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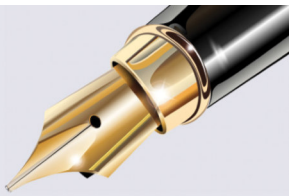

The medical landscape stands on the brink of a profound transformation powered by artificial intelligence (AI). What began as an academic aspiration in computational systems has matured into tangible clinical tools reshaping diagnostics, therapeutics, decision support, and medical education. As voices from across healthcare herald AI's potential to enhance precision, speed, and accessibility, the field of Otorhinolaryngology (ENT) emerges as both a beneficiary and a proving ground for these technologies.

AI's integration into medicine is not merely a technological trend but a structural shift in how clinicians interpret data and deliver care. Across specialties, AI's strength lies in ingesting vast and complex datasets — whether in imaging, physiological signals, or electronic health records — and distilling patterns that might elude even expert clinicians. This breadth of capability is reshaping diagnostics, prognostics, and patient management workflows globally.

In general medical practice, AI algorithms have been developed to interpret imaging modalities such as X-rays, CT, and MRI with performance that often meets or surpasses human experts. These systems can flag abnormalities, prioritize urgent findings, and assist clinicians in early disease detection. Beyond imaging, AI-powered tools are increasingly employed for remote patient monitoring, chronic disease tracking, and early detection of clinical deterioration by synthesizing physiological data streams in real time. Such capabilities are especially valuable in resource-limited settings and for augmenting clinical capacity without sacrificing quality of care.

In Otolaryngology, the story is equally compelling. A comprehensive bibliometric analysis of AI research in ORL reported 498 published articles (1982–2024), reflecting a rapid escalation in interest and exploration of AI applications in ENT practice. Diagnostics and imaging — particularly MRI and CT radiomics — are among the most advanced areas of implementation, where deep learning models assist in tumor detection, segmentation, and characterization. AI models have been successfully applied to complex tasks such as predicting lymph node involvement, assessing bone invasion, or differentiating benign from malignant lesions, significantly enhancing diagnostic accuracy and clinical decision support.

In image-based diagnosis across ENT subdomains, state-of-the-art reviews show impressive aggregated performance. Machine learning systems analyzing endoscopic or radiographic input have achieved accuracy ~88%, area under the ROC curve ~92%, sensitivity ~87%, and specificity ~89%, underscoring robust diagnostic potential.

Other applications include voice and sound analysis for laryngeal pathology, histopathological interpretation, and even AI-augmented cochlear implant tuning. As one narrative review in otolaryngology reports, subsets of AI — specifically deep learning — have demonstrated model performances comparable to specialists in detecting conditions such as nasopharyngeal carcinoma (~92% accuracy) and laryngeal malignancies (~86% accuracy), while also enabling segmentation and intraoperative landmark recognition.

AI's value extends beyond diagnosis to surgical skill evaluation and education. Traditional surgical training often relies on subjective assessment, which can vary widely among evaluators. AI tools using motion tracking, kinematic data, and video analysis can provide objective feedback on surgical technique, with classification accuracies ranging from approximately 60–100% depending on the task and modality. Such metrics hold promise for standardized benchmarking, accelerated learning curves, and enhanced trainee feedback loops.

Additionally, generative AI — including large language models — is being explored for crafting educational materials, supporting board exam preparation, and enhancing patient communication. Comparative analysis of advanced AI models (e.g., GPT-4) suggests superior performance over earlier tools in answering specialty-specific knowledge questions, highlighting their growing utility in medical education.

Despite compelling technological strides, clinician acceptance and integration remain active topics of research. A mixed-methods study among otolaryngologists found that while familiarity with general AI concepts is common (72% reported some familiarity), only a minority had practical clinical experience with AI tools. Still, a strong majority see clinical utility in AI assistance, with 82% willing to use AI for decision support and 78% comfortable with AI contributing treatment recommendations. Many expect AI integration into practice within the next five years, albeit with caution toward trusting AI for complex tasks like malignancy detection.

These perspectives highlight a critical transitional phase: clinicians recognize AI's promise but demand robust validation, transparency, and evidence of improved outcomes before widespread adoption.

AI's potential is shadowed by real challenges. Model accuracy, especially in diverse clinical populations, can vary widely depending on training data quality, representativeness, and size. Some analyses report AI accuracies in ORL research datasets ranging from 70% to 98%, contingent upon case volume and study design, often limited by small sample sizes and lack of standardized protocols.

Moreover, issues of algorithmic bias, data privacy, and legal liability loom large. Who bears responsibility when an AI's recommendation contributes to an adverse outcome? What safeguards ensure patient data confidentiality in AI training pipelines? And how should regulators balance innovation with clinical safety?

Importantly, AI systems may generate confident but erroneous outputs — sometimes termed "hallucinations" — if trained or deployed without rigorous validation. This necessitates a careful

human-in-the-loop approach where clinicians retain ultimate decision-making authority and critical reasoning.

Looking forward, the trajectory of AI in medicine and ENT suggests a layered evolution from research and proof-of-concept work to integrated clinical tools that augment — not replace — human expertise. Several domains are poised for particularly rapid growth:

Radiomics and Precision Diagnostics — AI-enhanced imaging that provides quantitative biomarkers, subgroup risk stratification, and personalized prognostic modeling.

Operative Assistance — real-time intraoperative guidance, instrument tracking, and augmented visualization to support surgical decision-making.

Patient Engagement and Education — AI chatbots and language models that tailor explanations, follow-up instructions, and self-care guidance to individual patient needs.

Outcomes Prediction and Workflow Optimization — predictive algorithms for postoperative complications, treatment success, and resource allocation.

To usher this future responsibly, multidisciplinary collaborations among clinicians, data scientists, ethicists, and regulators are essential. Data standards, prospective multicenter validation studies, explainable AI frameworks, and clinician education programs will be key pillars in achieving impactful, equitable, and safe AI integration.

AI's advent in medical science represents more than a technological novelty. It is a structural evolution in how we approach disease detection, clinical decision-making, education, and patient engagement. In Otolaryngology, AI's footprint — from imaging and diagnosis to surgical training and prognostics — is expanding rapidly, with research outputs nearly doubling in recent years and early evidence of high diagnostic performance in multiple subspecialties.

Yet, embracing this revolution demands thoughtful stewardship. AI must be developed and deployed with rigorous validation, clinician oversight, ethical safeguards, and a commitment to enhancing — not undermining — the human dimensions of care. In doing so, we can harness AI's transformative capabilities while ensuring that it serves as a trusted ally in improving patient outcomes and elevating the art and science of medicine.

Dr. Saumitra Kumar
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Main Article

Hearing Assessment and Noise-related Attitudes among Traffic Policemen of Puducherry

https://doi.org/10.47210/bjohns.2025.v33i3.201

Safia Zuhra Akbar Ali,[1] Geetha Kishan Siddapur,[1] Venkataramanan Ramakrishnan,[1] Ganesh Singaravelu,[1] Merwin Paul Remson,[1] Abilash Pullanikat Mohandas[1]

ABSTRACT

Introduction

To determine the hearing loss and evaluate the noise-related attitudes among Traffic policemen of Puducherry.

Materials and Methods

A community-based cross-sectional observational study was carried out involving 76 traffic policemen aged 20 to 60 years, employed in and around Puducherry via convenience sampling , aimed at assessing attitudes related to noise and determine hearing loss through the Otoacoustic Emission test (OAE). Those individuals who exhibited OAE refer results were then further evaluated using a Pure Tone Audiometry.

Results

Out of 76 study participants, 69% were OAE pass and 31% were OAE refer. Out of 31% OAE refer, the prevalence of hearing impairment was 58.30% for mild, 29.10% for moderate and 12.60% for severe sensorineural hearing loss. Based on environmental measurements, 73.7% of participants were working in areas with daily noise exposure level of 85-90 decibels. Only 40% of study participants were aware of hearing protection measures, however majority expressed concern about the potential impact of noise on their health.

Conclusion

This study revealed that traffic policemen are at constant risk of noise-induced hearing loss (NIHL). Therefore, regular periodic hearing assessment needs to be done.

Keywords

Noise Induced Hearing Loss; Prevalence; Pure Tone Audiometry

Traffic policemen are at a heightened risk of exposure to noise pollution as part of their occupational hazard.[1] The streets of Puducherry are often characterized by high levels of noise from vehicular traffic and horns. This persistent exposure to noise can affect the hearing of traffic policemen. Moreover, their attitudes and perceptions regarding noise pollution can influence their overall well-being and job performance. Individual predisposition to noise-induced hearing loss varies.[9] The challenges faced by these individuals and understanding their perspectives on noise pollution is not much explored yet. The objective of my study was to determine the prevalence of hearing loss and evaluate the noise-related attitudes among traffic policemen of Puducherry.

Materials and Methods

This cross-sectional observational study was conducted

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in the Department of Otorhinolaryngology & Head and Neck Surgery between July 2023 to September 2023.

An Awareness programme was conducted for traffic policemen, in that programme, we recruited 76 traffic policemen aged 20-60 years working in and around Puducherry via convenience sampling. Institutional ethics committee approval was taken before commencing the study (NO.IEC/C-P/13/2023).

Fig. 1. Shows the methodology of the study

Descriptive statistics were used to summarize the demographic characteristics of the participants. Audiometric data were analysed to determine the prevalence of hearing impairment. The questionnaire responses were analysed to understand noise-related attitudes and awareness among traffic policemen. OAE screening was used as a first-line screening tool due to its portability, rapid testing capability and it does not require sound-proof room. Pure tone audiometry was reserved for those failed OAE to confirm and quantify the hearing loss. No psychological assessments were included in this study. Average daily noise exposure levels were objectively measured at the traffic junctions using a calibrated digital sound level meter. Measurements were recorded at peak traffic hours over a duration of 30 minutes per session on two separate weekdays to account for day-to-day variations at participant's work sites.

Following is a structured questionnaire which was used to assess the hearing and noise-related attitudes among Traffic policemen:

Questionnaire for hearing assessment & noise related attitudes among traffic policemen :

Name :

Age :

Gender :

Education :

Place of work:

Work experience in years :

Daily working hours :

Self Assessment of Hearing Status

CHARACTERISTICS	EXCELLENT	AVERAGE	POOR
QUALITY OF HEARING			
HEARING OVER PHONE			
HEARING IN CROWD			
QUALITY OF SLEEP			

Noise Related Attitude

	YES	NO
Do you feel uncomfortable to loud sounds?		
Do you experience disturbance in daily routine activities after work?		
Do you know that exposure to loud noise can lead to noise induced hearing loss?		

	YES	NO
Ever used ear plugs?		
Usage of other PPE?		
Do you ignore ear plug usage because of cosmetic stigma?		
Is using ear plug regularly difficult?		
Are ear plugs costly?		

Results

The mean age of the 76 study participants was 32.5 +/- 13.6 years.

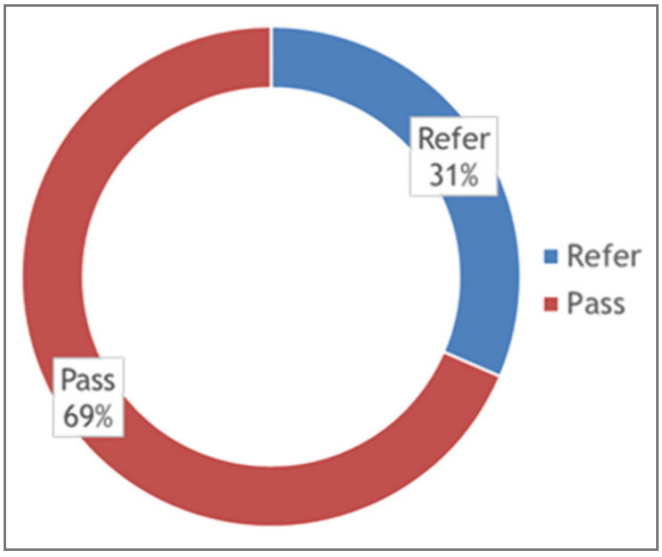

Fig. 2. OAE results of the study participants

Figure 2 shows that 69% were OAE pass and 31% were OAE refer.

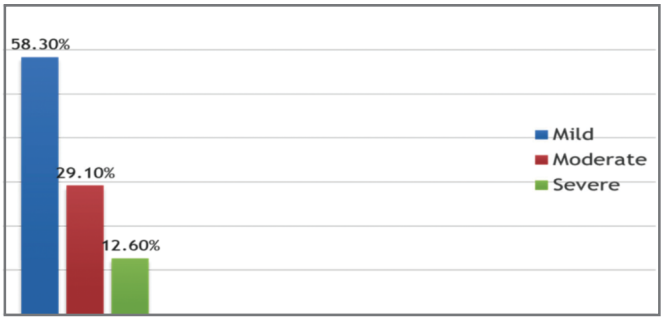

Fig. 3. Prevalence of Hearing Impairment in study participants

Figure 3 shows that out of 76 participants, 24 (31.6%) exhibited some degree of hearing impairment, as defined by the World Health Organization (WHO) criteria. The majority of cases were classified as mild (n = 14), followed by moderate (n = 7) and severe (n = 3) hearing impairment.

Based on the sound level meter results, the average daily exposure to noise in their work was assessed.

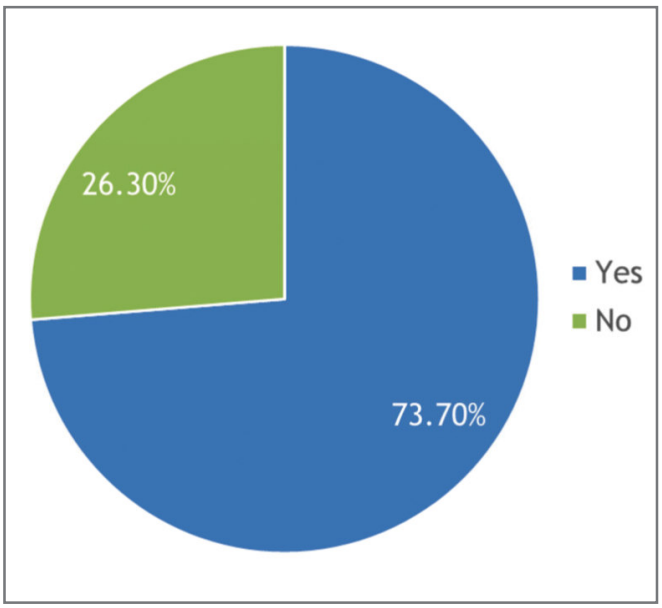

Fig. 4. Noise exposure levels of 85-90 decibels in study participants

Figure 4 shows that majority (n=56, 73.7%) reported daily noise exposure exceeding recommended limits, with an average noise level of 85-90 decibels. This exposure level was recorded using objective field measurements.

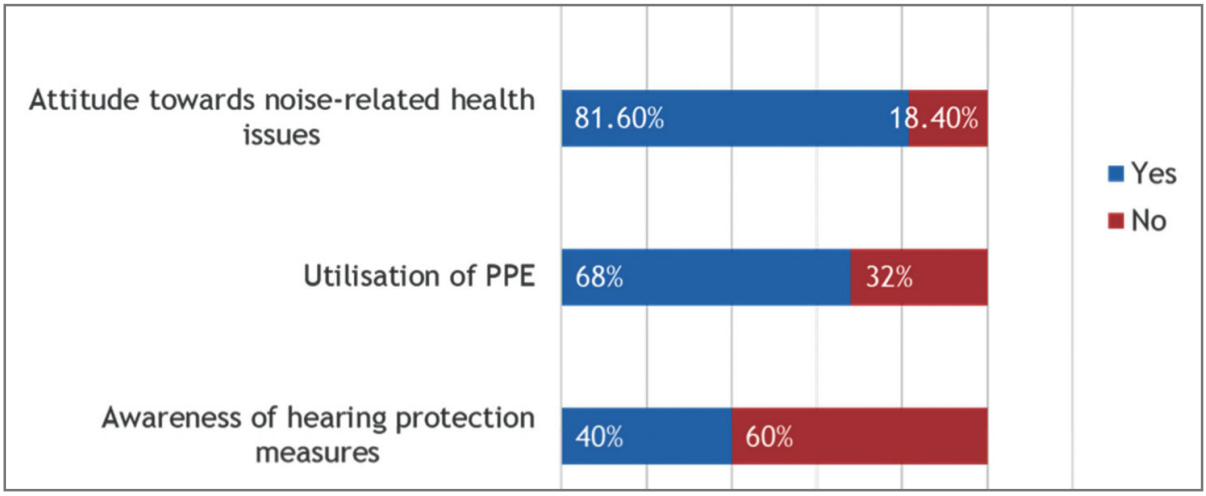

Fig. 5. Attitudes and Awareness of Noise-related health issues in study participants

The findings of attitudes and awareness regarding noise-related health issues are as follows (Figure 5) :

- Awareness of Hearing Protection measures: Only 40% participants were aware of hearing-specific protective measures, such as earplugs.
- Utilization of Personal Protective Equipment (PPE): 68% of participants reported using PPE in general which include non-auditory protective measures like high-visibility vests, gloves and masks, only a small subset of these reported using hearing-specific PPE, indicating a gap in awareness and targeted protection against occupational noise exposure.
- Attitudes towards Noise-Related Health issues: A majority of participants (n = 62, 81.6%) expressed concern about the potential impact of noise on their hearing health. However, a significant number (n = 14, 18.4%) did not consider noise related health risks a significant concern.

Depending upon the results, the participants were counselled regarding usage of hearing-specific PPE's, noise-related health issues and for further management, including hearing aid trial and fitting.

Discussion

A substantial proportion of traffic policemen (31.6%) exhibited some degree of hearing impairment, which is a cause for concern. Daily noise exposure levels exceeded recommended limits for majority of participants, indicating the high-risk nature of their work environment. Awareness of effective hearing protection measures was relatively low, and not all participants consistently used PPE.[1]

A study in China concluded that high frequency hearing loss was high in population exposed to occupational noise.[2] Noise-induced hearing loss still remains troublesome, despite public health awareness campaigns are conducted in developed countries.[3] WHO Environmental noise guidelines 2018 for the European region formulated specific recommendations (day and night time) for exposure of road traffic, railway noise, aircraft noise, wind turbine and leisure noise.[4]

Existing literature exhibits non-auditory effects like cardiovascular disorders, mental health effects, endocrine irregularities apart from auditory effects like hearing loss and tinnitus.[5] More than 25% of study population had auditory and non-auditory health effects of noise exposure. There has been evidence that smoking predisposes to noise-induced hearing

loss.[11] Miao L (2023) found that NIHL and hypertension was noticed in males aged >35 years and with duration of noise exposure >5 years.[12] Noise-induced hearing loss stays as a global burden and early detection of such hearing loss by periodic audiometric tests helps in early intervention.[6]

A Ghimire and SR Niraula (2015) found out that association exists between the duration of exposure and level of noise exposure. They also highlighted the fact that providing PPEs is not sufficient, periodic screening should be done to influence traffic policemen for regular usage.[7]

A study done by Sanju HK and Kumar P (2016) on traffic policemen and bus drivers showed that study participants had good quality of hearing but lack of awareness of noise-induced hearing loss and PPEs usage.[8]

A study conducted in Bangladesh highlights that tinnitus and hearing loss are reported among traffic policemen. Auditory morbidity is an alarming matter which should not be abandoned.[10]

Conclusion

This study revealed that traffic policemen are at constant risk of noise-induced hearing loss. Therefore, regular periodic screening for hearing assessment using the OAE test, may be implemented as part of the National Health Programme. Early detection and timely intervention by providing hearing-specific PPE needs to be done to prevent noise-induced hearing loss. A significant knowledge-practice gap was identified between general PPE usage and awareness of specific hearing protection measures, which calls for focused training interventions.

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Main Article

Influence of Intercanthal Distance Variation in Locating Lacrimal Sac During Endonasal Dacryocystorhinostomy

https://doi.org/10.47210/bjohns.2025.v33i3.259

Ravishankar C,[1] Soumya Vedavyasa[2]

ABSTRACT

Introduction

Endoscopic endonasal dacryocystorhinostomy is one of the leading modalities for the treatment of distal lacrimal system obstruction. Knowledge of an accurate position of lacrimal sac in the lateral nasal wall is crucial to perform this surgery and to obtain favorable long-term results. This study is an attempt to define the position of lacrimal sac in the lateral nasal wall in relation to axilla of middle turbinate which is a well-accepted anatomical landmark on the lateral nasal wall to perform endonasal dacryocystorhinostomy; in extension, a variation in the inner intercanthal distance of the subject was correlated with any variation in the distance between the axilla of middle turbinate and lacrimal sac.

