; 22(10):984-5

4. Dio nigi G, Rovera F, Boni L. Commentary on transoral access for endoscopic thyroid resection : Witzel K, von Rahden BH, Kaminski C, Stein HJ. Transoral access for endoscopic thyroid resection. Surg Endosc. 2008; 22(8):1871-5. Surg Endosc. 2009 Feb 6 [cited 2017 Oct 30]; 23(2):454-5; discussion 456

5. Wilhelm T, Metzig A. Video. Endoscopic minimally invasive thyroidectomy: first clinical experience. Surg Endosc. 2010; 24(7):1757-8.

6. Richmon JD, Pattani KM, Benhidjeb T, Tufano RP. Transoral robotic-assisted thyroidectomy: A preclinical feasibility study in 2 cadavers. Head Neck 2010 Jul 13; 33(3):n/a-n/a.

7. Anuwong A, Kim HY, Dionigi G. Transoral endoscopic thyroidectomy using vestibular approach: updates and evidences. Gland Surg. 2017; 6(3):277–84.

Endoscopic Repair of Spontaneous CSF Rhinorrhoea: Results from 21 Cases

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ABSTRACT

Introduction

Surgery to close the skull base defect is the treatment of choice in persistent spontaneous cerebrospinal fluid rhinorrhoea with endoscopic endonasal repair being the method of choice. This study analysed the demographics of presentation, optimal diagnostic and localisation strategies and the effectiveness of transnasal endoscopic treatment strategies with post-operative follow-up of CSF rhinorrhoea patients in a tertiary care institution .

Materials and Methods

A prospective longitudinal study was conducted on 21 CSF rhinorrhoea patients operated on between August 2014 and August 2018 and results documented.

Results

CSF rhinorrhoea was found most commonly in middle aged female patients in our study. HRCT PNS was capable of identifying a leak site in 66% of the cases. All patients were operated endoscopically with no major intra-operative or post-operative complications. Resolution of CSF leak occurred in 85% of cases.

Conclusion

CSF rhinorrhoea can be diagnosed and endoscopic repair can be effectively performed in our existing tertiary care set-ups with good results.

Keywords

Cerebrospinal Fluid Rhinorrhea; Endoscopy

Cerebrospinal fluid (CSF) rhinorrhoea is a relatively rare but potentially dangerous condition characterised by the discharge of CSF from the nasal cavities. CSF is a clear watery fluid that circulates in the central nervous system in between the arachnoid and the pial layers and helps to cushion the brain and spinal cord from external shocks. Approximately 90 to 150 mL of CSF circulates in the CNS at any time.[1]

CSF rhinorrhoea can be spontaneous, traumatic, iatrogenic, or secondary to nasal and intracranial neoplasms.[2] Spontaneous cases of CSF rhinorrhoea are now considered to be a manifestation of benign intracranial hypertension (BIH), and hence present most commonly in obese middle aged women; however, they may be due to focal atrophy and rupture of arachnoid tissue associated with olfactory nerves and persistence of an embryonic olfactory lumen.[3]

The underlying aetiology in all kinds of CSF rhinorrhoea is thus a disruption of the fibres of the dura and the arachnoid, coupled with an osseous skull base defect. This defect also forms the route of entry of pathogens into CNS, and thus may cause significant morbidity in patients due to recurrent episodes of meningitis.

Surgery to close the skull base defect is often the treatment of choice in more severe cases with endoscopic endonasal repair the method of choice. Wigand in 1981 reported the first case of endoscopic repair of CSF rhinorrhoea.[4]

The aim of the present article is to describe the demographics of presentation, optimal diagnostic and localisation strategies and the effectiveness of transnasal endoscopic treatment strategies with post-operative follow-up of CSF rhinorrhoea patients in the setting of a single tertiary care institution.

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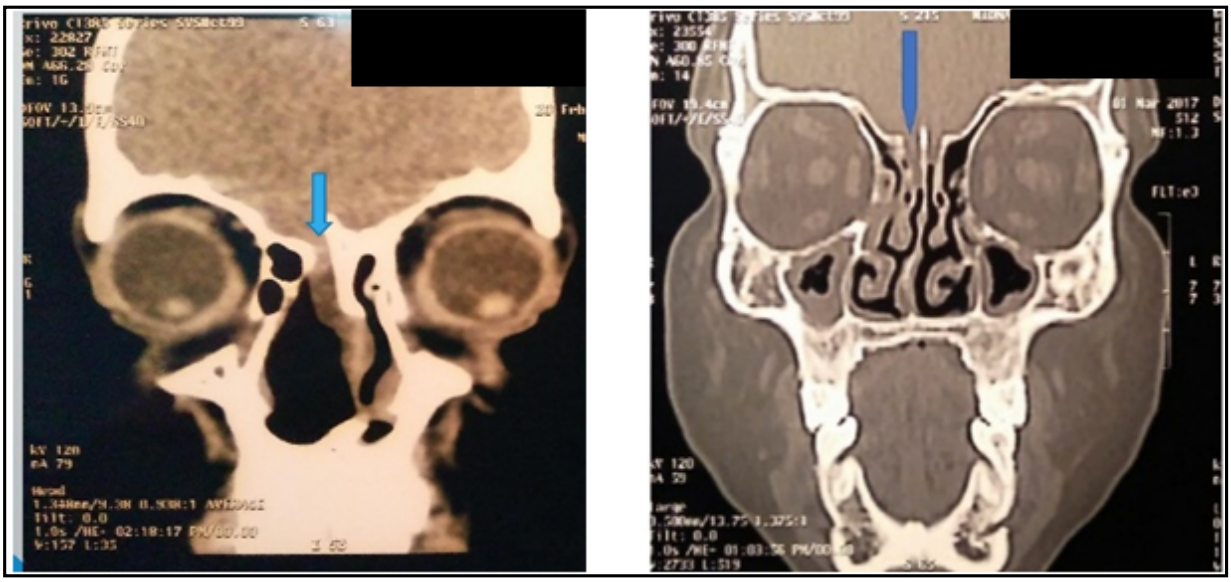

Fig. 1. Representative HRCT PNS images showing medial lamellar leak in two different patients.

Materials and Methods

We included 21 patients of spontaneous CSF rhinorrhoea diagnosed based on clinical, biochemical and radiological work-up and treated by endoscopic repair, in a single tertiary care institution between August 2014 and August 2018. Cases of traumatic, iatrogenic, neoplastic and congenital origin were excluded from the study.

Clinical work-up: All demographically important details of the patients including age, sex, place of residence, etc. were recorded. This was followed by a thorough history taking and complete ENT and head and neck examination. Important clinical features included unilaterality, reservoir sign and exacerbation with straining. CSF rhinorrhoea could be precipitated by Valsalva manoeuvre and Queckenstedt test (application of digital pressure on bilateral internal jugular vein at the root of the neck) in many cases.

Biochemistry: CSF collected in test tubes were sent for biochemical analyses such as glucose and chloride content and beta-2-transferrin assay. Typical range for glucose level is 45 to 80 mg/DL while that for chloride level is 116 to 127 mmol/L. Beta-2-transferrin assay facility was unavailable for all cases due to infrastructure problems. Hence, with a thorough clinical and radiological workup, CSF glucose and chloride levels were considered enough for diagnosis.