Materials and Methods

An observational cross-sectional study was conducted on thirty patients with epiphora. Patients were evaluated with lacrimal syringing and those with distal lacrimal system obstruction were included in the study. Inner intercanthal distance was measured using vernier caliper. All patients underwent endoscopic endonasal dacryocystorhinostomy and intraoperative measurement between the axilla of middle turbinate and midpoint of lacrimal sac in the anteroposterior dimension was recorded.

Results

Females predominantly presented with epiphora. The average anteroposterior distance of lacrimal sac from the axilla of middle turbinate in the lateral nasal wall was found to be 7.06mm with a range of 6mm to 8mm. Intercanthal distance in our study population had a range of 26mm to 38mm with a mean of 31.46mm. Statistically significant correlation could not be established between the inner intercanthal distance and position of lacrimal sac in relation to the axilla of middle turbinate.

Conclusion

The lacrimal sac can be located 6mm to 8mm anterior to the axilla of middle turbinate. However, it does not correlate with varying inner intercanthal distance. The knowledge of accurate position of lacrimal sac in the lateral nasal wall is important to perform an endoscopic endonasal dacryocystorhinostomy and to obtain good long-term results.

Keywords

Epiphora; Endoscopic Endonasal Dacryocystorhinostomy; Lacrimal Sac; Axilla of Middle Turbinate; Intercanthal Distance

Epiphora is a clinical presentation with overflow of tears. Inadequacy of the lacrimal drainage system is one of the common and important causes of epiphora, which can be functional or anatomical. Anatomical obstruction can occur at various levels of lacrimal drainage system from punctum to Hasner's valve. Failure of proximal pumping mechanism or a critical narrowing in the lacrimal drainage system that slows normal lacrimal flow can cause functional obstruction. The incidence of nasolacrimal duct obstruction is estimated to be approximately 10% at 40 years of age increasing to 35-40% at 90 years of age.[1]

Endoscopic endonasal dacryocystorhinostomy is one of the leading modalities for management of distal lacrimal

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system obstruction which can be at the level of lacrimal sac or distal to it. It is a surgical procedure in which lacrimal flow is diverted into the nasal cavity through an artificial opening made at the level of lacrimal sac. The critical element for success of this procedure is creation of widest possible marsupialization of the medial wall of the lacrimal sac.[2]

Failure to complete endoscopic endonasal dacryocystorhinostomy can be attributed to inability to accurately locate the lacrimal sac during the endonasal approach.[3] This can be overcome by properly mapping the lacrimal sac position in relation to a known anatomical landmark such as axilla of middle turbinate, which is the most anterior part of insertion of the middle turbinate to the lateral nasal wall.

Better knowledge of position of lacrimal sac and its variations in lateral nasal wall helps to achieve complete exposure of lacrimal sac during endonasal dacryocystorhinostomy[4] and also avoidance of complications such as fracture nasal bones, intranasal and orbital hemorrhage[5], orbital fat prolapse, damage to extraocular muscles (medial rectus, inferior rectus) and orbital cellulitis.

Many surgeons have contributed to the understanding of the anatomy of lacrimal sac in the lateral nasal wall and our understanding is still evolving. It is our observation that there is continuing difficulty in locating the lacrimal sac in some cases even in the light of current knowledge. An attempt is made in this study, to define variations in the position of lacrimal sac in the lateral nasal wall with respect to anatomical variations external to the nasal cavity. Woo et al[6] observed and established that a thick frontal process of maxilla can be anticipated in presence of a low nasal bridge in Asian population. However, the positional variation of lacrimal sac with respect to changes in intercanthal distance is not defined in the literature available till date.

The objective of our study is to find a correlation between inner intercanthal distance and the position of lacrimal sac in relation to the axilla of middle turbinate, which may help map the accurate position of lacrimal sac.

Materials and Methods

After obtaining approval and clearance from the institutional ethical committee, 30 patients from outpatient and inpatient departments of otorhinolaryngology, fulfilling the inclusion criteria were enrolled for the study. Informed consent was taken for all patients for enrollment into the study. Demographic information and a detailed history were taken with regards to the symptoms of chronic dacryocystitis like excessive watering of eyes, tearing, swelling at the inner canthi of the eye, discharge of pus or mucus through the punctum on application of pressure over the inner canthi. Local examination of eye, local examination of nose including anterior rhinoscopy and endoscopic examination followed by complete otolaryngologic examination including neck. Inner Intercanthal distance was measured using vernier caliper. Inclusion criteria were age above 18years, patients with chronic dacryocystitis presenting with epiphora with regurgitation from opposite punctum on lacrimal syringing i.e. with no canalicular block and patients willing to give informed consent and fit to undergo surgery. Exclusion criteria were patients not willing to give informed consent and not fit to undergo surgery, pregnant and lactating women, patient with epiphora with regurgitation from same punctum on lacrimal syringing i.e. with canalicular block, patients with punctal abnormalities like ectropion or entropion, patients with acute dacryocystitis or lacrimal abscess**,** patients with a large swelling, scar, fistula or deformity around root of nose, malignancy involving lacrimal drainage system, previous history of surgery of lacrimal drainage system, previous nasal surgery on the affected side, patients with history of trauma to face, facial bone fractures.

Intercanthal distance was measured using vernier's calipers. [figure 1] Endonasal dacryocystorhinostomy was performed under local anesthesia / general anesthesia with informed written consent. Nasal cavity was anaesthetized and decongested with 4% lignocaine and adrenaline, ten minutes prior to the procedure. Patient was positioned supine with 30-degree head end elevation. Local infiltration was given to the lateral nasal wall with 2% lignocaine and 1:1,00,000 adrenaline using 26G needle.

Axilla of middle turbinate was identified on endoscopy. In cases where there was a deviated septum restricting the surgical field, a concurrent septoplasty was performed. Incision for dacryocystorhinostomy was placed anterior to middle turbinate starting around 8mm above the axilla of middle turbinate, down to the level just above the insertion of inferior turbinate. Rectangular flap was made with the above defined limits. Mucoperiosteal flap was elevated using Freer's elevator to expose the anterior lacrimal bone and posterior frontal process of maxilla, which were removed with Kerrison's punch or a microdrill to allow maximum exposure of lacrimal sac, to the extent it stood proud on the lateral nasal wall. At this point, before incising the well exposed lacrimal sac, the anteroposterior distance between the axilla of middle turbinate and midpoint of the medial wall of the lacrimal sac was measured and documented [figure 2]. This measurement was done using the straight end of a Freer's elevator which was calibrated in millimeters, which was specially designed for this study. It contained markings in millimeters up to 20mm [figure 3]. Surgery was completed with adequate marsupialization of the sac.

Statistical analysis was performed to correlate the variation of the inner intercanthal distance measurements with the variations in the distance of axilla of middle turbinate and the lacrimal sac measured.

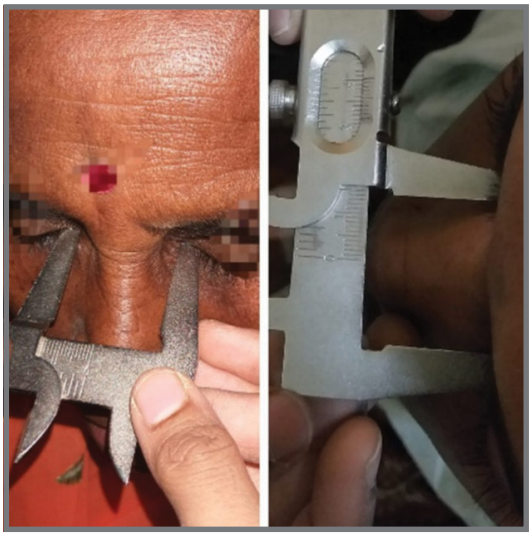

Fig. 1. Measurement of intercanthal distance using Vernier's calipers.

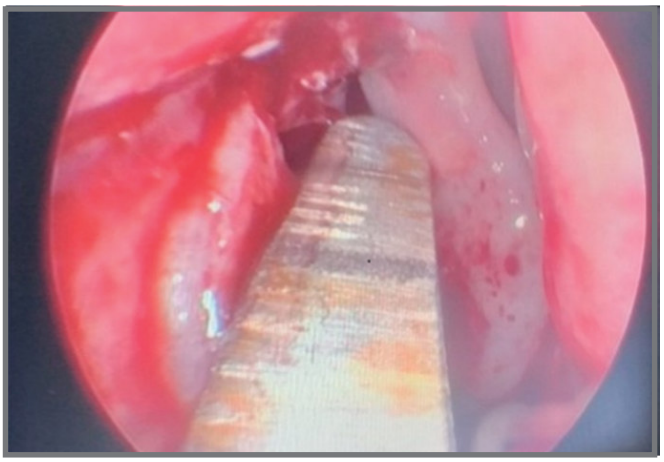

Fig. 2. Intraoperative measurement of distance between axilla of middle turbinate and lacrimal sac.

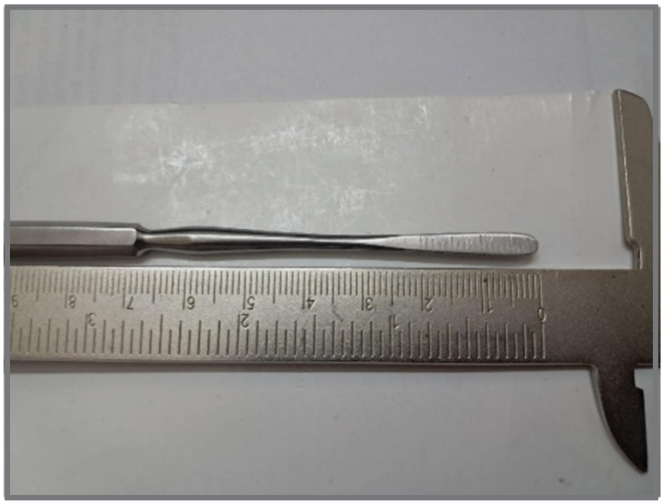

Fig. 3. Calibrations on flat end of Freer's elevator used to measure distance between axilla of middle turbinate and lacrimal sac.

Results

Presentation of epiphora was commonly found in 4th decade and a range of 24 years to 71 years were evaluated in our study. The mean age of presentation was 41 years with standard deviation of 13 years. Out of 30 participants in the study, 19 patients (63%) were females and 11 patients (37%) were males, indicating female predominance in the presentation of epiphora. Ten

percent i.e., three of our patients presented with bilateral epiphora, about 43% of our patients presented with left sided epiphora and 47% of our patients presented with right sided epiphora. Most of our patients presented with watery discharge from eye, but 7 of our patients had mucoid discharge from the eye and resultant associated blurred vision. Four of our patients also had associated nasal obstruction on the affected side and four patients had associated headache. On diagnostic nasal endoscopy, four patients had a deviated septum on the affected side restricting the handling of surgical field who underwent concurrent septoplasty; one patient had a hypertrophied turbinate on the affected side. Another patient had nasal polyp in the middle meatus on the affected side on diagnostic nasal endoscopy, which was managed medically before proceeding to dacryocystorhinostomy and endoscopic sinus surgery.

Intercanthal distance measured in our study was of the range 26mm to 38mm with a mean of 31.46mm and a standard deviation of 3.14. Females had an intercanthal distance of 26mm to 34mm whereas males had a range of 31mm to 38mm. The average intercanthal distance in males and females were 34.09 and 29.94 respectively in our study.

Table I: Distribution of inner intercanthal distance

SEX	RANGE (mm)	MEAN ± SD (mm)
Male (11)	31-38	34.09 ± 2.42
Female (19)	26-34	29.94 ± 2.43
Total (30)	26-38	31.46 ± 3.14

The anteroposterior distance from axilla of middle turbinate (MT) to the lacrimal sac, measured intraoperatively was found to be in the range of 6mm to 8mm in our study with mean measurement of 7.06 mm.

Table II: Distance between axilla of MT and midpoint of sac

SEX	RANGE (MM)	MEAN ± SD (MM)
MALE (11)	6 – 8	7.06 ± 0.784
FEMALE (19)	6 – 8	7.07 ± 0.78
TOTAL (30)	6 – 8	7.06 ± 0.784

A scatter diagram was plotted (Figure 4) with the inner intercanthal distance on abscissa and the distance of the lacrimal sac from the axilla of middle turbinate on ordinate. Chi square test was used for statistical analysis. P value was found greater than 0.05, interpreted to be not significant statistically.

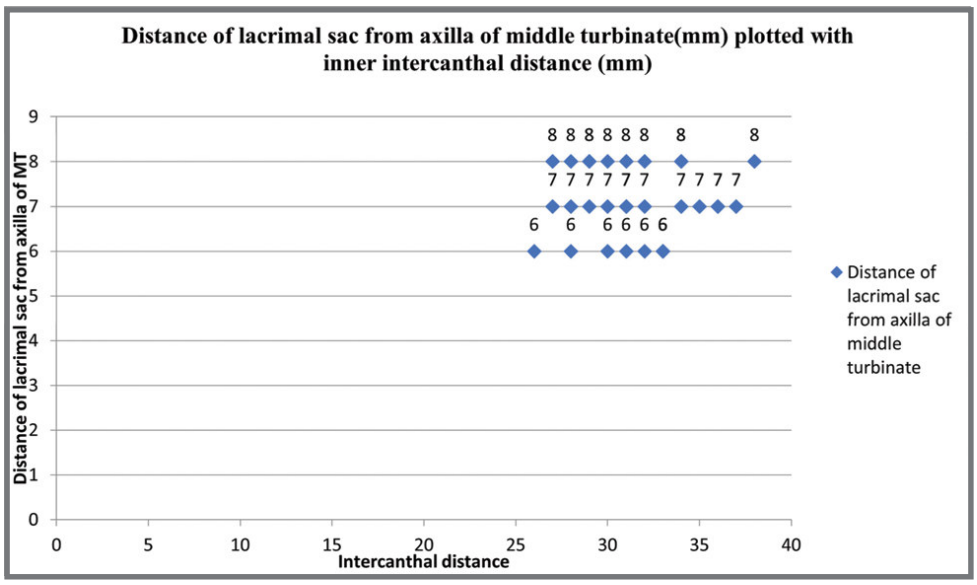

Fig. 4. Scatter diagram representing correlation between distance of midpoint of lacrimal

Discussion

Success of an endoscopic endonasal dacryocystorhinostomy can be attributed to factors such as good visualization of the lacrimal sac, knowledge of anatomical landmarks known to help locating the lacrimal sac endonasally and ability to remove the bone overlying the lacrimal sac to completely expose the sac for marsupialization.[7] Despite advancements in technology and continuing research contributing to the knowledge on anatomical localization of lacrimal sac in the lateral nasal wall, difficulties are still encountered in accurately locating the sac with consequent failure to complete the procedure.

Axilla of middle turbinate is the most anterior and superior insertion of middle turbinate to frontal process of maxilla on the lateral nasal wall and is synonymous to operculum of middle turbinate, anterosuperior attachment of middle turbinate mentioned in various literature. Other intranasal landmarks used to describe the position of lacrimal sac include maxillary line and uncinate process. Maxillary line is a curvilinear eminence or protuberance in the lateral nasal wall extending from the axilla of middle turbinate to the root of inferior turbinate; lacrimal sac is located lateral to the maxillary line.[8] Uncinate process is a thin sickle shaped bone oriented in para-sagittal plane; it attaches to frontal process of maxilla and lacrimal bone anteriorly. The lacrimal sac fossa lies anterior to uncinate process and posterior to the maxillary line. Uncinate process limits the posterior extent of dissection in endonasal DCR and has to be preserved.[9] A collective knowledge of these anatomical structures in the lateral nasal wall and their variations is required for a surgeon to perform endonasal DCR. An additional knowledge of sac position variations with respect to extranasal measurements may help us anticipate different positions of the sac.

Most of the patients in our study were in fourth decade and the mean age of presentation was 41years with standard deviation of 13. The youngest patient was in our study was 24years and the oldest patient was 71years. Nearly two thirds of our study population (19patients) were females and only one third (11patients) were males. The distribution of age in our study is similar to the study by Onerci M et al[10] which has a mean age of presentation as 42years with a standard deviation of 15; the study had 78% of female and 22% male patients. This female predominance of nasolacrimal duct obstruction can be explained by the lower nasolacrimal fossa and the narrower nasolacrimal duct observed in females.[11] Majority of the patients in our study were home makers. There is no predilection in laterality observable in our study.

The inner intercanthal distance measured in our study was of the range 26 mm to 38 mm with a mean of 31.46 mm and standard deviation of 3.14 mm. Females had an intercanthal distance of 26 mm to 34 mm whereas males had a range of 31mm to 38mm. The average inner intercanthal distance in males and females were 34.09 mm and 29.94 mm respectively in our study. Facial anthropometric assessment of inner intercanthal measurement by Agarwal J[12] et al gives the mean inner intercanthal distance to be 32.50 mm in adults above 25 years of age with a range of 30.85 mm to 37.65 mm.

Patients with developmental disabilities, oculofacial trauma, sinonasal tumor presenting before complete development of craniofacial skeletal framework, craniofacial congenital anomalies like cleft lip and palate, history of certain neurological diseases exhibit an abnormally increased inner intercanthal distance, also called telecanthus. The patients in our study did not have history of any such anomalies and none of the patients exhibited an abnormally increased intercanthal distance. The intercanthal distance varies among different racial groups due to potential differences in craniofacial growth patterns. Intercanthal distance increases with increasing age due to growth of cranial bones till the age of 25 years as observed by Agarwal et al.[12] All the patients in our study were above the age of 25 years with completed craniofacial growth. There are no studies in literature which has evaluated a correlation between inner intercanthal distance and position of lacrimal sac in relation to an anatomical landmark in the lateral nasal wall.

The distance between the axilla of middle turbinate and the lacrimal sac was measured intra operatively using

the graduated straight end of Freer's elevator which was specially designed and calibrated for this study. It contained markings in millimeters (mm) up to 15 mm. The anteroposterior distance from axilla of middle turbinate to the midpoint of the exposed lacrimal sac, measured intraoperatively was found to be in the range of 6 mm to 8 mm in our study with mean measurement of 7.06 mm and no significant difference was noted with respect to sex.

Woo KI[6] et al evaluated computed tomography of 152 normal orbits and inferred that the operculum of middle turbinate was attached to lacrimal sac fossa in 93.4% of the subjects with wide positional variation. In a study by Rebeiz E[7] et al, the lacrimal sac was found consistently in relation to the junction of the superioanterior attachment of the middle turbinate with lateral nasal wall intraoperatively and the average width of the lacrimal sac was found to be 1.13 cm. Wormald PJ4[3] et al demonstrated that the mean height of the sac above the middle turbinate was 8.8 mm and below it was 4.1 mm. Orhan M[13] et al demonstrated that the distance between the axilla of middle turbinate and posterior edge of lacrimal sac was 4.06 mm on an average with a range of 0 mm to 9.68 mm; and the distance between the axilla of middle turbinate and anterior edge of lacrimal sac was 3.67 mm on an average with a range of 0 mm to 7.51 mm. In our study, Chi square test was used for statistical evaluation and P value was found greater than 0.05, thus stating the correlation between inner intercanthal distance and the distance between axilla of middle turbinate and lacrimal sac was statistically not significant.

A review on 208 failed DCR[14] revealed that the major reason for failure were errors in the bony osteum size and location. False location of lacrimal sac, sometimes by a protuberance present more anteriorly than usual, leads to more anterior dissection, causing inadequate exposure, was quoted as one of the failures of DCR[10], thus emphasizing the importance of knowledge and ability to identify the sac in relation to constant anatomical landmarks.

Proper selection of patient and a comprehensive knowledge of the lateral nasal wall anatomy with respect to lacrimal sac is an essential prerequisite for a surgeon to perform successful endoscopic endonasal DCR with minimal complications and obtain good long-term results. The lacrimal sac was found to be 6mm to 8mm distant from the axilla of middle turbinate in our study. Results of this study showed no significant correlation between inner intercanthal distance and the position of lacrimal sac from the axilla of middle turbinate.

Conclusion

The anatomical knowledge of the accurate position of lacrimal sac in the lateral nasal wall is very important while performing an endoscopic endonasal DCR and to obtain good long-term results. This study was intended to find out existence of any correlation between inner intercanthal distance and the position of lacrimal sac from the axilla of middle turbinate, which will help us define any change in the location of lacrimal sac in lateral nasal wall when there is an increase or decrease in the inner intercanthal distance. In this study, we did not find a statistical correlation between the inner intercanthal distance and position of lacrimal sac in relation to axilla of middle turbinate.

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Main Article

Ear Nose Throat Manifestations in Head Injury Cases Necessitating Hospitalization

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ABSTRACT

Introduction

Major consequences of head injury arise either from traumatic brain injury or from temporal bone fracture. Critical intracranial injuries often demand early management, thus overlooking ear nose throat manifestations. This study was undertaken to highlight the otorhinolaryngeal manifestations necessitating hospital admission in cases of head injuries.

Materials and Methods

A prospective study was conducted in a tertiary care hospital of Indian Armed Forces to study the otorhinolaryngeal manifestations necessitating hospital admission in 30 patients of head injuries fulfilling the requisite criteria. After a thorough clinical examination, appropriate radio-imaging studies were done for head injury, temporal bone fracture and nasal fracture. Hearing was evaluated by pure tone audiogram. Data was analysed using validated statistical software.

Results

Majority were male in the age group of 30-40 years having sustained head injury in road traffic accidents. 90% patients showed otological manifestations including ear bleed, Battle sign, hemotympanum, perforation of tympanic membrane, hearing loss, tinnitus, vertigo, nystagmus, facial palsy, and CSF otorrhea. 50% cases of otic capsule violating fractures were complicated with facial palsy, sensorineural hearing loss, tinnitus and vertigo. Nasal findings were noted in 56.6% cases which included epistaxis, impaired olfaction, CSF rhinorrhea and maxillofacial fractures. Extradural haemorrhage, subarachnoid haemorrhage and subdural haemorrhage were seen in 23.3% cases. There were no cases with throat manifestations.

Conclusion

A large proportion of cases of head injury necessitate hospitalization for management by a multi-specialty team. Major consequences of such events arise either from brain injury or from temporal bone fracture. Though life-saving neurosurgical intervention is always a priority, timely appropriate attention to otorhinolaryngeal morbidities cannot be overemphasized.

Keywords

Head Injury; Temporal Bone Fracture; Hearing Loss; Facial Palsy; Otic Capsule; Maxillofacial; Anosmia

Head injury has been a cause of concern all over the globe, acquiring the state of a tragic problem irrespective of the nation being developed, developing or underdeveloped. The incidence is even increasing due to vehicular accidents, industrial mishaps, sporting misadventures etc. Traumatic brain injury (TBI) is referred to as 'the silent epidemic' by Dewan et al who stated that TBI contributes to worldwide death and disability more than any other traumatic insult and reported that 69 million (95% CI 64 -74 million) people in the world are estimated to suffer TBI from all causes each year, with the Southeast Asian and Western Pacific regions experiencing the greatest overall burden of disease.[1] According to an Indian study, approximately 75% of road traffic accidents (RTA) result in head injury.[2]

A large proportion of cases of head injury do necessitate hospitalization for management by a multi-specialty team. Major consequences of such events arise either from TBI or from temporal bone fracture (TBF) but may also include maxillofacial and cervical spine injuries. TBF may cause significant morbidity by injuring

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the in-house structures, namely the external auditory canal (EAC), middle ear structures, cochlea, vestibule, cochleovestibular nerve and the facial nerve. Yet, it is not the TBF but the critical intracranial injuries that often dictate their early management, including subarachnoid haemorrhage, subdural haemorrhage, brain contusion, and cerebral oedema.[3] Attention of the medical team to the life-saving priority often results in the ear nose throat (ENT) manifestations being over looked or go unnoticed. Patients later present with delayed manifestations such as external ear canal laceration, hemotympanum, tympanic membrane perforation, hearing loss, facial palsy, Cerebrospinal fluid (CSF) rhinorrhea, tinnitus, vertigo or features of nasal/maxillofacial fractures, etc. Functional impairment following hearing loss, vestibular deficit, facial palsy, CSF leak and disturbed olfaction cause significant distress to these patients.

Appropriate clinical and radiological examination can detect all the ENT symptoms and signs related to head injury which in turn guides the suitable intervention and recovery pattern. This study is hence being undertaken to draw special attention to ENT manifestations necessitating hospital admission in cases of head injuries and to emphasize the role of ENT surgeons in accidents and emergencies.

Materials and Methods

This prospective observational study was done in a tertiary care hospital of Indian Army over a period of 12 months. Clearance was obtained from the Institutional Ethics Committee to conduct the study. The cases of head injury were evaluated and primarily stabilized in the Accident & Emergency (A&E) department. Some of them were directly sent from there to ENT department, whereas majority were subsequently referred from the department of Neurosurgery or Maxillofacial surgery after their initial management. Cohort of 30 consecutive such cases of head injury who needed to be treated as in-patients, were included in this study without any age or gender bias.

Case history was recorded in details including the date of trauma, mechanism of trauma, first line of treatment, and onset and progress of ENT symptoms. Complete ENT examination was done including neurotologic and maxillofacial evaluation. Evaluation for hearing status was initially done by tuning fork tests and subsequently by pure tone audiometry (PTA) after the patients were clinically stable enough to cooperate in audiometry. Pure tone average was calculated as the arithmetic mean of the air conduction (AC) thresholds calculated at frequencies of 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz. Type of hearing loss (conductive, sensorineural, or mixed) and its quantification (mild, moderate, severe, and profound) was done as per World Health Organisation (WHO) guidelines. All the patients underwent plain computed tomogram of head in A&E department and those suspected to have TBF were further evaluated with high resolution computed tomogram (HRCT) of temporal bone to map the fracture line, to find the extent of trauma and to correlate the findings with clinical features. X-ray of nasal bone was done as indicated.

Data were entered into a Microsoft excel spreadsheet and analyzed statistically by SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and Graph Pad Prism version 5. Numerical variables have been summarized as the mean and standard deviation and the categorical variables as count and percentages. One-way analysis of variance (one-way ANOVA) has been employed to compare the means of three or more samples for numerical data (using the F distribution). Unpaired proportions have been compared by Chi-square test or Fischer's exact test, as appropriate. Mann–Whitney U test has been used for non-parametric data. Z-test (Standard Normal Deviate) was used to test the significant difference in proportions. The correlation was calculated by Pearson correlation analysis. Once a t value is determined, a p-value was found using a table of values from Student's t- distribution. A calculated p-value d" 0.05 was considered statistically significant

Results

This study consisted of 30 subjects. 23 cases (76.6%) were male and 7 cases (23.4%) were female. The age range of the patients was from 19 to 69 years, mean age being 41.55 with ±13.79 Standard Deviation (SD). The

statistical dispersion showed the interquartile range (IQR) to be 31.5 to 48.5 years, median age being 38 years (Fig. 1).

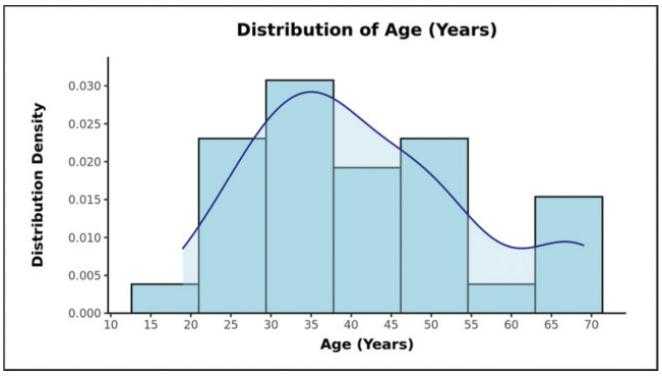

Fig. 1. Statistical dispersion of age

20 patients (67%) had sustained head injury in RTA. Head injury secondary to an accidental fall was seen in 6 cases (20%), whereas sports injury was the cause in 3 cases (10%) and seizure in one case (3%) (Fig. 2). There was no significant difference between the various groups in terms of distribution of mechanism of injury (MOI) (÷2 = 10.476, p value 0.121).

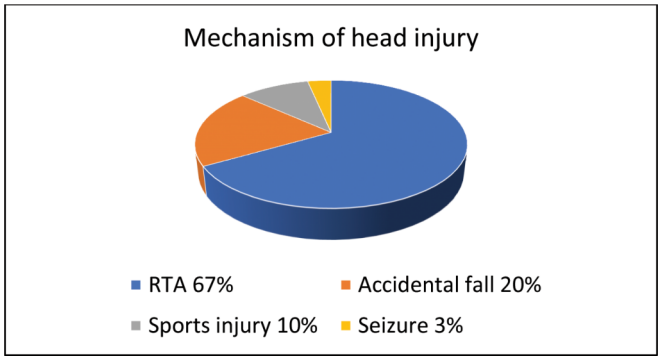

Fig. 2. Distribution of mechanism of injury

83.3% of the patients with longitudinal fracture of temporal bone had RTA while the remaining 16.7% had fall as MOI. 66.7% of the patients with transverse fracture had RTA and the remaining 33.3% had fall as MOI. 50.0% of the participants with oblique fracture had fall as MOI and rest 50% sustained fracture following seizures (Table I). Bias Corrected Cramer's V = 0.47 suggested moderate association between MOI and type of fracture.

Table I : Association of MOI with the type of TBF

MOI	TYPE OF TBF		
	LONGITUDINAL FRACTURE (N = 6)	TRANSVERSE FRACTURE (N=3)	OBLIQUE FRACTURE (N=2)
RTA	5 (83.3%)	2 (66.7%)	0
Fall	1 (16.7%)	1 (33.3%)	1 (50%)
Seizure	0	0	1 (50%)

Diagnosis of TBF was made on the basis of HRCT scans. Fractures were classified according to older method based on the relationship of fracture line with petrous bone, as well as according to the newer method of its relationship with otic capsule. 11 patients (36.7%) were found to have TBF in this study. Longitudinal TBF was seen in 6 cases (54.5%), transverse in 3 cases (27.3%) and oblique in in 2 cases (18.2%). There were 8 cases of Otic capsule sparing (OCS) type and 3 cases of Otic capsule violating (OCV) types of TBF. Based on HRCT mapping of fracture line, 2 cases (66.7%) of OCV fractures were seen in transverse fracture, while one case (33.3%) was seen in a longitudinal fracture (Fig. 3).

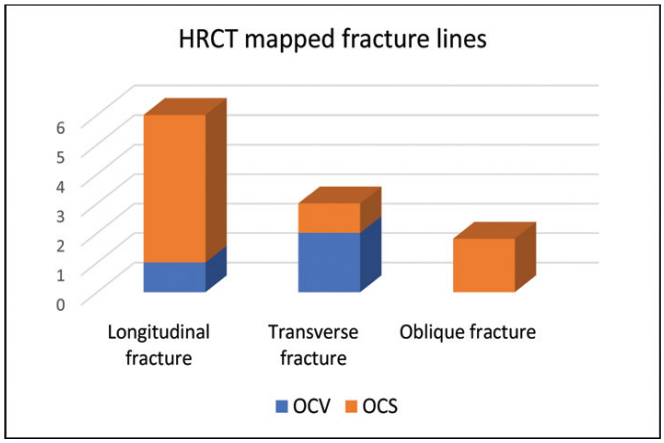

Fig. 3. Distribution of temporal bone fractures

27 patients in this study showed otological manifestations and 17 cases had nasal findings. However, there were no cases with throat manifestations. The spectrum of otological manifestations included 10 cases (33.3%) of bleeding from EAC, 2 cases (6.7%) of Battle sign, 5 cases (16.7%) of hemotympanum, 1 case (3.3%) of perforation

of tympanic membrane (TM), 16 cases (53.3%) of hearing loss, 18 cases (60%) of tinnitus, 4 cases (13.3%) of vertigo, 3 cases (10%) of nystagmus, 4 cases (13.3%) of facial palsy, and 1 case (3.3%) of CSF otorrhea (Fig. 4).

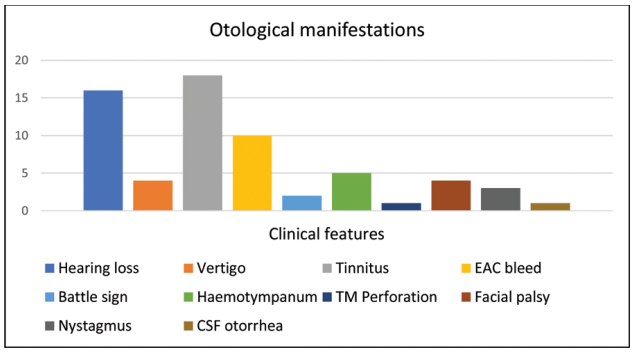

Fig. 4. Distribution of otological findings

Out of 16 cases of hearing loss, there were 6 cases with sensorineural hearing loss (SNHL) including 4 cases (25%) of severe, one case (6.25%) of profound and high frequency SNHL each. Remaining 10 cases with conductive hearing loss (CHL) included 6 patients (37.5%) with mild and 4 patients (25%) with moderate CHL. 75.0% of the patients with Severe SNHL were associated with RTA while remaining 25.0% had seizure as MOI. All the patients with Profound SNHL and High Frequency SNHL had RTA as MOI. A positive correlation ($p<0.005$) was seen between MOI and severity of hearing loss, suggestive of RTA to cause more severe type of hearing loss (Table II).

Delayed onset facial palsy was observed in 2 out of 6 cases (33.3%) of longitudinal fractures whereas immediate onset facial palsy was observed in 2 out of 3 cases (66.7%) of transverse fractures. No facial palsy was noted in cases of oblique fractures. Based on serial observation of cases of facial palsy in 90 days, recovery grading was done and out of 4 cases (13.3%), 50% cases showed complete recovery, both of which were longitudinal fractures. Partial recovery was seen in two cases of transverse fracture, where first case recovered from grade V to IV and second case showed recovery from grade IV to grade II (Table III).

All the 3 cases of OCV fractures were associated with SNHL (2 cases with profound and one with high frequency SNHL) and facial palsy (2 cases with immediate and one with delayed onset). 2 out of 3 (66.6%) were associated with tinnitus, vertigo and nystagmus (Table IV). The findings supported the fact that OCV fractures had higher incidence of otological findings.

In our study, 27 patients (90%) out of 30 were found

Table II: Correlation between MOI and SNHL

TYPES OF SNHL	MECHANISM OF TRAUMA		TOTAL NUMBER N = 6	P VALUE
	RTA	SEIZURE		
Severe SNHL	3	1	4	<0.005
Profound SNHL	1	-	1	
High frequency SNHL	1	-	1	

Table III: Recovery grade of Facial palsy at 90 days

RECOVERY GRADE OF FACIAL PALSY AT 90 DAYS	N = 4 CASES	TYPE OF FRACTURE
Complete recovery	2	Longitudinal #
Partial recovery from HB Grade V to IV	1	Transverse #
Partial recovery from HB Grade IV to II	1	

Table IV: Distribution of otological features along fracture lines

FEATURES	TOTAL NUMBER	OCS # (N=8)	OCV # (N=3)	P VALUE
EAC bleed	10	7	2	0.4909
Hemotympanum	5	4	0	0.2363
SNHL	6	3	3	0.0181
Conductive HL	10	6	0	0.0606
Facial palsy	4	1	3	0.0242
Tinnitus	18	8	2	0.2727
Vertigo	4	0	2	0.0545
Nystagmus	3	0	2	0.0545
CSF otorrhea	1	0	1	0.2727

to have nasal manifestations. One patient (3.3%) had nasal deformity, 4 patients (13.3%) had unilateral nasal bleed, 12 patients (40%) had bilateral nasal bleed, 4 patients (13.3%) had hyposmia, 3 patients (10%) had anosmia, and 3 patients (10%) had one sided CSF rhinorrhoea (Fig. 5).

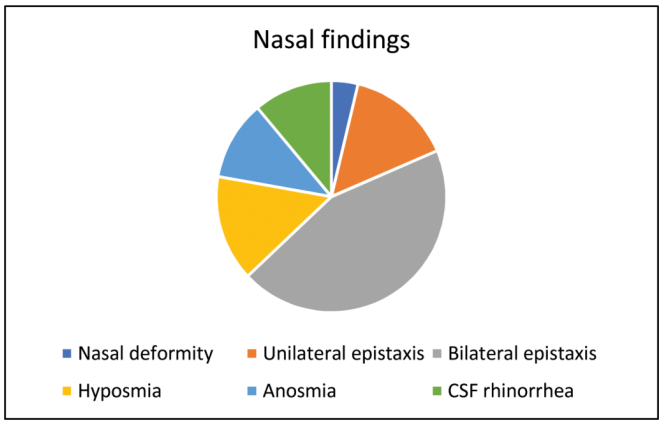

Fig. 5. Spectrum of nasal findings

All the 12 cases of bilateral epistaxis were found to have fracture of nasal bones, but only 2 patients (6.7%) had displaced fracture. CSF rhinorrhoea, which was seen in 3 patients (10%) was unilateral and 2 of these patients also had anosmia, thus establishing a positive correlation between anosmia and CSF rhinorrhoea ($\chi 2 = 11.933$, p value 0.008). Out of 4 cases of hyposmia, CSF rhinorrhoea was seen in only one patient. All the 4 cases hyposmia resolved after two months. However, out of 3 cases of anosmia, one did not show any recovery in our follow up over a period of 90 days.

Besides the ENT manifestations of the cases of head injury, some other injuries either singly or in combination, were also noted in 18 cases (60%) in our study. These included 7 cases (23.3%) of fracture zygoma-maxillary complex, 4 cases (13%) each of fracture mandible and fracture sphenoid, 3 cases (10%) of frontal bone fractures, 2 cases (6.67%) each of fracture tibia and fracture ribs, and one case (3.33%) of fracture radius-ulna. Extradural haemorrhage (EDH), subarachnoid haemorrhage (SAH) and subdural haemorrhage (SDH) were seen in a total of 7 cases (23.3%) whereas spinal injury was found in 2 cases (6.67%) (Fig. 6).

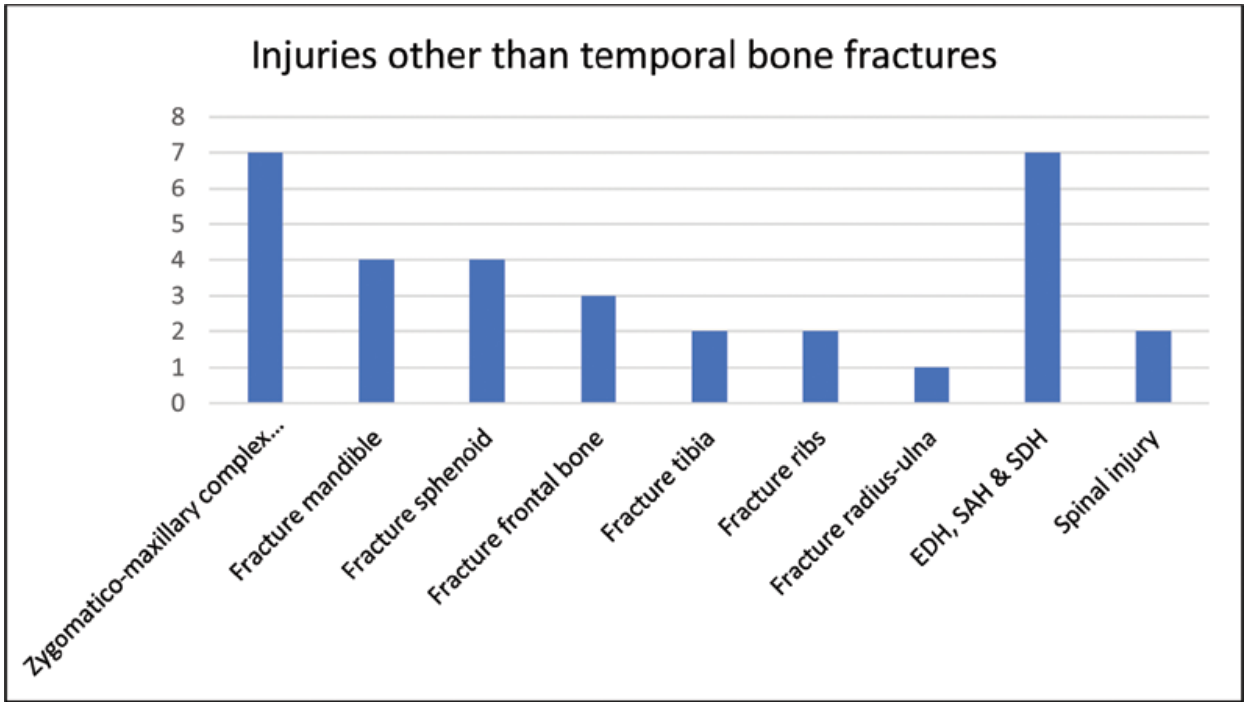

Fig. 6. Associated injuries

5 patients (17%) out of the total of 30, did not require ENT intervention, while the remaining 25 patients required management from ENT team. 22 of them were managed conservatively followed by observation. 3 patients (10%) underwent surgical intervention. Endonasal endoscopic repair of CSF rhinorrhea was done in two patients, while the third patient underwent tympanoplasty for traumatic perforation of tympanic membrane which failed to heal after three months of observation (Fig. 7).