Radiological work-up: High resolution computed tomographic (HRCT) scan of paranasal sinuses (PNS) with 1 mm section was done in all cases (Fig. 1). CT cisternography was done in cases where CSF leak site could not be located on HRCT PNS. Magnetic resonance imaging (MRI) PNS was done to identify meningoencephaloceles. Additionally, MRI brain was also done in cases of suspected intracerebral neoplasms as is usually the practice.

Operative interventions and post-op care: All patients were treated endoscopically with an endoscopic nasal examination used to determine the site of leak followed by repair with fat and fascia graft (Figs. 2, 3). An underlay technique was used in all cases. Surgicel® packing was used to stabilise site of repair. Post-operatively, patients were put on laxatives, antitussives, diuretics and mannitol. All patients were followed up at 1 month and 6 months.

Results

Age-sex distribution:

In our study, patients were classified based on sex (male, female, other) and age group (0-20 years, 20-40 years, 40-60 years and >60 years). A salient finding of

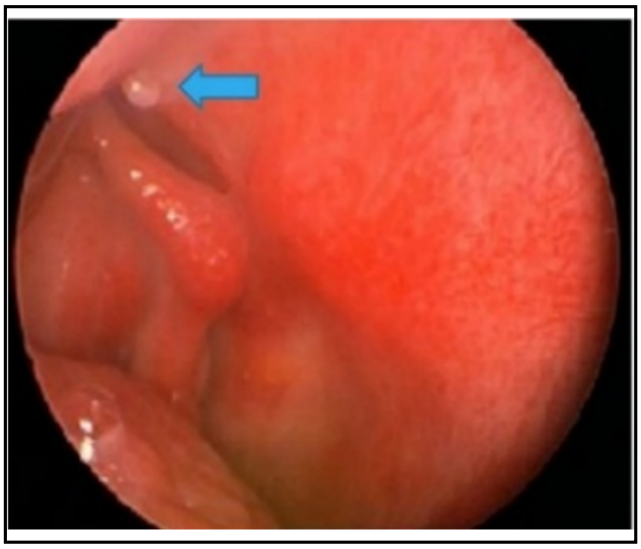

Fig 2. Endoscopic image showing the site of a meningocele

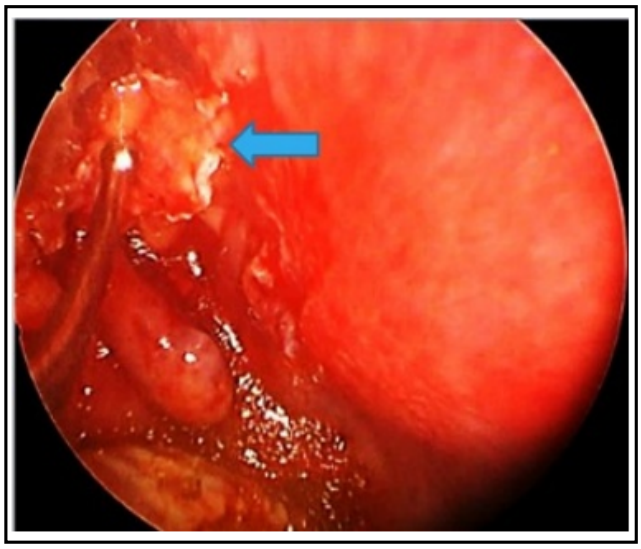

Fig 3. Endoscopic image of CSF leak site after repair with a fat graft.

this study is that majority of the patients were middle-aged female patients. Female patients in 20-40-year group formed 28.57% while female patients in 40-60-year group formed 23.60% of the total study population (n=21) (Table I).

Diagnostic results of different imaging modalities: HRCT PNS with 1mm cuts was done in all cases and was able to identify a leak site in 66.67% of the cases. MRI PNS and CT cisternography were done in only select cases and had diagnostic yield of 14.28% and 28.57% respectively. The various sites of CSF leak identified are shown in Table II. Cribriform plate was the most common site at 57.14%.

Post-operative findings:

Post-operative follow-up was done at 1 month and 6 months. Recurrence of CSF leak was noted in 4.76% at 1 month and 14.28% at 6 months. Thus 85.72% of patients in our case series were deemed to be free of recurrence at 6 months follow-up.

Discussion

This is a descriptive study involving 21 patients of CSF rhinorrhoea over a 4-year period from 2014 to 2018 at a tertiary care hospital in eastern India. While the study suffers from the limitation of a relatively small sample size, the results obtained were compared to similar studies in scientific literature.

Women in 20-60-year age group accounted for about 52% of the patients in our study. This is in accordance with the well-known association of CSF rhinorrhoea with middle aged women. A systematic review of existing literature by Lobo et al found similar increased incidence in the middle age group women compared to men.[5]

As far as diagnosis and localisation of CSF leak site was concerned, various imaging modalities including HRCT PNS, CT cisternography, and radionuclide imaging studies have been recommended by authorities. However, a consensus is emerging that HRCT PNS followed by operative exploration in active cases, and MR cisternography additionally in inactive cases form the safest and most cost-effective strategies for diagnosis and localisation.[6,7] In our study, HRCT PNS with 1 mm cuts was able to localise a leak site in 66.67% of the cases. A study by Stone et al, in 1999, reported identification of CSF leak site on HRCT PNS in 71% of cases and suggested that CT cisternography may be reserved for patients in whom HRCT could not identify the leak site.[8] Our study thus shows a comparable result

Table I: Age-sex distribution of the study population

AGE GROUP/ SEX	<20Y	20-40Y	40-60Y	>60Y
Male	1(4.76%)	1 (4.76%)	2 (9.52%)	2 (9.52%)
Female	2(9.52%)	6 (28.57%)	5 (23.80%)	2 (9.52%)

as far as diagnosis and localisation is concerned.

Endoscopic transnasal repair with fat and fascia lata graft harvested from the thigh was used in all cases. Patients were then asked to follow up in outpatients regularly at 1 month and 6 months, as well as on emergent basis, if required.

Our study on 21 patients had a success rate of 85.72% at 6 months' follow-up. This was comparable with case series published by many authors. Lee et al, in 1994, reported a success rate of 92% in a case series of 39 patients with the endoscopic endonasal technique.[9] A large number of other single institution based studies[10,11] as well as a meta-analysis by Hegazy et al[12] have shown similar high efficacy rates using the endoscopic transnasal repair technique.

Conclusion

While the efficacy and high success rates of endoscopic transnasal repair technique of CSF rhinorrhoea have been established beyond doubt by many studies, the optimal diagnostic and treatment strategies for CSF rhinorrhoea is still a topic of active research. As most of these studies are single institution-based experiences with small sample sizes, there is a need for further research in this area focusing on comparative outcomes in terms of cost-effectiveness, long-term safety and efficacy of various treatment modalities. The present study also suffers from similar limitations.