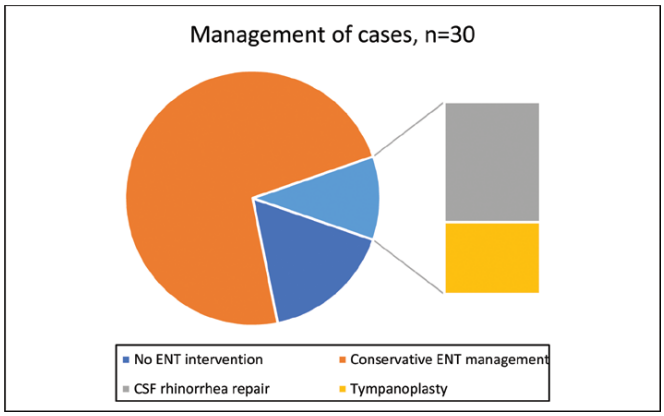

Fig. 7. Analysis of management of cases

Discussion

Head injury, which incorporates any injury to the head such as scalp abrasions, facial or dental injuries and skull bone fractures, are not only likely to cause brain injury but are also likely to be associated with ENT manifestations, maxillofacial and cervical trauma. Majority of them require a period of hospitalization, close observation, multidisciplinary clinical monitoring or surgical intervention. Head injury, associated with TBF, often merit ENT opinion and intervention due to damage to the structures housed within the temporal bone.

RTA, which was found to be the cause of head injury in 67% patients in our study, has also been reportedly blamed as the mechanism of head injury by most of the studies, including the studies by Costanza et al (67%),[4] Bouguila et al (39%),[5] Desai Esha et al (58.2%)[6] and Patil et al (58%)[7]. Whatever be the cause, male gender in the age group of 30 - 40 years is 3 to 4 times more prone to head trauma than female. Male preponderance has been noted in 67% our study, 80.61% by Desai et al[6]

and 80% by Das B et al.[8] Though the road condition, traffic load and vehicular safety design etc vary in various countries yet the bold assertive nature, indulgence in alcohol, risky job patterns may be the causes behind this demographic profile.

Grouping the clinical features into otological, nasal and throat, we came across 27 cases (90%) with otological and 17 cases (56.7%) with nasal symptoms and signs. However, there was no case with throat manifestation. Contrasting findings have been reported by Das et al[10] with ear, nose and throat findings in 35%, 50% and 15% while Desai et al[6] reported ear, nose and throat findings in 38.8%, 32% and 6.1%.

Otological manifestations in our study included 33.3% of bleeding from EAC, 6.7% of Battle sign, 16.7% of haemotympanum, 53.3% of hearing loss, 60% of tinnitus, 10% of nystagmus, 13.3% each of vertigo and facial palsy, and 3.3% each of TM perforation and CSF otorrhea. The findings were compared with the findings published in three other Indian studies by Sakthignanavel et al,[9] Patil et al[7] and Singhai et al.[10] It was found that the incidence of various otological features varied widely between these studies, even where the sample sizes were comparable (Table V). The incidence of hearing loss and tinnitus was significantly higher in our study whereas that of TM perforation was lowest.

Table V: Comparative distribution of otological features

OTOLOGICAL FEATURES	OUR STUDY (n = 30)	PATIL (n = 50)	SAKTHIGNANAVEL (n = 58)	SINGHAI (n = 200)
Ear bleed	**33.3%**	**55%**	**72.4%**	**18%**
Hearing loss	**53.3%**	**24%**	**22.4%**	**25.5%**
Tinnitus	**60%**	**8%**	**3.4%**	**6%**
Vertigo	**13.3%**	**14%**	**1.7%**	**—**
Facial palsy	**13.3%**	**10%**	**24.1%**	**2%**
TM perforation	**3.3%**	**35%**	**8.6%**	**11.5%**
CSF otorrhea	**3.3%**	**10%**	**6.9%**	**3.5%**

Head injuries, resulting in TBF, often lead to hearing loss which may be of immediate onset or delayed. Hearing loss may be conductive, sensorineural or mixed. CHL resulting from EAC clots or haemotympanum may be transient, but CHL due to TM perforation or disruption of ossicular chain do not recover without tympano-ossicular plastic surgery. SNHL in such cases have been attributed to cochlear concussion due to microfracture in otic capsule,[11] avulsion or direct injury to acoustic nerve, disruption of membranous labyrinth, perilymph leakage as result of disruption of endosteum of round and oval window, labyrinthine vasospasm/thrombosis or hemorrhage, occlusion of vestibular aqueduct resulting in secondary hydrops.[12] The incidence rates for post-TBF CHL and SNHL have been reported to be 10 to 57% and 0 to 14% respectively. The incidence rate was 33.33% for CHL and 20% for SNHL in our study which grossly differed from the data of 18% for CHL and 6% for SNHL by Patil et al[7] and 15.5% for CHL and 6.9% for SNHL by Sakthignanavel et al.[9]

Injury to the facial nerve can be caused by compression, contusion, stretching, perineural or intraneural hematoma, and/or nerve transection.[13] The nerve has a long circuitous course in the temporal bone which makes it vulnerable to injury at multiple sites in the event of TBF. Facial palsy was seen in 13.33% of head injury cases in our study which was not comparable with 10% by Patil et al,[7] 24.1% by Sakthignanavel et al[9] and 2% by Singhai et al.[10] When the data was analysed for

facial palsy in cases with TBF, it was found to be 54.54% in our study which was significantly higher than the incidence reported in Western studies such as 1.6% by Schuble et al,[14] 7%, by Brodie and Thompson[15] and 12.3% by Yetiser S et al.[16] When the palsy is of delayed onset or is incomplete, systemic steroid is the mainstay of treatment, but in immediate onset complete palsy, the dilemma crops in whether to decompress or to proceed with conservative management. We followed the conservative path leading to complete recovery in 2 cases of delayed onset palsies and partial recovery in the remaining 2 cases of immediate onset palsies.

Kreuzer PM et al studied the symptom of tinnitus in 1604 post-trauma patients using a validated questionnaire and found that 241 patients blamed trauma to be the cause of their tinnitus, with only 28 patients (1.74%) considered head injury to be the isolated trigger for their tinnitus.[17] In our study, it was interesting to find 18 cases (60%) of tinnitus which was much higher than 8% by Patil et al,[7] 3.4% by Sakthignanavel et al[9] and 6% by Singhai et al[10] in their studies of head injuries. Though exact cause is not known but the factors contributing to post-head injury tinnitus may be cerebral/labyrinthine concussion, mild TBI, SNHL, labyrinthine fistula, otolithic displacement, endolymphatic hydrops and psychological stress.

Factors, similar to the ones causing post-head injury tinnitus, may also be responsible for vertigo. Sakthignanavel et al[9] reported only 1.7% such cases, where as our finding of 4 cases (13.3%) cases was similar to 14% by Patil et al.[7] Two of our cases had OCV fracture of temporal bone, SNHL and facial palsy, while the remaining 2 cases had no fracture, facial palsy or hearing loss. Tinnitus was a constant symptom whereas CSF leak was detected in only one of these cases (Table VI).

Whenever facial trauma is associated with head injury, epistaxis is the commonest feature in the spectrum of nasal manifestations. Epistaxis in head injury with nasal trauma or LeFort I type fracture is often mild and can be managed with conservative measures, but it can be life threatening in LeFort type II and III fractures resulting from intense force. However, a LeFort I type displaced fracture resulting from low force trauma may also pose danger to life if there is an arterial injury, as was reported by Kotoh et al.[18] Epistaxis was seen in 53.3% cases in our study, whereas it was only 16.5% in the study by Singhai et al.[10] Our cases were managed successfully with Trotter's manoeuvre and local ice packs in all but four cases requiring nasal packing.

Olfactory impairment can result from virtually any cause of head injury, and is estimated to occur in 23.6%

Table VI: Association of vertigo with other otological features

CASES OF VERTIGO	ASSOCIATED OTOLOGICAL FEATURES					
	TINNITUS	HEARING LOSS	FACIAL PALSY	NYSTAGMUS	CSF OTORRHEA	TYPE OF TBF
Case 1	Present	Bilateral severe SNHL	Immediate onset complete	Spontaneous 1st degree left beating	Absent	OCV
Case 2	Present	No hearing loss	No facial palsy	Positional rotatory fatigable	Absent	No fracture
Case 3	Present	No hearing loss	No facial palsy	Spontaneous 2nd degree left beating	Absent	No fracture
Case 4	Present	Profound SNHL	Immediate onset complete	Spontaneous 3rd degree	Present	OCV

and 26.6% of motor vehicle accidents and domestic falls, respectively.[4] Head injury does not always cause anosmia but the severity of TBI and longer duration of cognitive impairment predispose to impairment of chemosensory function of olfaction. Prerequisite for a functional olfactory system are non-obstructed nasal airway and intact neuronal pathway. The system may malfunction following obstructed sinonasal airway, traumatized olfactory nerve fibers at the cribiform plate or contusion of olfactory bulb or cortex. Ensuring early sinonasal patency promises a good recovery from hyposmia or anosmia, but traumatic neurosensory deficit makes the impairment non-reversible. Anosmia was seen in 1% cases in the study by Singhai et al,[10] we found hyposmia in 13.3% cases and anosmia in 10% cases in our study.

Head injury, caused by RTA, seldom occurs in isolation but is often associated with injury to the structures in ENT, faciomaxillary region, or even ribs and limbs. The comprehensive evaluation and management of these patients merits a team work among otolaryngologists, trauma surgeons, neurosurgeons, radiologists, and intensivists. Injuries to structures other than ENT were seen in 60% cases in our study, while Singhai et al[10] and Das et al[8] reported 27% and 11.8% respectively. Fracture of zygomatico-maxillary complex was noted in 23.3% cases in our study which was similar to 25% by Desai E et al.[6] Interestingly the incidence of SAH, SDH and EDH in 23.3% in our study was similar to 22.5% reported by Sakthignanavel et al.[9]

Conclusion

Head injury, which is often caused by RTA, may not only result in TBI but may also cause ENT complications, maxillofacial fractures and trauma to other body parts. Majority of them require a period of hospitalization, multidisciplinary clinical monitoring or surgical intervention. Head injury, associated with TBF, often merits ENT opinion and intervention.

TBF may cause significant morbidity by injuring the important structures housed inside. Yet, since medical attention is primarily directed to the life-saving management of critical intracranial injuries, ENT manifestations often go unnoticed or are over looked. Patients subsequently present with delayed manifestations and functional impairment following hearing loss, vestibular deficit, facial palsy, CSF leak and disturbed olfaction causing significant distress to these patients.

It is, therefore, important to identify and treat the ENT complications in the cases of head injuries at the earliest in order to avoid the long-term morbidity associated with functional handicaps. It is equally important to recognize the necessity of team work among otolaryngologists, trauma surgeons, neurosurgeons, maxillofacial surgeons and radiologists for the comprehensive evaluation and management of these patients.

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Medial versus Lateral Approach for Thyroidectomy

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ABSTRACT

Introduction

Thyroid nodules are common clinical findings, with a prevalence of approximately 5-10% in the general population. The choice of surgical approach - medial versus lateral - can significantly impact patient outcomes.

Materials and Methods

This was a retrospective study of 30 patients of clinically diagnosed thyroid nodules. The study was carried out at the department of ENT of a tertiary care medical college and hospital during the period of one year.

Results

The majority of the patients were in the age range of 21 to 40. The ratio of male to female was at 1:6.5. Most often, there was swelling in front of the neck. Benign Thyroid Nodule was the most prevalent type of isolated thyroid enlargement The mean estimate blood loss was 100ml for the median (central) surgical approach (Group-A) and 120 ml for the lateral surgical method, the Group-A and Group-B had an average operating time of 45 and 65 minutes, respectively, both these parameters are statistically significant.

Conclusion

Median surgical approach is better than lateral surgical approach in terms of average blood loss an operative time.

Keywords

Thyroid Nodule; Thyroidectomy; Surgical Procedures operative; recurrent laryngeal nerve injuries; post op complications; Median Surgical Approach & Lateral Surgical Approach

Thyroid nodules are common clinical findings, with a prevalence of approximately 5-10% in the general population (Fig. 1).[1]

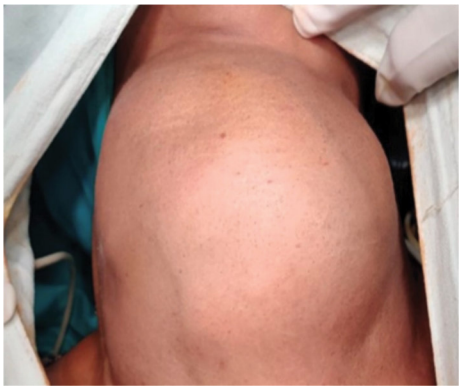

Fig. 1. An asymptomatic thyroid nodule notice on routine physical examination

While most nodules are benign, a significant subset can be malignant, necessitating surgical intervention.[2] Thyroidectomy, the surgical removal of all or part of the thyroid gland, remains a definitive treatment for both benign and malignant nodules, with the goal of symptom relief, cosmetic improvement, and cancer control.[3]

The choice of surgical approach - medial versus lateral - can significantly impact patient outcomes. The medial approach typically involves a central neck incision and direct access to the thyroid gland, allowing for comprehensive visualization and dissection. Conversely,

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the lateral approach, which may include techniques such as the retroauricular or minimally invasive approaches, can offer reduced scarring and potentially shorter recovery times.

Previous studies have examined various aspects of thyroidectomy, including complications, operative time, and postoperative recovery.[4] However, a direct comparison between medial and lateral approaches remains limited.[5] Understanding the differences in outcomes between these two surgical techniques is crucial for optimizing patient care.[6,7]

This retrospective comparative study aims to evaluate the outcomes of medial versus lateral surgical approaches in thyroidectomy for thyroid nodules.[8] We hypothesize that the choice of approach may influence operative metrics such as duration, complications, and recovery, ultimately affecting patient satisfaction and quality of life.[9,10] By analyzing a cohort of patients who underwent thyroidectomy, this study seeks to provide insights that may guide surgical decision-making and improve patient outcomes.

Materials and Methods

This was a retrospective study of 30 patients of clinically diagnosed thyroid nodules. The study was carried out at the department of ENT of a tertiary care medical college and hospital during the period of one year. All patients with thyroid nodules underwent provisional diagnoses on the basis of history, physical examination of the neck, ultrasound for the thyroid gland, serum thyroid stimulating hormone level, fine needle aspiration cytology, and biopsy whenever it was required. Clinical information was collected on sex, age thyroid disease, and histology. Before surgery, patients were assigned either to the thyroidectomy by medial surgical approach (Group-A) (Figure 2).

Defined as a standard open thyroidectomy with a midline incision (Figure 3), allowing direct access to the thyroid gland and comprehensive visualization of surrounding structures and thyroidectomy by lateral surgical approach (Group-B). Same midline incision was used but retraction of sternocleidomastoid laterally so that exposure of lateral border (Figure 4) and aimed at less chances of injury to neurovascular structures thus

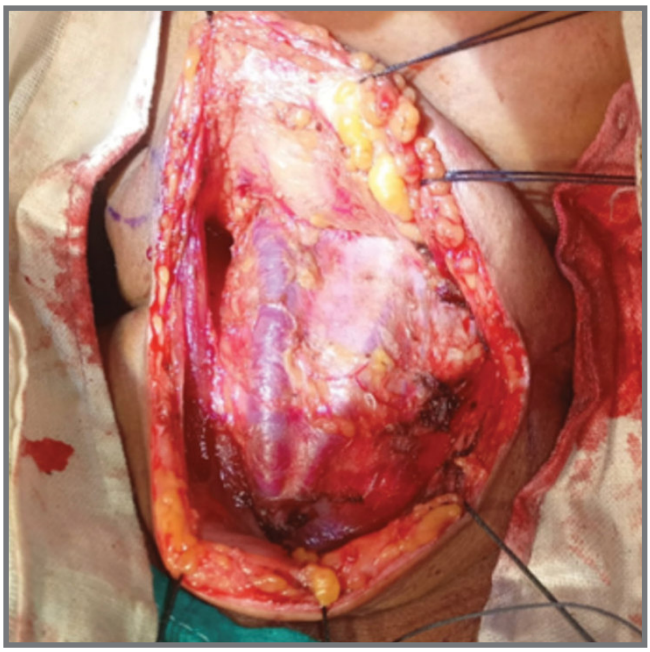

Fig. 2. Subplatysmal Flap

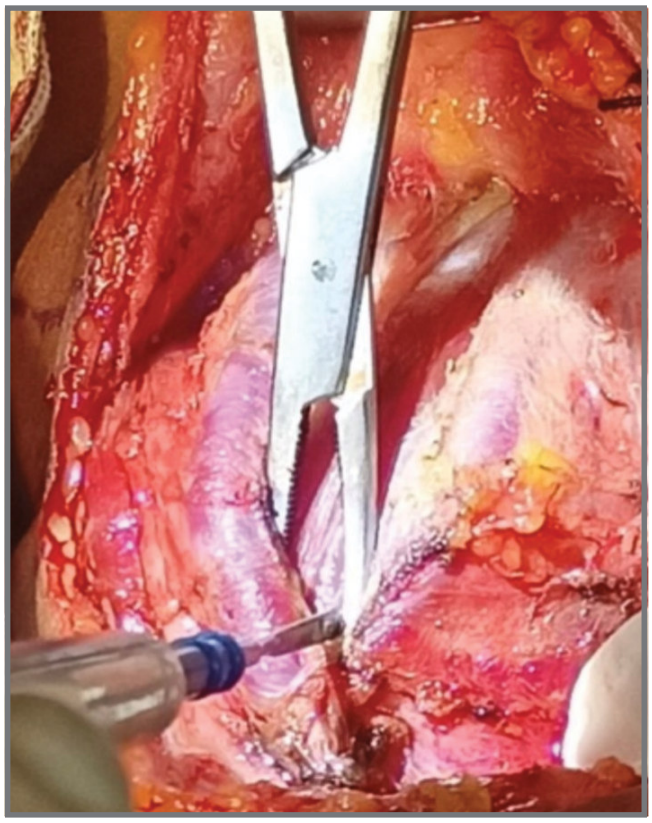

Fig. 3. Midline Incision

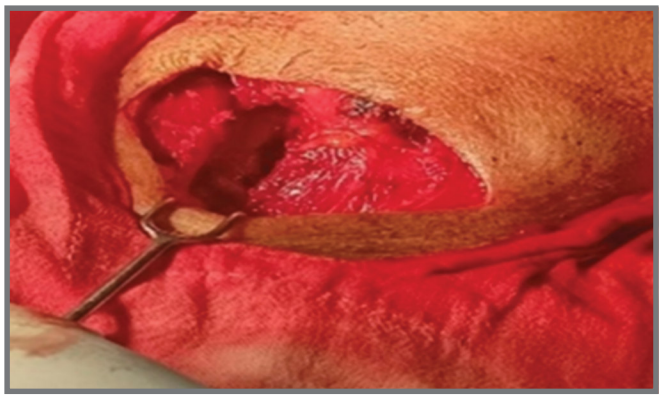

Fig. 4. Lateral Approach- Retraction of SCM

enhancing recovery. Outcome measures were operative time, intraoperative bleeding, and complication rates including injury to the RLN, the external branch of the superior laryngeal nerve (EBSLN), or the parathyroid glands.

Results

The majority of the patients were in the age range of 21 to 40.

Table I : The ratio of male to female was at 1 : 6.5

AGE GROUP (YEARS)	MALE	FEMALE	TOTAL
11–20	1	8	9
21–30	2	5	7
31–40	1	10	11
41–50	0	2	2
51–60	0	1	1
>60	0	0	0
Total	4	26	30

Most often, there was swelling in front of the neck. Benign Thyroid Nodule was the most prevalent type of isolated thyroid enlargement (Table-II).

Table II : Distribution of various conditions by high-resolution ultrasonography findings among cases

USG DIAGNOSIS	NUMBER OF CASES (%)
Benign thyroid nodule	16 (53.34)
Colloidal cyst	9 (30)
Multinodular goiter	3 (10)
Hashimoto thyroiditis	1 (3.34)
Thyroid malignancy	1(3.34)
Total	30 (100)

The mean estimate blood loss was 100 ml for the median (central) surgical approach (Group-A) and 120 ml for the lateral surgical method (Table III).

Table III: Comparison of the mean blood loss (ml) between two groups during surgery

GROUP A	GROUP B
n 15	15
Mean±SD 100±17	120±17
T 2.112	
P<0.05 (S)	

SD: Standard deviation, S: Significant

The Group-A and Group-B had an average operating time of 45 and 65 minutes, respectively (Table IV).

Table IV : Correlation between mean duration (minute) of surgery between two groups during surgery

GROUP A	GROUP B
n 15	15
Mean±SD 45±5	65±5
T 8.112	
P<0.001	
IF HS	

SD: Standard deviation, HS: Highly significant, IF: Highly significant

One patient in Group-A had recurrent laryngeal nerve paresis.

Discussion

Thyroid enlargement, whether diffuse or nodular, leads to a battery of investigations, mainly to rule out the possibility of neoplastic or no neoplastic lesions. Timely intervention in nodular lesions of thyroid can significantly reduce morbidity and mortality.[11] In the present study, the highest incidence of solitary thyroid nodule was found in the age group of 21–40 years. This result is comparable to the results obtained by Venkatachalapathy and Sreeramulu[12] the observed female to male ratio was 5.6:1. This female preponderance is reflected in all studies including the present. A similar observation was made by Vyas and Vijayvargiya on 100 patients with thyroid nodules where the ratio was 7:1.[13] In this study, all patients (100%) had swelling over the anterior aspect of the neck. A similar observation was done by Huque et al. on 118 patients with solitary thyroid nodules and found that thyroid swelling was the most common presentation in all cases (100%).[14] Jyotirmoy Phookan et al stated that out of the two approaches, lateral approach thyroidectomy showed better results with fewer complications. A single structure (superior belly of omohyoid) can be used as a guide to preserving all vital structures related to the thyroid gland[15] which was similar to our study that despite longer surgical times and more blood loss, (average operative time 90 minutes and 135 minutes, average blood loss 100 ml and 80 ml respectively) the chance of injury to vital structures is less frequent in lateral surgical approach thyroidectomy than Median surgical approach thyroidectomy.

Conclusion

In conclusion, this study underscores the importance of evaluating surgical approaches in thyroidectomy for thyroid nodules. The median approach appears to offer distinct advantages, including reduced operative time, lower blood loss, and improved postoperative recovery, while maintaining a comparable safety profile to the lateral approach. These findings suggest that the median approach may be preferable in specific patient populations, enhancing both the surgical experience and patient outcomes. However rare instances of nerve damage is slightly more in median approach which can however be overcome by more meticulous dissection. Ultimately, the decision regarding the surgical approach should be individualized, considering patient-specific factors and surgeon expertise. Further research is warranted to refine guidelines and optimize surgical management in thyroid disease.

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Main Article

Facial Nerve Identification during Parotidectomy by a Safe and Reliable Convergence Technique

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ABSTRACT

Introduction

Parotidectomy is the technically challenging surgery where identification of facial nerve becomes utmost important to avoid aesthetic and functional complications. In our study we aim to describe a reliable and easy triangle technique to identify the facial nerve trunk.

Materials and Methods

A prospective observational study was carried out in the department of ENT at a tertiary care centre from February 2023 to February 2025. 30 patients presenting with parotid swelling to the department were evaluated and taken up for parotidectomy (superficial/total) based on clinical, radiological findings. Surgical procedures were done by using the convergence technique for identification of the facial nerve trunk. Pre-op and post-op facial nerve function was monitored clinically using House Brackmann grading.

Results

30 patients were selected for the study. Majority of the patients were males [21;70%]. Mean operative time was 80 ± 6.1mins. Most of the patients underwent superficial parotidectomy (76.67%). Pleomorphic adenoma (63.3%) was the most common tumour of parotid gland. The facial nerve was identified by convergence technique in all cases. Postoperatively temporary palsy of marginal mandibular nerve was present in 3 cases.

Conclusion

Convergence technique is a safe & reliable landmark for the identification of facial nerve trunk during parotid surgery. It can help in reducing facial nerve injury during parotidectomy.

Keywords

Facial nerve; Mastoid; Parotid Gland

The facial nerve is the seventh cranial nerve which contains sensory,motor, parasympathetic nerve fibers that provides innervation to many regions of the head and neck. It is one of the most important structures encountered during parotidectomy. The neurovascular structures that pass through the parotid gland from lateral to medial are facial nerve, retromandibular vein, external carotid artery, superficial temporal artery and maxillary artery.[1,2] The greater auricular nerve emerges along the posterior aspect of the sternocleidomastoid muscle at the Erb's point, ascends vertically across the oblique sternocleidomastoid muscle and its branches enter the gland from the neck and remains superficial.[3] Parotidectomy is indicated for various benign and malignant neoplasms, chronic inflammatory diseases, sialolithiasis, intra-parotid cysts/ sinuses and lymphadenopathy and many other diseases of parotid. There are various techniques published in literature for identification of facial nerve. In this studywe aim to elaborate the importance of convergence technique[4] of identification of facial nerve which helps to reduce the injury to facial nerve during parotidectomy.

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Materials and Methods

A prospective observational study was carried out in the

department of ENT at a tertiary care centre from February 2023 to February 2025.

Number of patients: 30

Inclusion criteria:

a) Patients in age group between 15-60years.

b) Patients presenting with parotid swelling (benign & malignant; Fig. 1).

c) Patients who gave written informed consent for the study.

Exclusion criteria:

a) Patients who did not give consent for the study.

b) Patients in age group less than 15years and more than 60 years.

c) Patients with inflammation of parotid (parotitis).

Patients were evaluated clinically and subjected to radiological investigations (Ultrasonography & contrast enhanced magnetic resonance imaging of parotid and neck; Fig. 2) and FNAC (Fine needle aspiration cytology) of the swelling Patients were taken up for parotidectomy (superficial/total) based on the findings. Surgical procedures were done by using the convergence technique for identification of the facial nerve trunk. Modified blair's

Fig. 1. Left parotid swelling

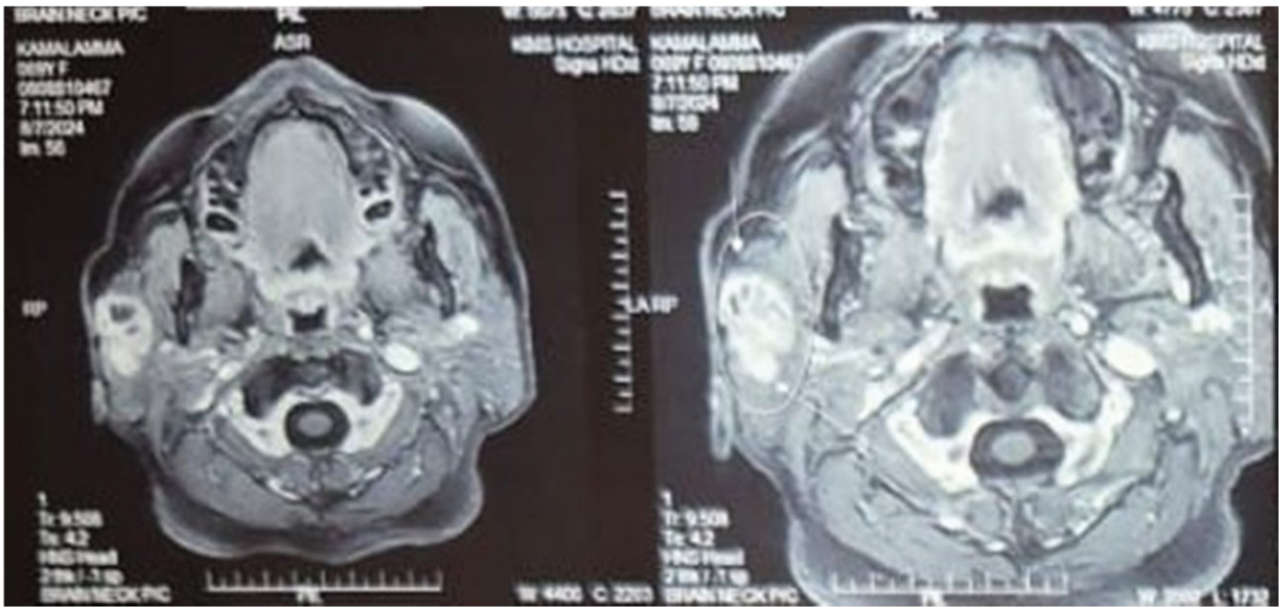

Fig. 2. Contrast enhanced MRI of parotid swelling

incision was made. Skin subcutaneous tissue dissected. Superficial musculoaponeurotic system (SMAS) & subplatysmal flaps were elevated. Greater auricular nerve identified and branch to ear lobule preserved. The tail of parotid is dissected off from sternocleidomastoid. Posterior belly of digastric is exposed and its attachment to mastoid is identified . The preauricular space is opened by dividing attachments of parotid gland to cartilaginous external auditory canal. The tragal pointer is identified. Dissection is further carried deeper to expose styloid process (Fig. 3).

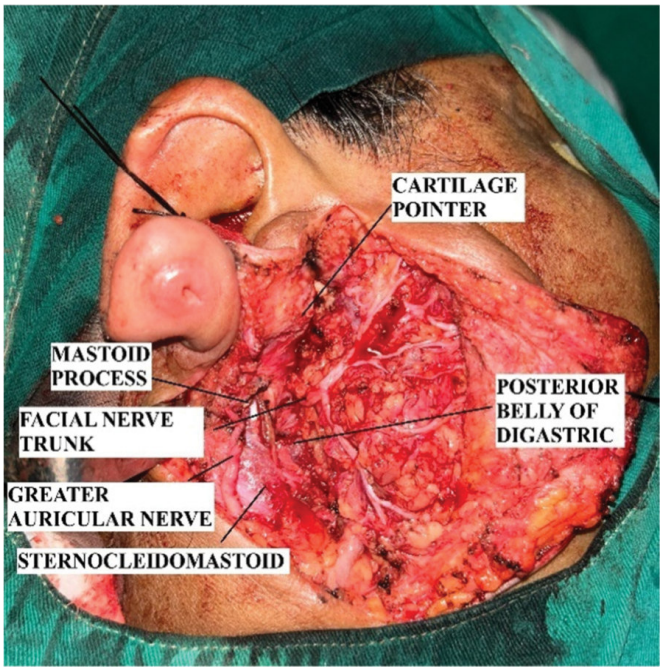

Fig. 3. Anatomical landmarks for facial nerve identification

Triangle Landmarks:[4] A triangle (Fig. 4) was made from

a. The tragus to the mastoid tip anteriorly,

b. Along the long axis of the tragus to the styloid process

c. From the mastoid tip crossing the insertion of the posterior belly of the digastric muscle to the styloid process.

Facial nerve trunk identification by convergence technique : The facial nerve trunk was identified at the point of convergence of the lines from the tragal pointer and mastoid tip across the posterior belly of the digastric muscle to the styloid process (A meeting point lateral to the styloid process at the stylomastoid foramen).

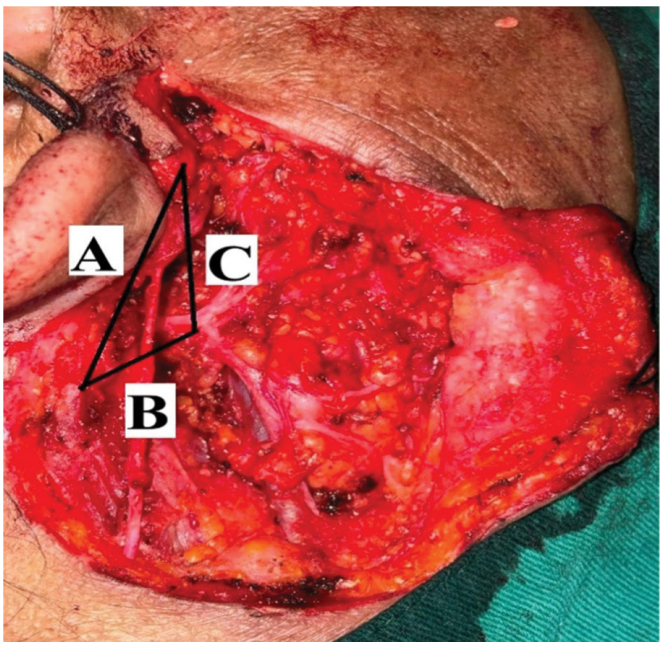

Fig. 4. Convergence triangle formed by A) line from tragal pointer to mastoid tip; B) line from mastoid tip to styloid process ; C) line from tragal pointer to styloid process

The most easily identifiable and anatomically constant landmarks (tragal pointer, posterior belly of digastric, styloid process) were selected and their respective distance to the facial nerve main trunk was measured. Pre-op and post-op facial nerve function was monitored clinically using House Brackmann grading. Patients were followed for a period of 6 months and facial nerve function was evaluated clinically using House Brackmann grading. The data was presented with descriptive statistics using mean, range and percentages.

Results

30 patients were selected for the study (table I). Majority of the patients were males [21;70%]. Mean operative time was 80 ± 6.1mins. Most of the patients underwent superficial parotidectomy (76.67%). Pleomorphic adenoma (63.3%) was the most common tumour of parotid gland.The facial nerve was identified by convergence technique in all cases. Postoperatively

temporary palsy of marginal mandibular nerve was present in 3 cases. The respective distances fromtragal pointer, posterior belly of digastric, styloid process to the facial nerve main trunk is depicted in table II.

Table I : Characteristics of study patients

CHARACTERISTICS	NUMBER
Total patients	30
Mean age	42 ± 2.1 years (19 yr – 60 yr)
Male Female M:F ratio	21 (70%) 09 (30%) 2.3:1
Operative time	Range – 60 – 140 mins Mean – 80 mins ± 6.1
Surgery	
Superficial parotidectomy Total parotidectomy	23 (76.67%) 7 (23.33%)
Hisopathological examination	
Pleomorphic adenoma Warthins tumour Parotid sialadenitis Parotid cyst Parotid sinus Adenoid cystic carcinoma Mucoepidermoid carcinoma Squamous cell carcinoma	19 (63.3%) 03 (10%) 02 (6.67%) 02 (6.67%) 01 (3.33%) 01 (3.33%) 01 (3.33%) 01 (3.33%)
Complications	
Temporary facial palsy Permanent facial palsy	03; marginal mandibular branch 00

Table II : Distance between anatomical landmarks and facial nerve trunk

LANDMARKS	MEAN DISTANCE
Tragal pointer to facial nerve trunk	12± 1.3 mm (10-15mm)
Posterior belly of digastric to facial nerve trunk	6.7 ± 0.5mm (5-10mm)
Styloid process to facial nerve trunk	9.2mm ± 0.5mm (4.1 -17.9mm)
Base of styloid process to superior border of origin of posterior belly of digastric	0.70 cm ± 0.3cm (0.42 – 0.96 cm)

Discussion

The extratemporal course of facial nervestarts from its exit from the stylomastoid foramen. It travels a short distance and then divides into two major branches namely upper zygomatico-temporal and lower cervico-facial branches. These branches supply the ipsilateral face, eye, forehead, temporal region and upper neck.[5,6]

The facial nerve is closely related to the parotid gland and other vascular structures which pass through this gland. So injury to the nerve trunk or its branchescan cause functional and aesthetic problems to the patient. As a result, it is of utmost importance to identify and preserve the facial nerve. In this study facial nerve trunk (FNT) and its brancheswere identified with relative ease and preserved by means of convergence technique.

Stylomastoid foramen (SMF) isa very constant palpatory landmark for facial nerve situated posterolateral to the styloid process from where the FNT exitsthe temporal bone. In this study the convergence point was taken as a reliable landmark based on the styloid process using the triangle technique described above to locate the FNT from the SMF.

Another landmark for FNT is tragal pointer (TP) and the nerve usually lies approximately 1-1.5 cm deep and slightly antero-inferior to the tip of the tragal cartilage (TC).[7,8] The only drawback of this is that it is a cartilaginous structure which is mobile, asymmetrical having a blunt and irregular tip. In this study convergence point was marked on the basis of styloid process with another anatomical landmark such as SMF, TC and TP. In this study triangle was considered to find out the point of convergence where mastoid process was taken mainly a outer palpatory landmark, the process lies deep to the insertion of the sternocleidomastoid muscle (SCM). Posterior belly of the digastric (PBD) lies medial to SCM. The FNT lies approximately 1.0cm deep to the medial attachment of the posterior belly of the digastric muscle to the digastric groove of the mastoid tip which is easily identifiable by drawing a line from the MT along the PBDM to the styloid process which corresponds to the other published literature.[9,10] In this study it was observed that this line meets to a point posterolateral to the styloid process with another line drawn from TP to styloid process; that is the convergence point lies over the FNT. In the present study, we found that the facialnerve trunk lies at a distance of 6.7±0.5mm mm from PBD. Rea et al. demonstratedthat the main trunk of the facial nerve was found to lie5.5 ± 2.1 mm from the PBD.[11]

The present study was done to locate the ease and accuracy of facial nerve identification using the triangle formed by the tragal cartilage, the mastoid tip and the styloid process. The FNT was accurately and quickly found at the point of convergence of the long axis from the TP to SP and from MT across the PBDM to styloid process. Postoperatively temporary palsy of marginal mandibular nerve was present in 3 cases secondary to handling and edema of nerve branch during dissection which recovered within 3 months with treatment.

Conclusion

Parotidectomy is a technically challenging surgery. Thissurgery becomes less complicated for thesurgeon once the facial nerve trunk is identified. Foreasy and prompt identification of the nerve trunk, thesurgeon needs to systematically look for the anatomicallandmarks. The point of convergence of the triangle technique is the consistent, prominent and easily identifiable anatomical landmark described in this article and it allowed a fast and safe identification of the facial nerve and will be of significant help during parotid surgery. The final success of the surgery depends to a vast extent on the safe handling of the facial nerve.

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Case Series

Management of Benign Neck Swellings involving Different Compartments – Case Series

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ABSTRACT

Introduction

Neck has a complex anatomy with important neurovascular structures and divided into several compartments. Swellings of different etiology and pathogenesis occur in the neck giving rise to varied signs and symptoms. Surgical management of such swellings may be difficult as their location may be related to important neurovascular structures of neck giving rise to complications if any inadvertent injury happens during surgery. The main objective of this study is to enlighten the difficulties and complications we faced in managing a series of 4 cases with different neck swellings in different compartments.

Case Series

In this article, we present 4 different cases of neck swellings – cystic hygroma, huge autoimmune thyroid swelling, deep part of submandibular gland sialolithiasis and submental arteriovenous malformations having different etiology arising in different compartments related to different structures with their management.

Conclusion

To manage a case of neck swelling proper history, examination, appropriate investigations and thorough anatomical knowledge of site, fine surgical skills with experience may be required to prevent complications and to perform successful surgery.