However, several systematic reviews and meta-analyses are now available focusing on epidemiologic factors, co-morbidities, diagnosis and localisation as well as treatment strategies for CSF rhinorrhoea. Based on these studies, it may be safely concluded that spontaneous CSF rhinorrhoea can be easily diagnosed in any modern tertiary care ENT outpatients setting on clinical and radiologic grounds with HRCT-PNS as the first-choice radiological investigation. Furthermore, this clinical entity can also be safely treated by an ENT surgical team using an entirely endoscopic transnasal approach. Endoscopic transnasal repair has proven to be highly successful and should now be considered as the standard of care in spontaneous CSF rhinorrhoea for cases not responding to conservative methods.

Table II: Distribution of site of CSF leak localised by radiographic studies

SITE OF CSF LEAK	NUMBER OF PATIENTS (N=21)
Medial lamella	12 (57.14%)
Lateral lamella	7 (33.33%)
Frontal sinus	1 (4.76%)
Sphenoid sinus	1 (4.76%)

References

1. Han CY, Backous DD. Basic principles of cerebrospinal fluid me-tabolism and intracranial pressure homeostasis. Otolaryngol Clin North Am. 2005; 38:569-76
2. Har-El G. What is "spontaneous" cerebrospinal fluid rhinorrhea? Classification of cerebrospinal fluid leaks. Ann Otol Rhinol Lar-yngol. 1999; 108:323-6
3. Rodney J, Wilensky, Maloney E, Grady MS, Bolger, William E. El-evated intracranial pressures in spontaneous cerebrospinal flu-id leaks. Am J Rhinol. 2003; 17:191-5
4. Wigand ME. Transnasal ethmoidectomy under endoscopical control. Rhinology 1981; 19:7-15
5. Lobo BC, Baumanis MM, Nelson RF. Surgical repair of spontane-ous cerebrospinal fluid (CSF) leaks: A systematic review. Laryn-goscope Investig Otolaryngol. 2017; 2(5):215-

24

6. Vemuri NV, Karanam LS, Manchikanti V, Dandamudi S, Puvvada SK, Vemuri VK. Imaging review of cerebrospinal fluid leaks. Indi-an J Radiol Imaging. 2017; 27: 441
7. Pool CD, Patel VA, Schilling A, Hollenbeak C, Goyal N. Economic implications of localization strategies for cerebrospinal fluid rhinorrhea. Int Forum Allergy Rhinol. 2019 Dec 12.
8. Stone JA, Castillo M, Neelon B, Mukherji SK. Evaluation of CSF leaks: high-resolution CT compared with contrast-enhanced CT and radionuclide cisternography. AJNR Am J Neuroradiol. 1999; 20:706-12
9. Lee TJ, Huang CC, Chuang CC, Huang SF. Transnasal endoscopic repair of cerebrospinal fluid rhinorrhea and skull base defect: ten-year experience. Laryngoscope 2004; 114:1475-81
10. Kirtane MV, Gautham K, Upadhyaya SR. Endoscopic CSF rhinor-rhoea closure: Our experience in 267 cases. Otolaryngol Head Neck Surg. 2005;132:208-12
11. Banks CA, Palmer JN, Chiu AG, O' Malley BW Jr, Woodworth BA. Endoscopic closure of CSF rhinorrhoea: 193 cases over 21 years. Otolaryngol Head Neck Surg. 2009;140:826-33
12. Hegazy HM, Carrau RL, Snyderman CH, Kassam A, Zweig J. Transnasal endoscopic repair of cerebrospinal fluid rhinorrhea: A meta-analysis. Laryngoscope 2000;110:1166-72.

Endoscopic Excision of Juvenile Nasopharyngeal Angiofibroma: Case Series of 20 Patients

Monil Parsana,[1] Kalpesh Patel,[1] Abhishek Gugliani[1]

ABSTRACT

Introduction

Juvenile Nasopharyngeal Angiofibroma (JNA) is a highly vascular, benign, locally aggressive tumour of the nasopharynx. Endoscopic approach is the current accepted modality for the excision of Juvenile Nasopharyngeal Angiofibroma. The current study was undertaken to assess the outcome of this procedure at our institute.

Materials and Methods

A total of 20 patients of JNA at a medical college in Ahmedabad between the period of July 2015 to July 2017 were included. The tumour was staged according to Fisch system and clinical presentation, local examination, nasal endoscopy findings, radiological findings, approach of surgical resection, complications and recurrence were noted.

Results

We found that endoscopic approach for the excision of juvenile nasopharyngeal angiofibroma is safe and effective technique associated with reduced post operative morbidity and low recurrence rates.

Conclusions

JNA is a rare but a potentially life-threatening disease. All young males presenting with profuse, spontaneous and recurrent epistaxis should be evaluated for JNA. Endoscopic approaches have become the procedure of choice for resection of these tumours.

Keywords

Nasopharyngeal Neoplasms; Angiofibroma; Endoscopy

Juvenile Nasopharyngeal Angiofibroma (JNA) is a highly vascular, benign, locally aggressive tumour of the nasopharynx. It accounts for 0.5% of all head and neck neoplasms. It occurs typically in male adolescents in the age group of 9 to 19 years.[1] Nasal obstruction and epistaxis are the most common presentation but those with advanced stages may present with facial swelling or disturbances in vision.[2] Based on the extent of tumour, several staging systems have been proposed but there is no universally adopted system.[3] Surgical resection of the tumour is the accepted treatment modality.[4] Based on the size, location and the extent of the tumour, multiple surgical approaches have been proposed. Trans-nasal endoscopic excision is an established modality and is associated with decreased morbidity.[5] We present a case series of twenty patients of JNA who underwent endonasal endoscopic resection.

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Materials and Methods

This is a prospective hospital-based study and was approved by the Institution Ethical Committee. A total of 20 patients of JNA presenting to the Department of E.N.T. between the period of July 2015 to July 2017 were included in the study after taking a written informed consent. All of them were operated by the same surgeon. Those patients, who were diagnosed to have malignant nasal tumours or with allergic or infective nasal pathologies, and patients who did not give consent for the study, were excluded from the study.

Table I: Comparison of Male preponderance in JNA

SEX	OUR STUDY	GHOSH ET AL. [6]	MISTRY ET AL. [7]
Male	**100%**	**100%**	**100%**
Female	**0**	**0**	**0**

The tumour was staged according to Fisch system and basic characteristic (age), clinical presentation, local examination, nasal endoscopy findings, computer tomography and/or magnetic resonance imaging scan findings, approach of surgical resection, complications and recurrence were noted.

Results

A total of 20 cases were included in this study. The maximum and minimum age of presentation were 20 years and 12 years (Mean age 15.65 ± 2.62 years). All patients were male. (Table I)

The presenting complaints are shown in Fig. 1.