Keywords

Cystic Hygroma; Arteriovenous Malformations, Submandibular Gland Sialolithiasis, Graves Disease

Neck anatomy is very complicated as numerous important vascular and neural structures with variable course and depth traverse through it. The neck is divided into several compartments and subdivisions for easy understanding. Anterior and posterior triangles are the main subdivisions. Anterior triangle is divided again into sub mental, submandibular in superior division and muscular and carotid triangles in inferior division.[1] Each triangle is composed of muscles, nerves, vasculature, lymphatic's, and adipose tissue. Different types of swellings with different aetiology, pathogenesis and different presentation occur in the neck. Neck swellings may be benign or malignant. The most common benign neck swellings are thyroid swellings, salivary gland swellings and cervical lymphadenopathy. Thyroglossal cysts, branchial cleft cyst and lymphatic malformation etc., are less common pathologies presenting as neck swellings.[2] Once a case of neck swelling comes detailed history and examination, investigations like ultrasound [USG], Computerised Tomography [CT] scans, Fine needle aspiration cytology [FNAC] to be done .A good clinical, radiological, and cytological correlation is necessary to plan surgical intervention.[3] Here with we are reporting a series of **4** cases with benign neck swellings with different aetiologies', different presentation confining to different divisions of neck with their management.

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Case Series

Case 1:

A 30 year old female patient came with swelling over

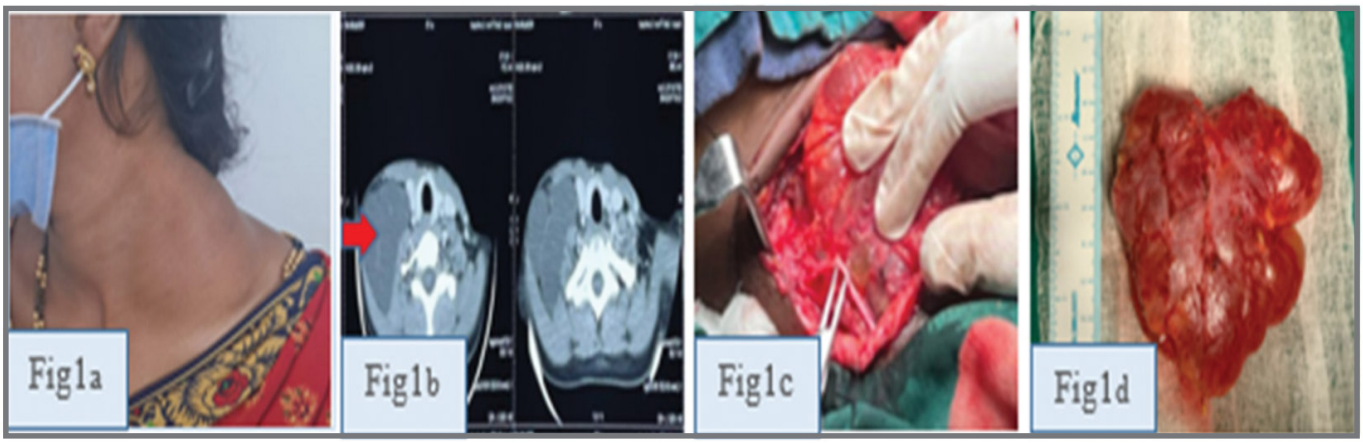

Fig. 1. 1a: Clinical image of patient showing extension of the swelling; 1b: CECT scan showing the lesion; 1c: Instrument pointing at Spinal accessory nerve; 1d: Multiloculated cystic mass after excision.

left lateral side of neck since 2 years, gradually increased in size, not associated with any pain, discharge, trauma or surgery history and difficulty in neck movements. On examination, a lobulated oval swelling of size 10cm × 8cm was noted extending from hyoid superiorly to clavicle inferiorly and from medial border of left sternocleidomastoid medially to medial border of trapezius laterally (Figure 1a). USG, FNAC and CECT neck (Figure 1b) were suggestive of cystic hygroma. CECT showed the cystic mass was pushing left internal jugular vein (IJV) medially and was just adjacent to it.

Surgical excision was planned keeping in mind the chances of encountering IJV bleed and spinal accessory nerve damage. A linear incision extending from anterior border of left sternocleidomastoid to anterior border of left trapezius muscle was taken. Sub-platysmal flaps were elevated and external jugular vein was noted over the lesion and was separated from it. The lesion was separated initially from IJV anteromedially with the help of cottonoid dissection under sternocleidomastoid, not using any sharp instruments and then the surrounding structures. Laterally in the base of swelling spinal accessory nerve was identified slightly adhered to swelling in its floor and was preserved (Figure 1c). Huge multiloculated cystic mass was excised (Figure 1d) and on examination of floor of the cyst it had sternocleidomastoid anteriorly, posteriorly trapezius muscle was noted with spinal accessory nerve traversing between and middle part of inferior belly of omohyoid was noted near to inferior portion of dissection site. As the swelling was in superficial plane superficial to the prevertebral fascia phrenic nerve, subclavian vessels and brachial plexus were not visualized. later the surgical site was closed in layers with drain in-situ. Histopathology confirmed the lesion as cystic lymphangioma. Postoperative period was uneventful and the drain was removed after 3 days. On follow-up after 6 months, patient is doing fine with no signs of recurrence.

Case 2:

A 28 year old female patient came with chief complaints of huge neck swelling on anterior aspect of neck (Figure 2a) since 10 years with associated symptoms of heat intolerance, profuse sweating, weight loss, irritability. Patient also had complaints of gradual change in voice due to pressure effects on anterior neck since 6 years, difficulty in breathing and swallowing since 1 year. Patient was a known case of hyperthyroidism and was on Tab Neomercazole 20 mg twice a day since 13 years.

On examination, a diffuse thyroid swelling over anterior aspect of neck with right lobe measuring 8 x 5 cms and left lobe measuring 7 x 5cms was noted (Figure 2a). The mass was extending from hyoid bone superiorly, suprasternal notch inferiorly and laterally till medial border of sternocleidomastoid muscles on both sides. Lower

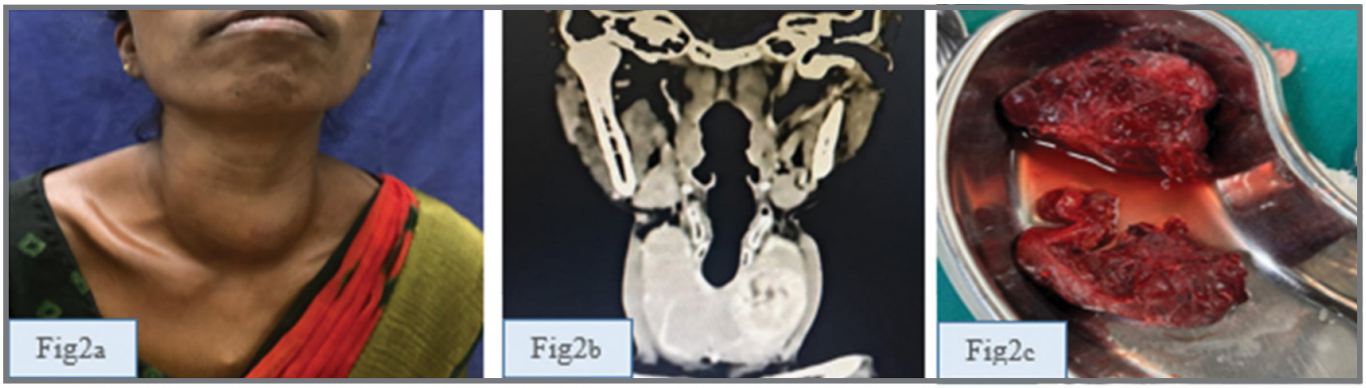

Fig. 2: 2a: Extension of anterior neck swelling; 2b: CECT neck showing nodular lesion in left thyroid lobe ; 2c: Total thyroidectomy specimen showing left lobe with isthmus and right lobe separately

border of the swelling was palpable. USG neck reported as both lobes of thyroid and isthmus are enlarged with increased echotexture and internal vascularity with TIRADS 4 nodule in left lobe. FNAC showed features of Hashimoto's thyroiditis. CECT neck reported as thyroid gland is diffusely enlarged in size measuring 3 x 2.6 x 8 cms on right side and 3.9 x 3.4 x 7cms on left side with heterogeneous enhancing nodular lesion in left thyroid lobe with extension to isthmus(Figure 2b). Lab investigations revealed T4-3.56, T3-1.05 which are in normal range and TSH- 5.99 which is slightly on higher side, Anti TPO antibodies – 49 IU/ml. Rest of the investigations were within normal limits. Nuclear scanning was not done as patient is not affordable and as no signs of hyperthyroidism were noted clinically and in biochemical investigations .

Pre-operative preparation of the patient involved an expert opinion from Endocrinologist in view of thyroid hormone imbalance for which no comment on preoperative beta blockers was given as the patient thyroid levels were in hypothyroid state at time of plan of surgery and she didn't show any clinical features of hyperthyroidism. Informed consent was taken anticipating intra and post-operative complications. Initially, a horizontal incision of size 8 cms was given over the neck 2 cms above the suprasternal notch, subplatysmal flaps elevated, left hemi-thyroidectomy was done after tracing left recurrent laryngeal nerve which is noted posterior to inferior thyroid artery, followed by completion thyroidectomy was done after retention of parathyroid glands (Figure 2c). Total thyroidectomy was done as the right side gland was also enlarged with radiological features of thyroiditis and risk of malignant transformation in later phase was suspected. Hyper vascular gland was noted intra-operatively with profuse bleeding on handling which is feature of graves disease. In view of profuse bleed, huge size gland involving 2lobes with peripheral adhesions total thyroidectomy had been done rather than hemi or subtotal thyroidectomy and we couldn't trace superior laryngeal nerves on both sides due to huge gland size and intraop bleeding. Histopathological examination was reported as Hashimoto's thyroiditis with Graves disease. Immediate post-operative bilateral vocal cord palsy was noted with intermediate position of both vocal cords leading to breathy voice and risk of aspiration. With steroids, speech therapy and conservative management, complete adduction movements of both vocal cords were regained after 1 month with restricted abduction on right side.

Case 3:

A 51 year old male patient came to ENT OPD with complaints of swelling in right submandibular region since 3 years which is gradually increasing in size, not associated with pain. On examination, an oval swelling of 3 × 2 cm firm to hard in consistency, non-tender, non-mobile, bimanually palpable noted in right submandibular region. CECT Neck showed calculus measuring 2.1 × 1.4 cm in deep lobe of right submandibular gland, 8 × 5 mm calculus in superficial lobe. FNAC

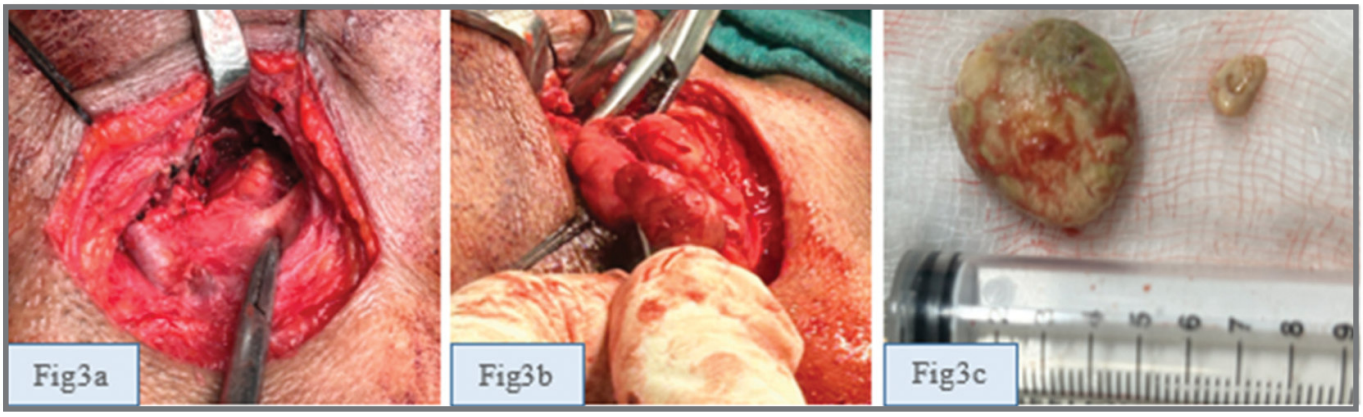

Fig. 3: 3a: Instrument pointing at Lingual nerve 3b: Image showing Right submandibular gland; 3c: Image of calculi after excision

suggestive of sialadenitis. Due to large size of calculi and its site within deep lobe, patient opted for total gland excision rather than retrieval with sialendoscopy after knowing the chances of duct and gland fibrosis and incomplete removal with need of revision surgery with sialendoscopy are high. After preserving the neural structures (Figure 3a), right submandibular gland excision (Figure 3b) with calculi (Figure 3c) was done with intra and postoperative periods uneventful. The marginal mandibular nerve, lingual and hypoglossal nerves are spared with proper ligation of duct.

Case 4:

A 23 year old female patient came with complaints of swelling below the chin since 1 year, gradually increased in size without pain, discharge and no oral discomfort. On examination 4 × 3 cms oval swelling was noted in sub mental region (Figure 4a), not mobile, non-tender, soft, fluctuant and not reducible. Skin pinchability was present with visible pulsations over swelling. USG and CECT (Figure 4b) showed tuft of vessels with vascular malformation mostly AV malformation with vascular supply from bilateral external carotid artery branches and venous drainage into bilateral internal jugular veins. Surgical excision was planned for cosmetic reasons and also to prevent chances of haemorrhage from malformation in future if left untreated. Once subplatysmal flaps were raised mass of vascular tissue noted under and between bilateral anterior belly of digastric muscle (Figure 4c). Feeding vessels clamped and ligated and tuft of vascular tissue removed in total (Figure 4d). As no much important neurovascular structures were noted near submental region the surgery

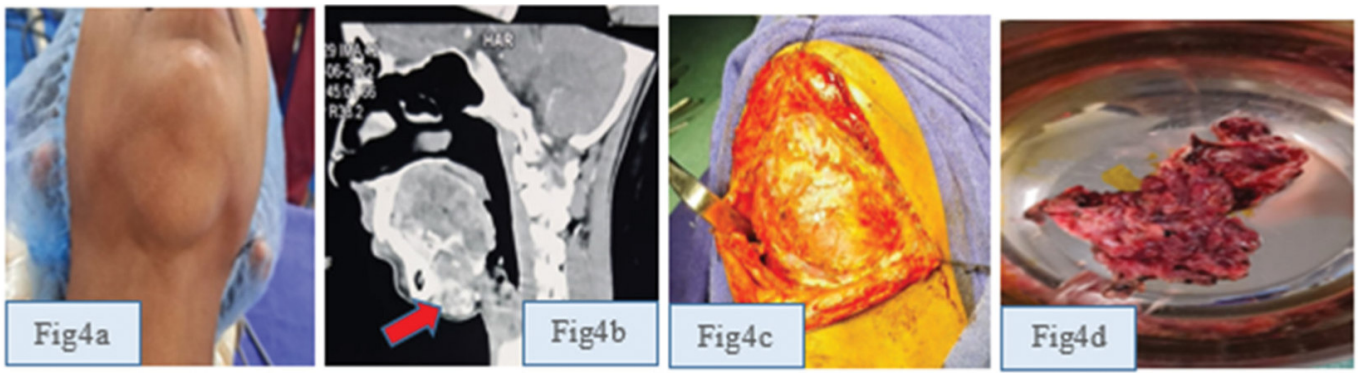

Fig. 4: 4a: Extension of swelling in sub-mental region; 4b: CECT showed tuft of vessels with vascular malformation; 4c: Mass of vascular tissue between bilateral anterior belly of digastric muscle; Figure 4d: Specimen after total excision

was done uneventfully once the feeding vessels got ligated. Histopathological examination showed arterio-venous malformation. 1 year follow-up, no recurrence noted.

Discussion

Swellings in the neck can originate from different structures and can involve different compartments. Here in this series of 4 cases we have seen benign swellings of different origin and aetiology arising from different compartments of neck. A thorough history, examination with couple of investigations were the crucial things for management of neck swellings without complications.

In case 1- Cystic hygroma, the swelling was present in posterolateral part of neck corresponding to posterior triangle. It is a benign congenital malformation of lymphatic tissue usually occurs before 2nd decade of life and rare in adults.[4] Conservative observation, surgery, sclerotherapy, and medical management are different modes of treatment of which surgical excision and sclerotherapy gives better responses.[5] As the patient presented with swelling in this region, after a thorough history and meticulous evaluation, patient was posted for surgery. As the lesion is noted in posterior triangle, need to be careful with important structures like accessory nerve (CN XI), the trunks of the brachial plexus, third part of the subclavian artery etc. We have encountered the spinal accessory nerve during surgery almost adherent to lesion, so dissected carefully and could retain it. Intra and postoperatively the patient did not have any complications.

The 2nd case was huge thyroid swelling with autoimmune thyroiditis .The swelling was noted in central compartment of anterior triangle of neck corresponding to muscular triangle. It was a diffuse swelling with compressive symptoms for patient. With the history suggestive of a swelling with hyperthyroidism initially which reverted to hypothyroidism with drug therapy, the patient was planned for total thyroidectomy after necessary investigations. As the swelling was in muscular triangle of anterior neck the important structures to be secured were recurrent laryngeal nerves [RLN], parathyroid glands etc. Even though careful dissection was done with identification of both RLN and parathyroids the patient had bilateral vocal cord palsy in the immediate postoperative period which recovered with steroids and speech therapy in a month. The RLN is very sensitive and can be harmed by different intraoperative manipulations (i.e., cutting, clamping, stretching, compressing, and heating etc.,**)**.[6] The cause of palsy in our case might be due to compression and ischemia. Postoperative calcium and Paratharmone levels were normal. Other complications like temporary dysphonia occurs in 5-11% of cases and may be permanent in 1 to 3.5% of cases, and temporary hypoparathyroidism occurs in 20 to 30% of cases and may be permanent in 1 to 4% of cases.[7]

The 3rd case discussed was submandibular gland sialolithiasis. Patient had swelling in right submandibular region in anterior neck. As the stone was of size 2cm within deep part of gland and also another small calculi in superficial part, we have planned for total gland excision after discussing with the patient regarding the pros and cons of conservative endoscopic and intra oral manoeuvres. If the stone is deeply seated within the gland, if severely damaged tissue is present, or if recurrent stone formation is a concern, the surgeon can opt to remove the entire affected salivary gland.[8,9,10] The important structures pertaining to this submandibular or digastric triangle are facial artery and vein, lingual nerve, hypoglossal nerve, marginal mandibular nerve. A horizontal incision was made 2 fingerbreadths below the mandible with flap elevation along posterior facial vein was done to retain marginal mandibular nerve. Gland excised intoto after visualising and retaining lingual nerve, hypoglossal nerve and ligating the submandibular duct. Intra and postoperative periods were uneventful. Temporary marginal mandibular nerve (MMN) damage after transcervical submandibular gland surgeries is reported as 36%[11] and the permanent damage as high a rate as 12%[12] in the literature. Among the surgical complications, hypoglossal nerve damage has been reported very rarely (0–1.4%).[13]

The 4th case was submental vascular malformation. Patient came with complaints of swelling in the submental region of anterior triangle of neck. Arteriovenous malformations (AVMs) are vascular malformations that present high-flow direct communication between the arteries and veins, not involving the capillary beds. AVMs represent only 1.5% of all vascular anomalies[14, 15] and

are often identified in the Head and neck region (47.4%) and in the extremities (28.5%).[16] Surgical resection, transcatheter embolization, direct percutaneous embolization/sclerotherapy, laser coagulation, and drugs are usual modes of treatment depending on size and site. We have done surgical excision of tuft of vessels once the feeding vessels were ligated. There are not much important structures in sub mental region so the dissection was done comfortably with only controlling the bleeding. Even though we haven't faced any post op complications, usual Postoperative complications that can be anticipated in this region are submental depression, submental edema, hypertrophic scar formation, scar contracture, cervical necrotizing fasciitis etc

Thus in this series of cases we have encountered swellings in different subdivisions of neck having different important neurovascular structures. With proper evaluation and fine surgical procedures all the cases were properly handled without any permanent postoperative complications.