A diagnostic nasal endoscopy was performed in all cases. JNA appears as a red fleshy mass with irregular vessels on its surface. (Fig. 2) All patients underwent a contrast enhanced computed tomography (CECT) scan to know the extent of the disease tic resonance imaging (MRI) scan was performed in 3 cases with patients having intracranial extension. The tumour was staged according to Fisch staging. 2 cases (10%) were staged as grade I, 7 cases (35%) as grade II, 8 cases (40 %) as grade III and remaining 3 cases (15 %) as grade IV. We compared our findings with a similar study by M Jacobson et al. (Table II)

All patients underwent trans nasal endoscopic resection of tumour while 1 case with stage IV was managed by open approach of mid facial degloving along with endonasal endoscopic approach for complete removal of the tumour. External carotid artery ligation of the ipsilateral side was done in 7 patients (4 with

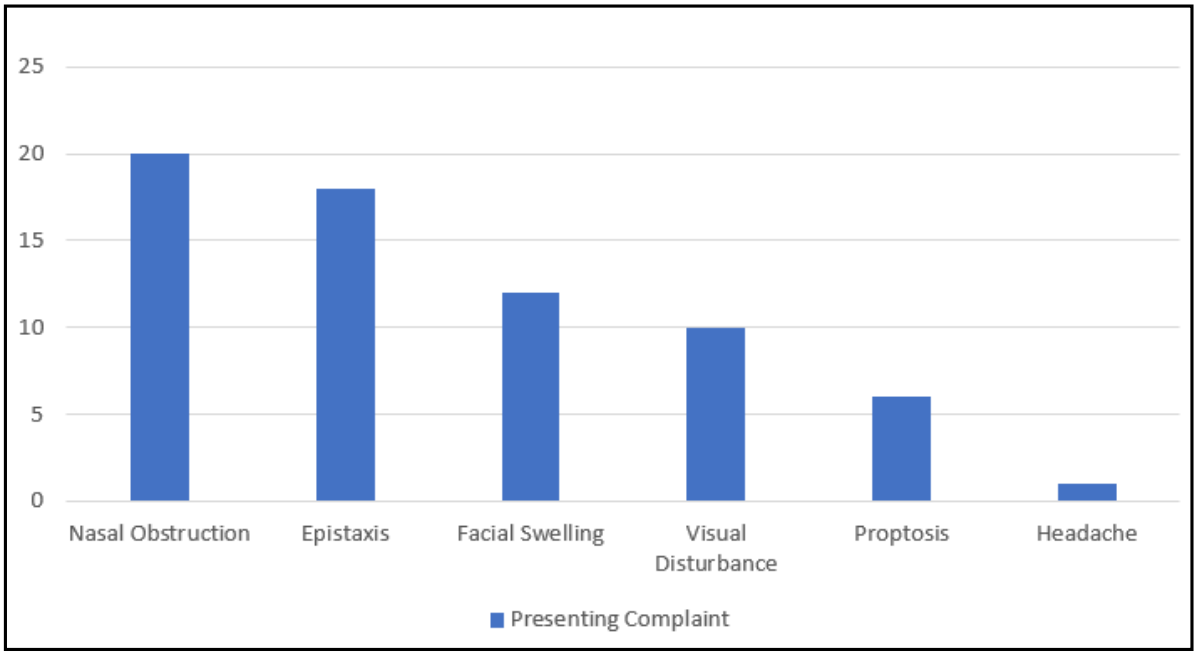

Fig. 1. Presenting complaint of patients

Table II: Staging of the tumour at presentation

FISCH STAGE	OUR STUDY (%)	M JACOBSON ET AL (%) [8]
I	10%	11.10%
II	35%	35.35%
III	40%	40.40%
IV	15%	5%

stage III and 3 with stage IV).

Postoperatively, they were followed up for a period of 6 months with nasal endoscopy at 1 month, 3 months and 6 months and a CECT scan at end of 6 months to look for any residual or recurrence of tumour. We did not encounter any recurrence of tumour in our study at 6 months of follow up.

Discussion

JNA affects adolescent males and is thus believed to be testosterone dependent. The peak age of presentation is about 14 years. Only 28 female cases have been reported in the literature.[9] The site of origin is the posterolateral wall of the roof of nose, in the region of pterygopalatine fossa at the level of vidian canal aperture.[10] It follows the path of least resistance and from the pterygopalatine fossa, it can grow medially to the nasopharynx, nasal cavity and towards the contralateral side. Laterally it can extend to the sphenopalatine and infratemporal fossa, via the pterygomaxillary fissure. Posteriorly, it can reach the internal carotid artery through the vidian canal, the cavernous sinus through the foramen rotundum and the orbital apex through the inferior orbital fissure. The blood supply of JNA is by the internal maxillary artery, the ascending pharyngeal artery or the ascending palatine artery of the ipsilateral side.[11,12]

Histologically, it is characterized by irregular vessels ranging from capillary and sinusoidal-type vessels to muscular vessels set in a fibrous stroma.[13] Surgical resection of the tumor is considered the treatment of choice although spontaneous regression of the tumor has been reported.[14] Various surgical procedures include transpalatal technique, lateral rhinotomy, midfacial degloving, infratemporal approach etc.[15]

Reports of endoscopic resection of the tumor were published from Barcelona in 1993.[16] Since then, with advances in the imaging techniques and better quality of endoscopes, the endonasal endoscopic technique for the resection of the tumor has gained popularity. It is associated with reduced mortality and low recurrence rates.

Nasal obstruction and epistaxis are the most common presenting complaints of patients with JNA. All young adolescent males presenting with a history of recurrent, spontaneous, profuse epistaxis should be evaluated for

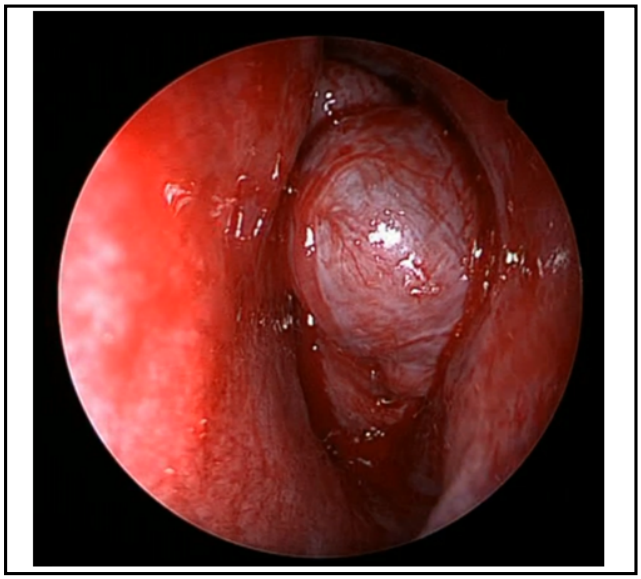

Fig. 2. Endoscopic picture of JNA in left nasal cavity

JNA. Nasal endoscopy and CECT are usually sufficient for diagnosis.[17] MRI scans may be required to assess the intracranial or intra-orbital extension of the tumor. Regular follow up is needed to assess the recurrence of the disease.

Conclusion

JNA is a rare but a potentially life-threatening disease. All young males presenting with profuse, spontaneous and recurrent epistaxis should be evaluated for JNA. A vascular nasal mass on endoscopy should raise suspicion and followed up with radiological scans. Endoscopic approaches have become the procedure of choice for resection as they have proven to be an effective alternative to the external techniques for the management of JNAs.

References

1. Chandler JR, Goulding R, Moskowitz L, Quencer RM. Nasopharyngeal angiofibromas: Staging and management. Ann Otol Rhinol Laryngol. 1984; 93:322-9
2. El Sharkawy AA, Elmorsy SM. Transnasal endoscopic management of recurrent juvenile nasopharyngeal angiofibroma. Int J Pediatr Otorhinolaryngol. 2011; 75:620-3
3. Blount A, Riley KO, Woodworth BA. Juvenile nasopharyngeal angiofibroma. Otolaryngol Clin North Am. 2011; 44:989-1004
4. Marshall AH, Bradley PJ. Management dilemmas in the treatment and follow-up of advanced juvenile nasopharyngeal angiofibroma. ORL J Otorhinolaryngol Relat Spec. 2006; 68:273-8
5. Douglas R, Wormald PJ. Endoscopic surgery for juvenile nasopharyngeal angiofibroma: where are the limits? Curr Opin Otolaryngol Head Neck Surg. 2006; 14:1-5
6. Ghosh B, Saha S, Chandra S, Nandi TK, Bera SP. Juvenile nasopharyngeal angiofibroma-three years experience. Indian J Otolaryngol Head Neck Surg. 2003; 55(4):228-33. doi:10.1007/BF02992425.
7. Mistry RC, Qureshi SS, Gupta S, Gupta S. Juvenile nasopharyngeal angiofibroma: A single institution study. Indian J Cancer 2005;42:35-9
8. Jacobsson M., Petruson B., Svendsen B., et al. Juvenile nasopharyngeal angiofibroma:A report of eight cases. Acta Otolaryngol. 1988; 105:132-9
9. Gruber B, Kron TK, Goldman ME, Matz G. Nasopharyngeal angiofibroma in two young children. Otolaryngol Head Surg. 1985; 93 (6): 803
10. Maroldi R, Nicolai P. Imaging in Treatment Planning for Sinonasal Diseases, Springer, New York, NY, USA, 2004
11. Lloyd G, Howard D, Lund VJ, Savy L. Imaging for juvenile angiofibroma. J Laryngol Otol. 2000; 114(9):727-30
12. Schick B, Kahle G. Radiological findings in angiofibroma. Acta Radiologica 2000; 41(6):585-93
13. Behman A, Regauer S, Behman-Schmid C, Kainz J, Stammberger H. Expression of CD34-antigen in nasopharyngeal angiofibroma. Int J Pediatr Otorhinolaryngol. 1998; 44:245-50
14. Stansbie JM, Phelps PD. Involution of residual juvenile nasopharyngeal angiofibroma. J Laryngol Otol. 1986; 100:599-603
15. Hofmann T, Bernal-Sprekelsen M, Köele W, Reittner P, Klein E, Stammberger H. Endoscopic resection of juvenile angiofibromas--long term results. Rhinology 2005; 43(4): 282-9
16. Anderhuber W, Stammberger H, Watch Ch, Fock CH, Regauer S, Luxenberger W, Gotschuli A. Rigid endoscopy in minimally invasive therapy of tumors of the paranasal sinuses and skull base. Min Invas Ther & Allied Technol. 1999; 8:25-32
17. Jacobsson M, Petruson B, Svendsen P, Berthelsen B. Juvenile nasopharyngeal angiofibroma: A report of eight cases. Acta Otolaryngol. 1988; 105:132-9.

Case Report

Schwannoma of the Submandibular Gland

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ABSTRACT

Introduction

Mesenchymal tumours of submandibular gland are extremely rare. Schwannoma of the salivary glands is a particularly rare form of an extracranial neurogenic tumour.

Case Report

Here, we present an unusual case of schwannoma of submandibular gland in a 16 year old girl, who underwent total excision of mass with submandibular gland excision with no cranial nerve deficits. The details of the histopathologic features are present .

Discussion

Schwannoma of the salivary gland is a particularly rare form of an extracranial neurogenic tumour. Our case indicates good prognosis in a case of submandibular gland schwannoma after surgical excision.

Keywords

Submandibular Gland; Neurilemmoma; Schwannoma

Schwannomas are benign, solitary and well differentiated neurogenic tumour derived from Schwann cell of the neural sheath.[1] Schwannoma is not a common tumour of the salivary gland .Nearly 25-45% of all schwannomas occur in the head and neck area. Schwannomas are usually, unilocular, cystic, symptomless, slow growing, benign, solitary, encapsulated tumours that are attached or surrounded by a nerve. They appeared to push the nerve axions and can often be dissected free,with preservation of the nerve of origin. Histologically, classic schwannomas are characterised by two distinct patterns showing cellular areas of spindle cells with nuclear pallisading (Antoni A) and spindle cells scattered in a delicate, fibrillar microcystic matrix (Antoni B).[2] The histological forms of schwannoma are ancient, cellular, epitheloid, hybrid, melanotic, plexiform and psammomatous variants.[3]

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Schwannoma also known as neurilemmoma was first described by Verocay et al.[4] In the present report we describe a case of Schwannoma of the left submandibular gland with the image and histological findings .

Case Report

A 16 year old girl was admitted to our hospital with a painless swelling on the left side of the neck for past two months. A thorough physical examination of neck revealed a smooth surface, mobile, firm and painless mass of approximately 5cms in its greatest diameter in left submandibular region, there was no cervical lymphadenopathy. All the cranial nerve examination were normal and ultrasound examination of neck revealed a well circumscribed and heterogenous mass. Pre operative fine needle cytology of the mass was suggestive of chronic sialadenitis. CECT of the neck was done which was suggestive of the encapsulated well circumscribed spherical mass lesion 4.5x3x3 cm mass with heterogenous opacity in the left submandibular region.The mass was located lateral to genioglossus muscle and the sub mandibular gland was compressed and inferiorly displaced. Contrast enhancement demonstrated weak enhancement with no evidence of cystic or necrotic

Fig.1. Intra operative picture showing tumour mass attached to left submandibular gland.

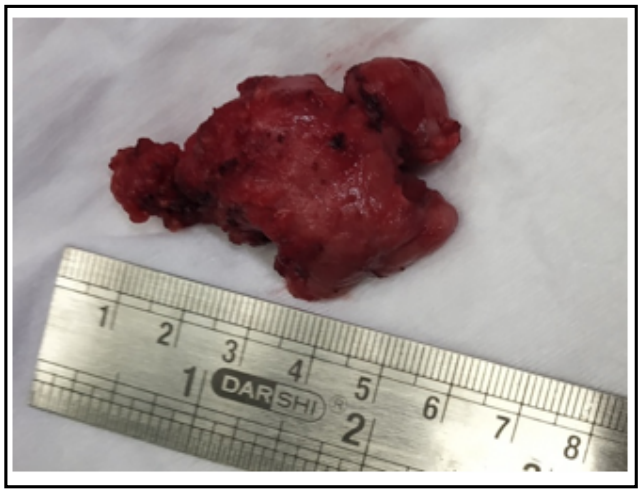

Fig. 2. Excised specimen tumour attached to submandibular gland.

degeneration. After the initial evaluation the patient was prepared for surgical evaluation and resection with a presumptive diagnosis of benign tumour of left submandibular gland. The tumour mass was abutting the left submandibular gland and was not attached to any nerves. (Fig. 1) The mass was carefully dissected from the adjacent structures. The lesion was excised completely with the submandibular gland.