Conclusion

Herewith we can understand that neck anatomy is very complex. Hence we conclude that proper overall anatomical knowledge, complete analysis of swelling with history, examination and necessary investigations and preoperative planning of surgical steps, fine skilled surgical techniques are utmost important things required to manage a case of neck swelling without severe permanent complications,. We could have got complete orientation of neck if more number of neck swelling cases involving all the compartments of neck have been covered which was the limitation of this series.

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Case Series

Sphenoid Sinus Mucoceles – Our Experience

https://doi.org/10.47210/bjohns.2025.v33i3.240

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ABSTRACT

Introduction

Mucoceles of the sphenoid sinus act as benign lesions and can result in bony erosion from within its continuity of the sinus to the intracranial and orbital spaces. Disease restricted to the sphenoid sinus is rare and often manifests with nonspecific or subtle signs and symptoms. Early and accurate diagnosis of sphenoid sinus disease may thus be difficult. Otolaryngologists must have a thorough knowledge of the spectrum of sphenoid sinus disease and the radiologic characteristics to manage these patients properly. The increased use of endoscopy in routine examination and advances in techniques of imaging this area will result in the more frequent diagnosis of these lesions..

Materials & Methods

Weherewith report 10 cases of chronic rhinosinusitis with sphenoidal mucocele with or without polyposis. All patients underwent detailed history taking, and a thorough examination followed by diagnostic nasal endoscopy and contrast-enhanced computed tomography of the Nose and paranasal sinuses. All patients underwent functional endoscopic sinus surgery, and a swab was sent for KOH stain,and histopathological examination was done for biopsy. With regular follow-upon the 1st month, 6th month, and 12th month, showing no evidence of recurrence to date.

Results

Out of 10 patients four were women and six were men, with a mean age of 40 year and most common presenting symptom being headache followed by nasal obstruction, cacosmia and 8 patients presented with sinonasal polyposis, and two patients without polyposis, 7 patients had diabetes type 2 as a co-morbidity.

Conclusion

Variable nonspecific symptoms and the complex anatomy of the sphenoid sinus tend to delay the diagnosis, resulting in a poor prognosis.

Keywords

Mucocele; Sphenoid; Polyposis

The paranasal sinuses mucoceles are expansive, benign cystic lesions that occur rarely in the sphenoid sinus, lined by pseudostratified epithelium. The sphenoid sinus has been referred to as the neglected sinus because of its isolated position and complexity inaccessibility.[1] Sphenoid sinus mucocele is a rarely afflicted sinus and comprises 1–2% of all paranasal sinus mucoceles.[2] Mucoceles are the most common sequelae following allergic fungal rhinosinusitis.[3] The pathophysiology of this lesion is still uncertain, but it is generally thought to be caused by obstruction of the sinus ostium. Other hypotheses include cystic dilatation of glandular structures and cystic development from embryonic epithelial residues.[4] Patients may present with a myriad of symptoms, due to the presence of important contiguous neurological and vascular structures.[5] They may also be asymptomatic.[6] Sphenoid or posterior ethmoid mucoceles produce more subtle symptoms, including visual disturbance, generalized headache, diplopia, and orbital displacement.[7,8] Radiological imaging techniques and the use of endoscopes have assisted in the diagnosis of a sphenoid sinus mucocele. The treatment of choice is endoscopic sphenoidotomy and drainage of the mucocele.[4,9]

Thus, a thorough preoperative workup, endoscopic

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evaluation, and imaging techniques allow safe management of this type of lesion 10.

Materials and Methods

This is a case series of about 10 patients who presented with various symptoms suggestive of sphenoid sinus mucoceles who were evaluated and managed surgically at the department of Otorhinolaryngology and head and neck surgery, at a tertiary care. This study was conducted over two years from September 2020 to August 2022.

All the patients included in our study were subjected to a detailed history taking regarding the presenting complaints and other co-morbidities. This was followed up by a thorough ear, nose, throat, head, and neck examination, which was also followed by a thorough systemic examination. Patients were then subjected to a diagnostic nasal endoscopy, and swabs were collected for KOH mount, gram staining, and culture and sensitivity whenever it was required. These patients then underwent radiological evaluation with Non-contrast Computed tomography of the nose and paranasal sinus, diagnosis of sphenoid mucocele was confirmed, and any other co-existing pathology was also looked for. These patients then underwent routine pre-operative investigations, pre-anaesthetic evaluations, and ophthalmological evaluation. All the patients then underwent functional endoscopic sinus surgery with sphenoidotomy under general anaesthesia; sufficient removal of the anterior and inferior walls of the sphenoid sinuses was made to allow adequate drainage into the sphenoethmoidal recess and to avoid recurrence, any other co-existing nasal pathologies were also tackled at the same sitting.Specimens of the polyp were sent for histopathological evaluation, and fungal debris and pus collected were sent for KOH mount, gram staining, and culture & sensitivity. All the patients tolerated the procedure well with no complications. The post-operative period of all the patients was uneventful. Anterior nasal packing was removed on the 2nd post-operative day, and patients were discharged. Postoperative treatment consisted of nasal lavage and the use of a topical corticosteroid spray (in each nostril bid) for 1 month. At the time of first postoperative consultation, a clinical and endoscopic examination was done to remove secretions, crusting, or synechiae. Patients were asked to come for routine follow-ups, for 1 year 1st month, the 6th month, and at the 12th month to look for recurrence.

Case Series

Case 1:
A 60-year-old male patient presented with a headache for 6 months, with recent onset of nasal discharge, and with type 2 diabetes mellitus as a co-morbidity. Ondiagnostic nasal endoscopy,there was mucopurulent non-fowl smelling discharge from the sphenoethmoidal recess, and multiple polypoidal masses were noted.And on computed tomography of the nose and paranasal sinuses, showed sphenoid mucocele with sphenoid sinusitis underwent functional endoscopic sinus surgery, on regular follow up no evidence of recurrence.

Case 2:
A 41-year-oldf emale patient presented with a headache for 2 months, with decreased smell sensation and no morbidities. On diagnostic nasal endoscopy,there was mucopurulent non-foul-smelling discharge from the spheno-ethmoidal recess and mucopurulent discharge from the middle meatus.Multiple polypoidal masses were notedand on computed tomography of the nose and paranasal sinuses, showed sphenoid mucocele with pansinusitis was noted. Underwent functional endoscopic sinus surgery. On regular follow up no evidence of recurrence.

Case 3:
A 55-year-old male patient was referred by a physician on an incidental finding in computed tomography of the brain,which was done for giddiness and with type 2 diabetes mellitus as a co-morbidity. On diagnostic nasal endoscopy, there was no evidence of discharge or mass, and he underwent functional endoscopic sinus surgery; the procedure surgery uneventful.

Case 4:
A 35-year-old female patient presented with nasal obstruction for 10 months with occasional headache and with type 2 diabetes mellitus as co co-morbidity.On diagnostic nasal endoscopy, there was mucopurulent,foul-smelling discharge from the sphenoethmoidal recess, and on computed tomography of the nose and paranasal sinuses, showed sphenoid mucocele with pan sinusitis underwent functional endoscopic sinus surgery, and on regular follow with no fresh complaints.

Case 5:
A 28 year female patient presented with headache for 5 months with orbital pain, on diagnostic nasal endoscopy there was mucopurulent fowl smelling discharge from sphenoethmoidal recess and middle meatus with multiple polypoidal mass noted andoncomputed tomography of nose and paranasal sinusesshowed sphenoid mucocele pushing orbit with sinusitis underwent functional endoscopic sinus surgery, on regular follow up and post surgery uneventful.

Case 6:
A 42-year-old male patient presented with cacosmia for 1 year with headache and with type 2 diabetes mellitus as a co-morbidity. On diagnostic nasal endoscopy, there was mucoidnon-foul-smelling discharge from the sphenoethmoidal recess with multiple polypoidal masses noted, and on computed tomography of nose and paranasal sinuses, showed sphenoid mucocele with sinusitis underwent functional endoscopic sinus surgery, and on regular follow up no evidence of recurrence.

Case 7:
A 39-year-old male patient presented with excessive sneezing for 6 months with headache and with type 2 diabetes mellitus as co co-morbidity. On diagnostic nasal endoscopy, there was mucopurulent,foul-smelling discharge from the sphenoethmoidal recess, multiple polypoidal masses werenoted, andcomputed tomography of the nose and paranasal sinusesshowed sphenoid mucocele.

With sinusitis underwent functional endoscopic sinus surgery he is on regular follow-up.

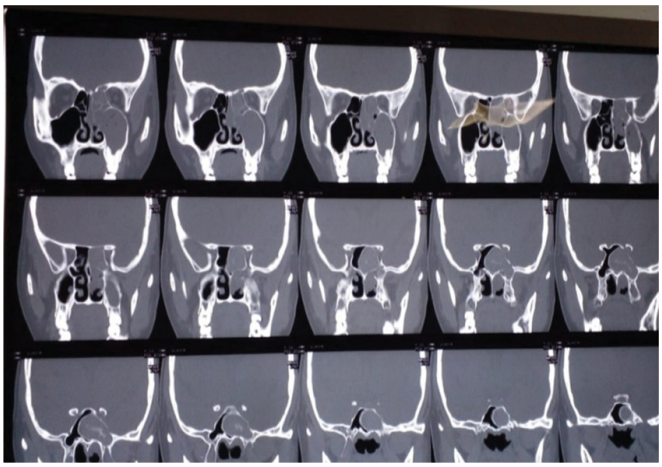

Fig. 1. Left pan sinusitis with? Left sphenoidal mucocele showing heterogeneous density within it

Case 8:
A 56-year-old male patient presented with headache for 2years with nasal obstruction, and with type 2 diabetes mellitus as a co-morbidity. On diagnostic nasal endoscopy, there was mucopurulent non-fowl smelling discharge from the sphenoethmoidal recess, with a polypoidal mass noted, and

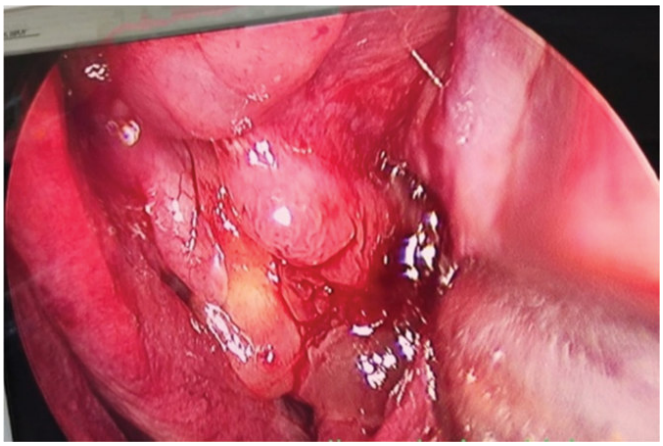

Fig. 2. Multiple pale polyps filling the left nasal cavity arising lateral to the middle turbinate

Oncomputed tomography of the nose and paranasal sinuses,showed sphenoid mucocele was shown with sinusitis that underwent functional endoscopic sinus surgery, and on regular follow up no evidence of recurrence.

Case 9:
A 43-year-old female patient presented with sneezing for 1 month with nasal obstruction, and with type 2 diabetes mellitus as a co-morbidity.On diagnostic nasal endoscopy, there was mucoidnon-foul-smelling discharge from the sphenoethmoidal recess with multiple polypoidal massesnoted, and on computed tomography of nose and paranasal sinuses, showed sphenoid mucocele with sinusitis underwent functional endoscopic sinus surgery, post-surgery surgery uneventful.

Case 10:
A 30-year-old male patient presented with headache for 3 months with cacosmia, and with type 2 diabetes mellitus as a co-morbidity. On diagnostic nasal endoscopy, there was mucopurulent non-foul-smelling discharge from the sphenoethmoidal recess with multiple polypoidal masses noted,and on computed tomography of the nose and paranasal sinuses, showed sphenoid mucocele with sinusitis underwent functional endoscopic sinus surgery, and on regular follow up no evidence of recurrence**.**

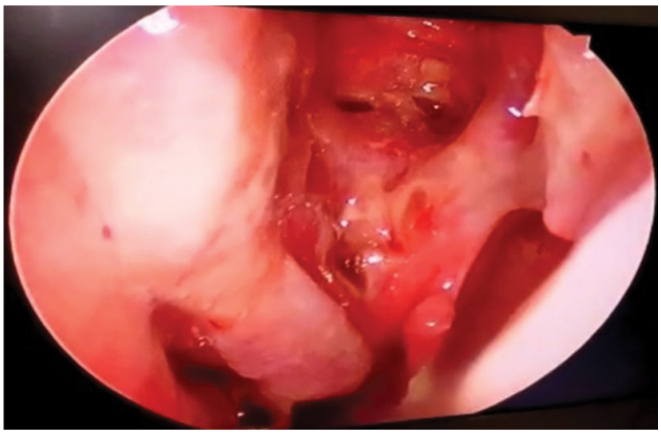

Fig. 3. Post operative picture of maxillary ostium

Results

The 10 patients included in the study comprised four women and six men, with a mean age of 40 years (range 21–60 years) (Figure 4).

The common presenting symptoms of the patients were headache, nasal obstruction, cacosmia, nasal discharge, excessive sneezing, and diplopia,which are shown in Figure 5.

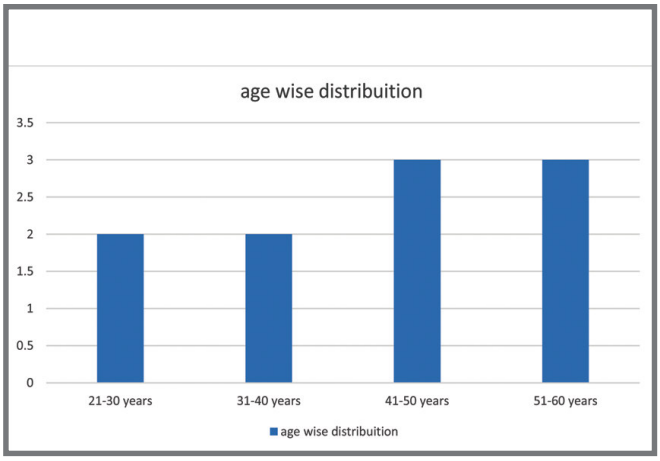

Fig. 4. Distribution according to age

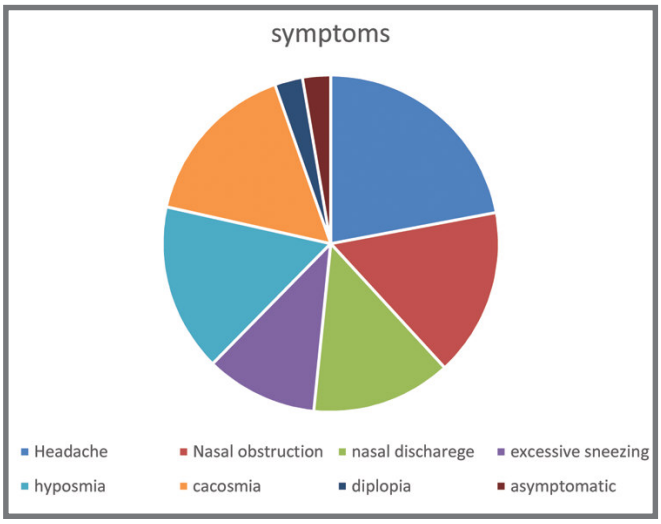

Fig. 5. Distribution according to symptoms

With head headache being the most common presenting complaint. One of the patients was asymptomatic and was diagnosed incidentally. Most of the patients came out to have fungal elements in the KOH mount sent intra-operatively from the fungal debris collected from the sphenoid sinus, which is about 70% (7 out of 10 patients), as shown in Figure 6.

Out of 10 patients, 8 patients presented with sinonasal polyposis, and two patients without polyposis (Figure 7).

Also, 7 patients had diabetes type 2 as a co-morbidity (Figure 8).