Macroscopically the resected mass was encapsulated yellowish in colour; measuring 6 cms. It was oval smooth, firm, fleshy. (Fig. 2) Patient had an uneventful postoperative recovery. Total excision resulted in complete recovery of symptoms with no cranial nerve deficits.Histopathological examination revealed a well encapsulated tumour with alternating hypercellular Antoni A and hypocellular Antoni B areas.(Fig.3) Antoni A areas composed of spindle cells with twisted nuclei and indistinct cytoplasmic borders. Many verocay bodies formed by two compact row of well aligned nuclei separated by fibrillary cell process. (Fig.4) Antoni B areas are hypocellular with loose fibromyxoid change.

Discussion

Neurogenic tumours arise from the neural crest which differentiates into the Schwann cells and sympathicoblasts.[5] The Schwann cells give rise to neurofibroma and neurilemmoma (Schwannoma).[6] Schwannoma is a slow growing solitary and encapsulated tumour attached to a nerve. Schwannoma may arise from any cranial nerve or spinal nerve that has a sheath. Schwannomas occur in the head and neck .The common sites of extracranial neurilemmoma in head and neck are parapharyngeal space, submandibular space, paranasal sinuses, cheek and oral cavity.[7] Batsakis reported that in the neck the schwannomas can be divided into medial and lateral group, on the basis of nerve of origin. The medial group arises from last four cranial nerves and the cervical sympathetic chain, the lateral group arises from cervical trunk.[8]

Mesenchymal neoplasms are rare in the salivary glands, representing only 2-5% of salivary gland tumours.[2] Schwannoma in particular are rare in the submandibular gland. After Attie et al,[9] described a case of Schwannoma arising from lingual nerve and Sutay et al[10] reported a Schwannoma originating from hypoglossal nerve.Sato et al[11] published first case of parasympathetic schwannoma of submandibular gland.

A salivary gland tumour of mesenchymal origin usually presents as an asymptomatic, slow growing, well circumscribed mass in the submandibular region. Radiological investigations like contrast enhanced computer tomography is required and MRI may be necessary in a few cases. Our patient underwent preop CECT which revealed well circumscribed spherical

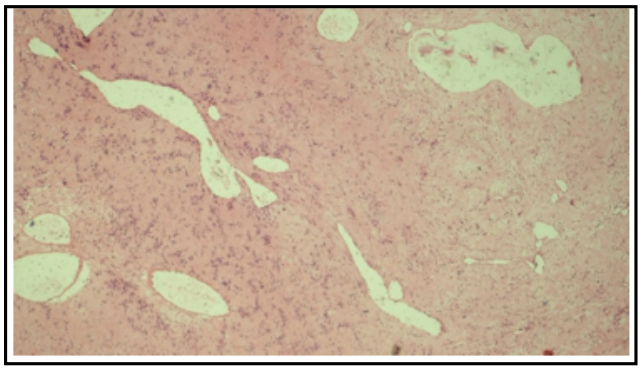

Fig.3. Histopathology of schwannoma showing Antoni A and Antoni B cells (H&E, 4X)

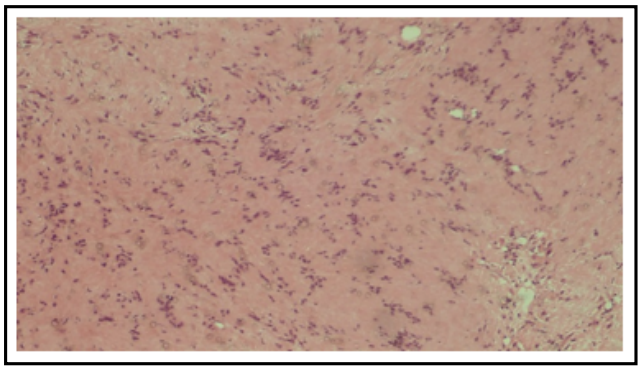

Fig.4. Antoni A areas with nuclear palisading and verocay bodies (H&E, 10X)

mass with mixed attenuation in the left submandibular region, the mass was lateral to the hyoglossus muscle and the submandibular gland was compressed and inferiorly displaced.There was no evidence of cystic or necrotic degeneration.MRI was not advised as it is not a routine diagnostic aid however, MRI with gadolinium is the better choice because it can diagnose even small intra glandular nerve cell tumour. In head and neck schwannomas fine needle aspiration biopsy is of questionable value, as it may show unclear histopathological results from these cases, which have the potential to confuse this lesion with a more serious one such as sarcoma.[12] Even in the present case FNAC was suggestive of chronic sialadenitis.

The size of Schwannoma arising in the submandibular glands range from 1 to 6 cm in diameter, in our case measured approximately 4.5x3x3 cm. The swelling is most often freely mobile and may be fusiform in shape, but when it is connected to a large nerve or nerve trunk there may be restriction of movements.

Schwannoma shows characteristic histological appearance, dominated by an encapsulated lesion arising from a nerve composed of an intimate mixture of spindle cells forming highly cellular so called Antoni type A areas and less cellular, myxoid Antoni type B. Between palisades of Antoni type A cells are regions that are devoid of nuclei termed verocay bodies, after the person who described schwannomas.The present case contained a mixture of Antoni type A and Antoni type B, Antoni type A being the predominant microscopic pattern. The Antoni A and Antoni B are used for pathological determination of the tumour and have no clinical significance. Even though the histological features of Schwannoma are quite characteristic and can be diagnosed light microscopically, in certain problematic cases, immunoperoxidase and ultrastructural studies may be needed. Immunohisochemical evaluation of schwannomas for S100 protein provides consistently positive results, especially in Antoni type A areas.

The treatment of choice for schwannomas are complete surgical excision with preservation of nerve function.Recurrence is uncommon. In our case the patient underwent submandibular gland excision with excision of tumour mass. The patient is on follow up for last 1 year.

References

1. Aslan G, Cinar F, KuskolCabuk F. Schwannoma of the submandibular gland a case report. Journal of Medical Case Reports 2014;8:23
2. Lau RP, Melamed J, Yee-Chang M, Marcus S, Givi B, Zamuco R. Microcystic/reticular schwannoma arising in the submandibular gland: A rare benign entity that mimics more common salivary gland carcinomas. Head Neck Pathol. 2016; 10(3):374-78. doi:10.1007/s12105-015-0674-5
3. Kurtkaya-Yapicier O, Scheithauer B, Woodruff JM. The pathobiologic spectrum of Schwannomas. Histol Histopathol. 2003; 18(3):925–934. doi:10.14670/HH-18.925
4. Bansal V, Agarwal P, Wadhwan V, Bansal A, Kapoor S. Giant solitary schwannoma of submandibular gland-A rare entity. Journal of maxillofacial oral Surgery 2017;16(3)382-6
5. Bamgbose BO, Sato A, Yanagi Y, Hisatomi M, et al. A case of schwannoma of the submandibular region. Open Dent J. 2018;

12:12-8. doi:10.2174/1874210601812010012

6. Maran AGD. Benign diseases of the neck. In: Kerr AG.editor. Scott-Brown's Otolaryngology 5th Ed. London: Butterworths; 1987
7. Muranjan SN, Jagasia V, Pusalkar A. Schwannoma of the cheek, Indian J Otolaryngol Head Neck Surg. 2001;53(2):140-1
8. Sharma DK, Sohal BS, Parmar TL, AroraH. Shwannomas of Head and Neck and Review of Literature.Indian J Otolaryngol Head Neck Surg. 2012; 64(2):177-80. DOI 10.1007/s12070-011-0248-0
9. Attie JN, Friedman E, Rothberg MS. Submandibular and axillary schwannomas not associated with von Recklinghausen's disease, J Oral Maxillofac Surg. 1984;42:391-4
10. Sutay S, Tekinsoy B, Ceryan K, Aksu Y. Submaxillary hypoglossal neurilemmoma. J Laryngol Otol. 1993;107:953-4
11. Sato J, Himi T, Matsui T. Parasympathetic Schwannoma of Submandibular gland. Auris Nasus Larynx 2001; 28:283-5
12. Weiss SW, Glodblum JR. ParotisSchwannoma.In: EnzingerFM,Weiss SW(eds) EnzingerandWeisss soft tissue tumours,4thednMosby,Saint Louis Missouri, 2001.pp 1146-67.

Case Report

Pleomorphic Undifferentiated Sarcoma (Malignant Fibrous Histiocytoma) of True Vocal Fold: A Rare Laryngeal Malignancy

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ABSTRACT

Introduction

Pleomorphic undifferentiated sarcoma also known as Malignant fibrous histiocytoma, is a malignanat tumour which commonly involves upper and lower extremities and the retroperitoneum. Only a few sporadic MFHs located in the head and neck have been reported in the literature. Rarely the tumor can involve larynx. Complete excision of the tumor is the standard treatment but post-operative chemotherapy and / or radiotherapy is also recommended in selected cases.

Case Report

We present a rare case report of pleomorphic undifferentiated sarcoma also known as malignanat fibrous histiocytoma of true vocal fold in a 65 years old male patient. The patient presented to us with complaints of change in voice for past 3 months. He also reported about his smoking habits for past 35 years. On detailed examination of head and neck region no palpable lymph nodes were detected. Oral and nasal cavity examination also did not reveal any pathology. On endoscopic laryngeal assessment a polypoidal mass was seen arising from posterior half of anterior third of left true vocal fold. The vocal fold mobility was found normal.We completely excised the tumor by microlaryngeal surgery. The histopathological and immunohistochemical examination of the excised tissue identified the tumor being a pleomorphic undifferentiated sarcoma which was positive for Vimentin, EMA and negative for CK, p63. Patient did not receive radiotherapy/ chemotherepy in postoperative period. Patient has been under follow-up for past 6 months and is disease free as of now.

Discussion

Mesenchymal malignancies of larynx are rare entities. Pleomorphic undifferentiated sarcoma also known as malignanat fibrous histiocytoma is one of such malignancy. The treatment consists of complete excision of the lesion. The need of post-operative radiotherapy and/ chemotherapy depends on the extent of disease.

Keywords

Histiocytoma, Malignant Fibrous; Sarcoma, Pleomorphic Undifferentiated; Vocal Cords

Mesenchymal malignant tumors involving larynx are not so common. Pleomorphic undifferentiated sarcoma also known as Malignant fibrous histiocytoma (MFH) is one such mesenchymal malignancy, which commonly involves upper and lower extremities and the retroperitoneum.[1]

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Laryngeal involvement is rare and only few cases of vocal fold involvement have been reported in literature.[2,3] Rarely these tumors are also reported to occur in patients who received radiation treatment for squamous cell carcinoma of the larynx.[4] It originates in the interstitial cells that differentiate fibroblasts and histiocytes.[5]

The age group affected most commonly ranges between 50 and 70 years.[6] The first-line treatment option for these sarcomas is surgical resection, with or without postoperative chemo- and/or radiotherapy.[7] The disease has occasional metastasis and frequent recurrences.[8] We present a rare case report of pleomorphic undifferentiated sarcoma also known as malignant fibrous histiocytoma

Fig.1. Preoperative endoscopic picture showing broad based polyp shaped vocal mass seen arising from posterior half of anterior third of left true vocal fold (star)

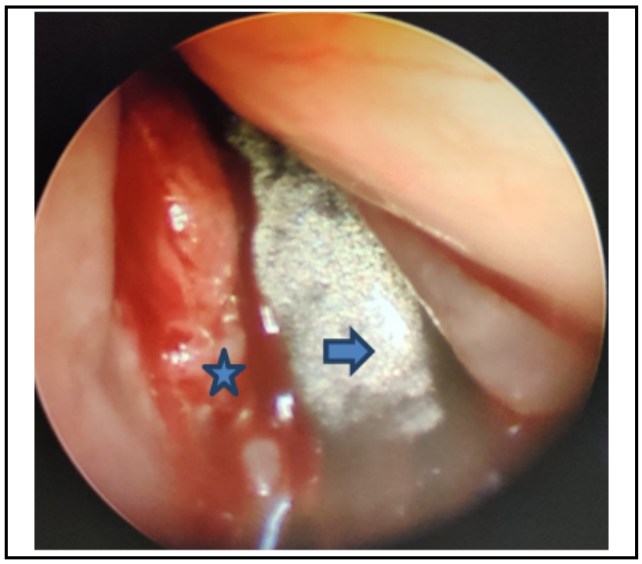

Fig.2. Intraoperative photograph showing the vocal fold after resection of the lesion from left true vocal fold (star), endotracheal tube (arrow)

of true vocal fold in a 65 years old male patient.

Case Report

A 65 years old male patient, presented to ENT OPD with chief complaints of change in voice since past 3 months. Patient denied about complaints of difficulty in breathing, difficulty/ pain while swallowing, trauma to neck and recent neck surgery. Patient has been occasional smoker for past 35 years. On detailed examination of head and neck region, no palpable lymph nodes were detected. Oral and nasal cavity examination also did not reveal any pathology. On endoscopic laryngeal assessment, a polypoidal mass seen arising from posterior half of anterior third of left true vocal fold. The vocal fold mobility was found normal.

The diagnosis was considered as a large vocal cord polyp, considering the size, shape and site of origin. During micro laryngeal surgery for excision of the lesion, we felt the lesion as firm to hard in consistency and not soft as usually seen in vocal polyp. It was broad based and found firmly attached to the vocal fold (Fig.1). Thus, considering the suspicion of malignancy, the lesion was resected completely along with part of vocal fold under microscopic vision (Fig.2), keeping an adequate safety margin of approximately 2-3mm.

The postoperative histopathological and immunohistochemical examination of the excised tissue identified the tumor being a pleomorphic undifferentiated sarcoma (Fig.3) which was positive for Vimentin, EMA and CD68. It was negative for CK, p63, CD34, CD99, S-100 and Desmin. Also, the margin of the resected tissue found negative for disease.

The patient was further evaluated for metastatic spread of disease but found free of it. He did not receive radiotherapy/chemotherapy post operatively. The patient has been under our follow up for past 1 year and is free of residual / recurrent disease (Fig.4).

Discussion

As per WHO update on sarcoma, Malignant fibrous histiocytoma can be categorized as a pleomorphic undifferentiated sarcoma after ruling out other forms of differentiation.[9] Malignant fibrous histiocytoma (MHF) is an older term but still widely used for these tumors. It is an aggressive tumor and treatment options include surgical resection, with or without postoperative chemo-

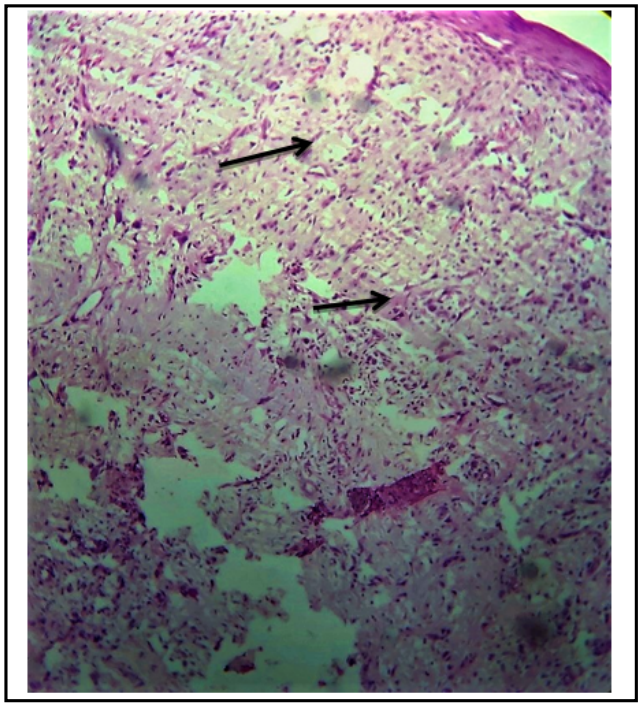

Fig. 3. Histopatologic picture of the lesion showing characteristic tangled (storiform) arrangement of the fibroblasts like spindle cells seen in malignant fibrous histiocytoma (H&E, 10X)

and/or radiotherapy.[7] The recurrence rates are reported as high as 44%, and rates of metastasis to the lungs and the lymph nodes are 82 and 32%, respectively.[10,11] The treatment plan and outcome depends to a great extent on the size, depth of involvement, and the inflammatory component of the tumor.[10,11] On microscopic examination the tumor may appear as a vocal polyp or papilloma. Thus, diagnosis is usually made by histopathologic and immunohistochemical examination of the surgically resected tissue. Imaging studies also play a limited role in smaller tumors.

Complete surgical resection is the first line treatment. The surgeon should aim at achieving an adequate surgical margin without sacrificing important structures during excision, in order to avoid the risk of recurrence. Macroscopic/ microscopic observation during surgery should not be relied upon completely to decide extent of the resection. Ideally, histopathology should confirm margins to be safe. In some reported cases of Malignant fibrous histiocytoma of the larynx, the patients

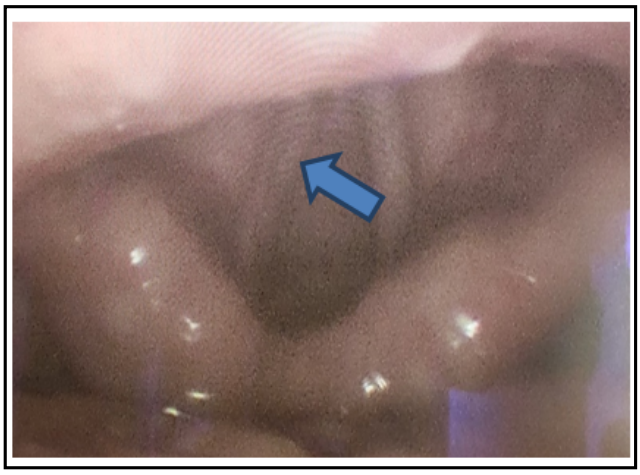

Fig. 4. Post-operative laryngeal endoscopy image well Healed normal left true vocal fold (arrow)

underwent total laryngectomy.[12] In cases of incomplete resection, post-operative radiotherapy / chemotherapy should be considered.[11,13] Local radiotherapy and adjuvant chemotherapy can significantly increase survival rates and reduce the risk of metastasis in these mesenchymal tumors. The treatment outcomes also have varied depending on the tumor's specific location.[1]

In our case where the tumor size was small (HPE specimen measured 0.7x0.5x0.5 mm) and surgical margins were free of tumor, the risk of recurrence is minimized.

By this case study, we aim to stress the fact that a benign looking polyp like lesion which is firm in consistency, having a broad based attachment, in elderly age group, might indeed harbor a rare mesenchymal malignancy. Such lesions should be dealt more radically (complete surgical resection, taking adequate surgical margins) rather than a ligament sparing approach of true benign lesions, considering the higher rate of recurrence and much higher potential for distant metastasis. The need for post-operative radiotherapy and/or chemotherapy should be considered for selected cases after carefully examining the histopathology for completeness of resection.

References

1. Weiss SW, Enzinger FM: Malignant fibrous histiocytoma: An

analysis of 200 cases. Cancer 1978; 41:2250-66

2. Masuda K, Takimoto T, Yashizaki T, et al. Malignant fibrous histiocytoma arising from the vocal cord. ORL J Otorhinolaryngol Relat Spec. 1989; 51(6):365-8
3. Khmel'nitskaia NM, Stepanova IuE, Iurkov IuA. Malignant histiocytoma of the larynx [in Russian]. Vestn Otorinolaringol. 2002; (5):46-8
4. Guney E, Yigitbasi OG, Balkanli S, Canoz OM: Postirradiation malignant fibrous histiocytoma of the larynx: a case report. Am J Otolaryngol. 2002; 23(5):293-6
5. O'Brien JE, Stout AP. Malignant fibrous xanthomas. Cancer 1964;17:1445-55
6. Pathrose G, John NT, Manojkumar R. A rare case of malignant fibrous histiocytoma/pleomorphic undifferentiated sarcoma of the kidney. J Clin Diagn Res. 2015; 9(1):PD27-9
7. Patel SG, Shaha AR, Shah JP. Soft tissue sarcomas of the head and neck: An update. Am J Otolaryngol. 2001; 22(1):2-18
8. Sabesan T, Xuexi W, Yongfa Q, et al. Malignant fibrous histiocytoma: Outcome of tumours in the head and neck compared with those in the trunk and extremities. Br J Oral Maxillofac Surg. 2006; 44(3):209-12
9. Fletcher CD. The evolving classification of soft tissue tumours: An update based on the new WHO classification. Histopathology 2006; 48(1):3-12
10. Weiss SW, Enzinger FM. Myxoid variant of malignant fibrous histiocytoma. Cancer 1977; 39(4):1672-85
11. Zhang GB, Li J, Zhang PF, et al. Radiation-induced malignant fibrous histiocytoma of the occipital: A case report. World J Surg Oncol. 2014;12:98
12. Soh KB, Westmore GA, Moir AA, Colloby PS. Malignant fibrous histiocytomas of the larynx- Report of two cases. Ann Acad Med Singapore 1996; 25(6):878-81
13. Lewis JJ, Brennan MF. Soft tissue sarcomas. Curr Probl Surg. 1996; 33(10):817-72.