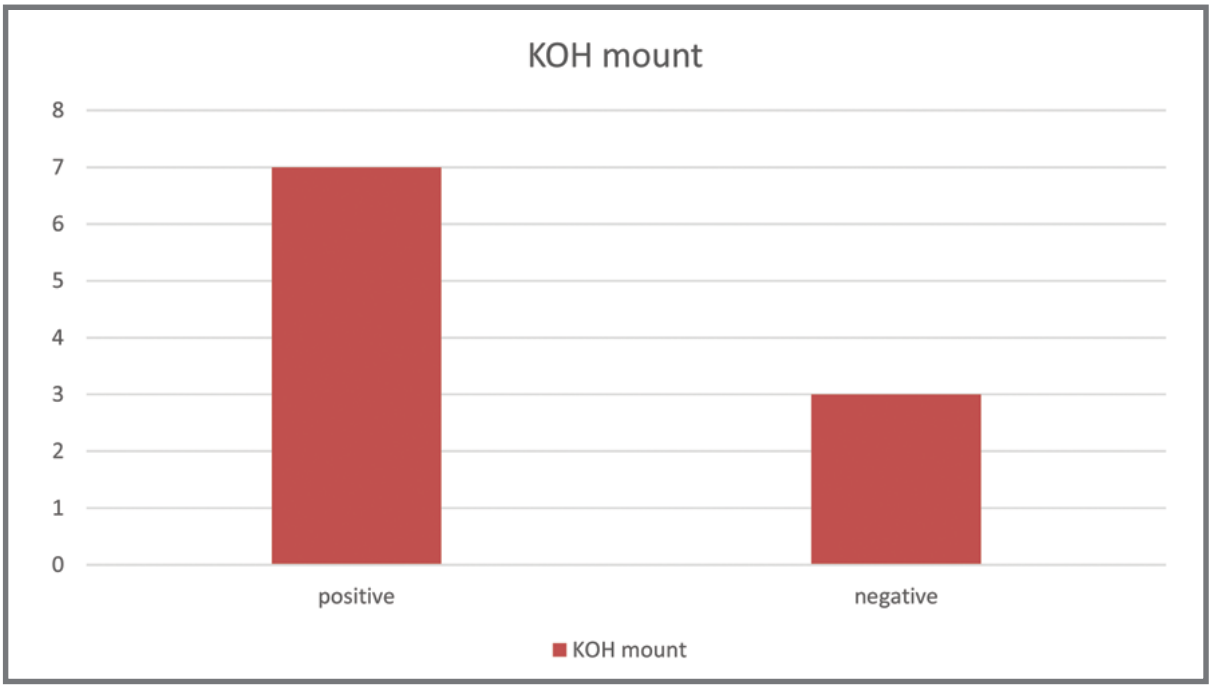

Fig. 6. Distribution according to presence of fungal elements in KOH mount

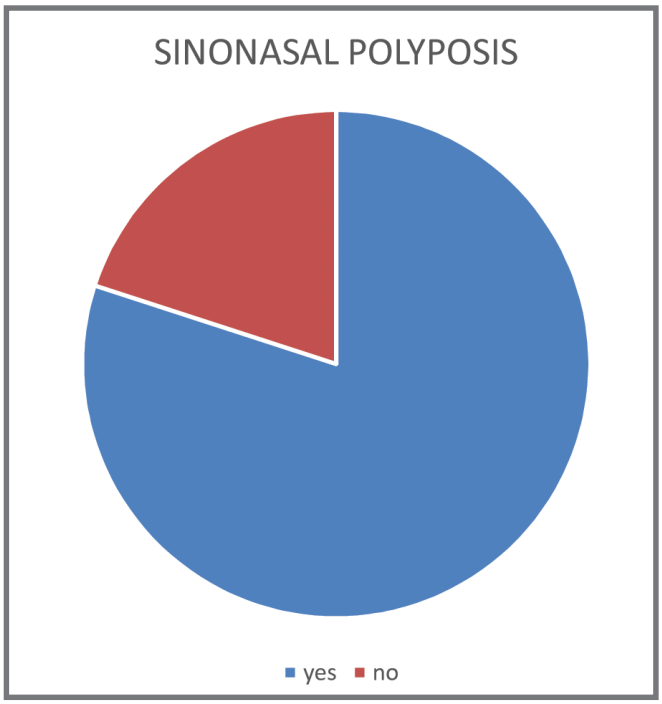

Fig. 7. Distribution according to presence of sinonasal polyposis

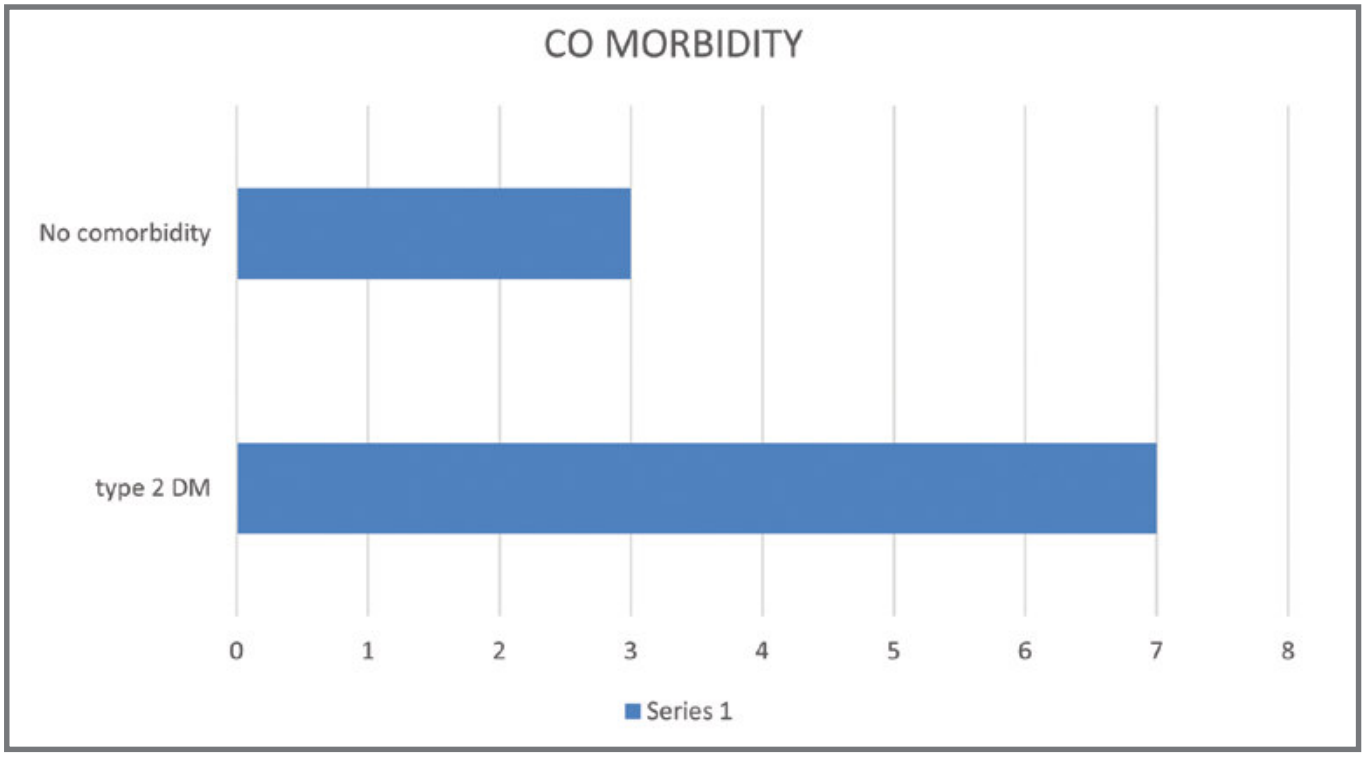

Fig. 8. Distribution according to co-morbility

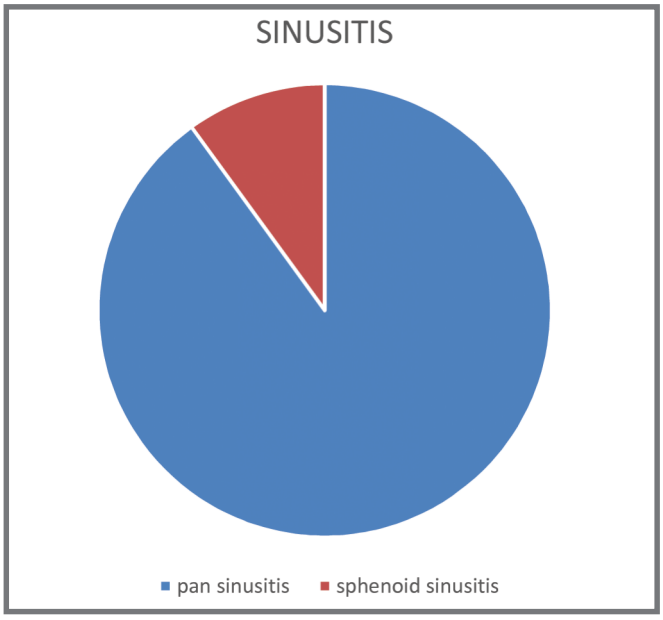

Fig. 9. Distribution according to involment of sinuses

Among these 9 patients had pan sinusitis, and 1 patient had only sphenoid sinusitis with mucocele.

Discussion

Sphenoid sinus mucocele is a rare entity, representing only 1-2% of all paranasal sinus mucoceles. It can present in any age group, but 30 to 60 years are more commonly affected, with no gender predilection. In our study, the patients inthe age group 20-60 were affected by sphenoid mucocele, with the lowest age being 23 years and the highest age being 59 years. There is no sex preponderance observed in sphenoid mucoceles.In our study, it was observed more among males (06) when compared to females (04), but we will need a study with a larger sample size to deduce more regarding any sex preponderance.

The most common presenting complaints in sphenoid sinus disease are vague facial pain or headache, with associated symptoms being nasal obstruction, smell, and

visual disturbances. In our study, the commonest presenting complaint was headache, which was a generalized type observed in about 80% of patients, followed by nasal obstruction. One of our patients was asymptomatic, came for otological complaints, and was incidentally diagnosed with sphenoid mucocele when computed tomography of the nose and paranasal sinuses was done to rule out nasal pathologies. Diplopia was observed in one of the patients who had bone thinning on the medial wall of the orbit with pressure over the medial rectus muscle; the symptoms subsided post-operatively. A mandatory nasal endoscopy enables collection of cultural material, determining extension to the nasal cavity, and identifying nasal anatomical configuration relevant to surgery. [1, 2]

Sino-nasal computed tomography usually demonstrates mucoceles as being hypodense with a characteristic expanding propensity, unlike simple fluid retention. Surgical evacuation of the lesion for symptomatic relief and prevention of recurrence has been advocated. Early treatment confers the benefit of preventing visual damage and neurological deficits. Various approaches to the sphenoid sinus include trans-nasal, transseptal, and trans-ethmoid approaches. The endonasal endoscopic approach via the transnasal route is the current treatment modality of choice.[2,11]

Endoscopic trans-nasal sphenoidotomy with adequate removal of anterior and inferior sinus walls enables unimpeded sinus drainage into the spheno-ethmoid recess and prevents recurrence.[3]

A long-term post-operative follow-up regime is recommended due to the possible recurrence even 2 decades after theinitial surgery. Certain tumors and tumor-like conditions like carcinoma, fibrous dysplasia, osteoma, and ossifying fibroma are likely to be found as concomitant lesions with sphenoid mucocele, thus mandating its systematic evaluation and management.[3,10]

Most of our patients were diagnosed early, evaluated, and treated by surgical intervention, which is the treatment of choice in cases of Paranasal sinus mucoceles. This prevents the extension of the mucocele, causing various visual and neurological complications. Though this is a rare entity, it is better to thoroughly evaluate the patient clinically and radiologically to obtain an early diagnosis and effective management of this condition to prevent any complications and recurrence of the disease.

In our study, most patients had a history of rhinosinusitis, which is almost similar to a study conducted by Soon s r, the same study showed a history of nasopharyngeal carcinoma treated with radiotherapy asthe most common aetiological factor, followed by chronic sinusitis.

Sphenoid sinus mucocele is a rare condition; radiation to the head and neck appeared to be a predisposing factor, and eye symptoms were the commonest presentation. Endoscopic sinus surgery is a safe and effective treatment modality.[12]

Conclusion

Surgical treatment is indicated in the case of sphenoid mucocele, and early treatment avoids visual damage that can be permanent. Endonasal endoscopic approach with drainage and marsupialization of the sphenoid sinus along with ethmoidal polyposis using a transnasal corridor is a safe and effective treatment modality for less recurrence.

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Case Report

From Crisis to Control: Successful Management of Cricotracheal Separation

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ABSTRACT

Introduction

Cutthroat injuries causing trauma to the laryngeal framework are one of the most challenging airway emergencies managed by otorhinolaryngologists, and a complete cricotracheal separation is the most severe type of laryngeal injuries. Prioritizing emergency airway establishment is the most crucial in the management of this scenario and a preliminary tracheostomy is the preferred, rather than intubation which may actually worsen the situation. The management should also include neck exploration and securing the laryngeal continuity will ensure a good quality of voice as well as life. Here, we report a case of cricotracheal separation that was managed successfully in our hospital underscoring the critical role of timely intervention and meticulous surgical techniques in achieving favorable outcomes in cutthroat injuries and the literature review of the same.

Case Report

We report the case of a 34-year-old male with a self-inflicted cutthroat injury resulting in a partial cricotracheal separation. On arrival, the patient was conscious, with stable vital signs but aphonic, and had a deep neck wound exposing the trachea. Emergency tracheostomy was performed through the distal end of the transected trachea, followed by neck exploration and primary repair of the cricotracheal junction using interrupted 3-0 polygalactin sutures. Comminuted thyroid and cricoid cartilage fractures were reconstructed, and postoperative care included antibiotics, corticosteroids, and enteral feeding via Ryle's tube. The patient was successfully decannulated on postoperative day 9. At 10 months of follow-up, the patient demonstrated normal voice quality, fully mobile vocal cords, no evidence of airway stenosis, and no requirement for further airway support. Psychiatric evaluation led to initiation of treatment for depression, and the patient remains stable both physically and mentally.

Discussion

Cricotracheal separation is a rare but critical component of cutthroat injuries. Immediate airway control, appropriate surgical repair, and multidisciplinary care are crucial for favourable outcomes. Our case highlights the potential for full functional recovery with timely intervention, even in resource-constrained settings.

Keywords

Cut Throat Injury; Laryngeal Framework Injuries; Cricotracheal Separation; Laryngeal Repair

Cutthroat injuries worldwide account for 5 to 10% of all traumatic injuries.[1] These injuries can involve the soft tissue of the neck, great vessels, and the nerves in the neck, laryngeal framework, esophagus, and cervical vertebrae.[2] Managing cutthroat injuries requires a multidisciplinary team capable of stabilizing the patient's condition before definitive management is planned.[3] Laryngeal framework injuries are to be addressed as emergency because they involve the airway and have long-term effects on voice and quality of life as well. According to the Schaefer-Fuhrman classification of laryngeal trauma, the most severe type is the complete cricotracheal separation, which poses an imminent danger of loss of airway.[4] These injuries must be promptly and appropriately managed, necessitating a well-trained otolaryngologist and a multidisciplinary team for the best outcome.

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We are presenting a case report of partial cricotracheal separation that was successfully managed in our institute and the literature review of the same.

Case Report

A 34-year-old male patient was brought to the emergency room by his colleague after finding the patient covered in blood, lying next to a kitchen knife with an open neck injury that was actively bleeding.

Upon initial assessment, the patient was conscious with a Glasgow Coma Scale score of E4V1M5, and his vitals were stable. However, the open neck injury revealed a partially exposed trachea, prompting an immediate call to the ENT duty team for emergency airway management.

The patient did not present with stridor and was unable to phonate. Upon inspection of the neck, there were three cut injuries involving Roon and Christensen's Zone 2. The upper two cut injuries measured about 5 x 2 x 1 cm and involved the anterolateral aspect of the neck. We observed a single cut injury measuring 10 x 2 x 4 cm over the middle part of the neck, extending from the posterior border of the right sternocleidomastoid to the anterior border of the left sternocleidomastoid, at the level of the thyroid cartilage. Upon reflecting the skin flap, a partially transected trachea at the level of cricoid cartilage and the 1st tracheal ring with an intact posterior tracheal wall was exposed (Fig.1).

We also noted that there were no injuries to the major neck vessels; however, there were multiple soft tissue injuries with excessive bleeding. No delay was made for radiological assessment as the severity of the injury and the need for immediate airway management were obvious.

The patient was immediately shifted to the operating room and a 8 Fr cuffed tracheostomy tube was inserted into the distal end of the transected trachea and secured with the lower skin flap. Emergency neck exploration was done under general anesthesia administered through the tracheostomy tube. A distal tracheostomy was created, and an 8 Fr cuffed tracheostomy tube was inserted at

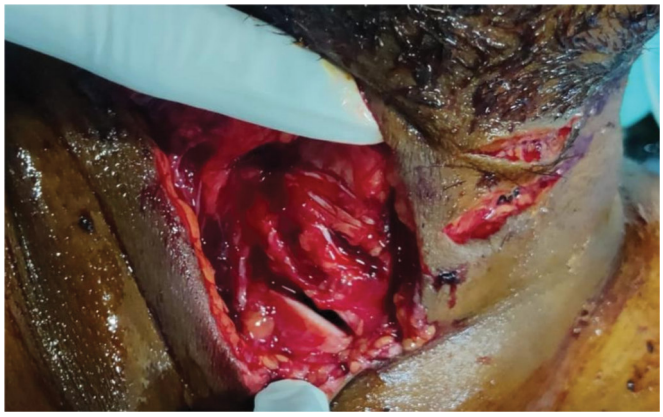

Fig. 1. Lacerated wound exposing cricotracheal separation with tentative cuts in the anterolateral aspect of the neck

the 2nd tracheal ring. The initial tracheostomy tube was removed, and cricotracheal repair was performed by interrupted sutures using 3-0 polygalactin, with an end-to-end anastomosis without including the endoluminal mucosa and we avoided unnecessary lateral exploration to prevent recurrent laryngeal nerve injury.

There were multiple comminuted fractures of the thyroid and cricoid cartilage with intact inner perichondrium, which were repaired with 3-0 polygalactin on the atraumatic needle by interrupted sutures over the outer perichondrium (Fig.2).

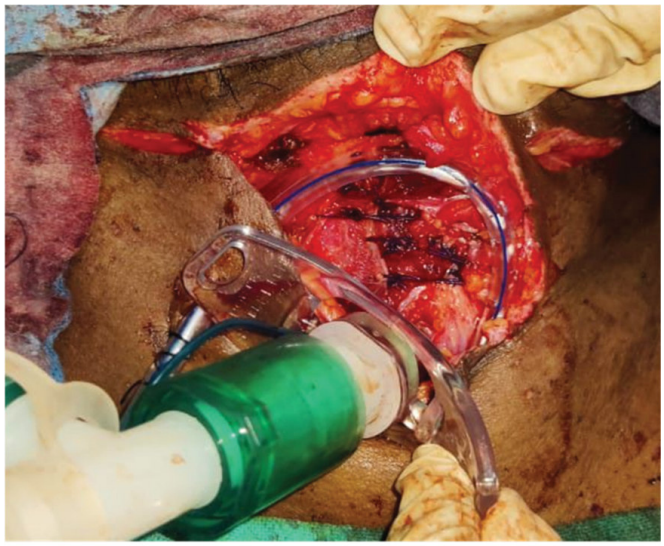

Fig. 2. Anastomosis and repair of laryngeal framework with distal tracheostomy in situ

Tracheal continuity was ensured, and the soft tissue was closed in layers using 3-0 polygalactin on the atraumatic needle and 3-0 nylon. A 14 Fr size suction drain was placed in the subplatysmal plane.

The vocal cords were examined using video laryngoscopy, revealing bilateral oedematous vocal cords; however, the mobility could not be assessed. A Ryle's tube was inserted to ensure postoperative nutritional care.

Postoperatively, the patient was treated with parenteral antibiotics, intravenous dexamethasone, Ryle's tube feeds, regular tracheostomy tube care, and neck wound dressings. The Ryles tube was removed on the 5th postoperative day, and the patient could tolerate a soft solid diet.

A non-contrast computed tomography neck was performed on the 6th postoperative day, revealing subcutaneous emphysematous air pockets in the deep subcutaneous plane and right visceral space involving the right cricothyroid muscle. There were no endo-laryngeal injuries. Tracheostomy downgrading was gradually initiated, and the patient was decannulated on the 9th postoperative day.

Psychiatric consultation was sought for the cause of his suicidal tendencies and depressive symptoms for which the patient was started on antipsychotics, antidepressants, and psychotherapy. He was discharged on the 10th postoperative day in stable physical and mental condition.

After 10 months of postoperative follow-up, the patient remains stable physically and mentally, with a normal voice, and can perform regular activities and strenuous physical work comfortably. Follow-up video laryngoscopy showed normal and equally mobile vocal cords, with no subglottic stenosis (Fig.3).

X-ray of the soft tissue neck showed a normal airway and no airway narrowing (Fig.4).

Fig. 3. 10 months follow-up videolaryngoscopy showing normal-looking vocal cords with no post-traumatic sequelae

Fig. 4. 10 months follow-up x-ray showing no airway narrowing.

Discussion

Laryngeal traumas are very rare, amounting to less than 1% of all trauma cases[5] and can result from blunt or penetrating trauma to the neck. Penetrating neck injuries commonly occur due to road traffic accidents, homicides, suicides, bull gore incidents, and gunshot wounds. Cut-

throat injuries are a known method of homicide and are observed in suicides as well, as in our case. In South India, the majority of patients with such injuries are male, from rural populations, and fall within the age bracket of 20 to 40 years.[3, 6]

Our patient was brought to the emergency department and had multiple self-inflicted cuts in the neck, causing soft tissue injuries at the level of the thyroid cartilage and an open airway exposing the cricotracheal separation. Psychiatry consultation revealed an underlying depressive cause for his suicide attempt, resulting in cutthroat injury.

Neck injuries are classified into three anatomical zones according to Roon and Christensen's classification, with zone II injuries being predominant. This is due to the lack of protection by bony structures, making it highly vulnerable, especially in cut-throat injuries, as in our case.

In a retrospective study conducted by Panchappa et al. in South India, 51 cases of cutthroat injuries were analysed. Among these cases, 12 had laryngeal injuries, and only 1 patient sustained a tracheal injury, highlighting the rarity of isolated tracheal injuries.[6]

In an effort to investigate the outcomes of neck injuries, a case series by Chakraborty et al. from West Bengal described 22 patients with cutthroat injuries. Among them, 3 out of 22 patients required permanent tracheostomy, 4 experienced permanent voice changes, 2 developed laryngeal stenosis, and 1 developed tracheal stenosis.[7]

The literature recommends that neck imaging should be performed only after stabilizing the airway, and computed tomography of the neck is particularly helpful in cases where the continuity of the larynx and trachea cannot be assessed due to extensive neck edema or hematoma formation.[8] In our case, we did not have time for radiological investigation, and a partial cricotracheal separation was evident.

The recommended management approach for laryngeal framework injuries, especially cricotracheal separation, involves emergency tracheostomy followed by neck exploration and prompt repair, preferably with interrupted absorbable 3-0 sutures, which have the lowest chance of granuloma formation. [2, 7, 9, 10] We followed this approach, achieved a successful anastomotic outcome, and restored laryngeal function without secondary healing sequelae, which are the ultimate goals of emergency surgical management. Early decannulation, if vocal cords are mobile, and regular follow-up of the patient, will ensure that postoperative healing sequelae are minimized.[11]

The long-term sequelae that can cause significant morbidity in such cases include recurrent wound infection, granuloma formation, poor voice quality, tracheal stenosis, chronic aspiration, and the need for permanent tracheostomy.[5, 7] However, none of these were observed in our patient during the 10-month follow-up.

The following measures contributed to our effective management of the airway in an emergency, resulting in a favorable anastomotic and functional outcome:

1. Time management - There was no delay in triage and promptly shifting the patient to the operating room.
2. Airway management - Immediate control of the airway was achieved by cannulating the distal trachea.
3. Correct surgical technique - Utilization of a distal tracheostomy approach, repair of the anterior and lateral tracheal wall through careful end-to-end anastomosis while excluding the mucosa from sutures, and avoidance of unnecessary lateral exploration to prevent recurrent laryngeal nerve injury.
4. Good post-operative care - Early decannulation of the tracheostomy was implemented.

Conclusion

Cutthroat injuries represent critical surgical emergencies, demanding the expertise of a multidisciplinary team for successful management. Laryngeal framework injuries should be handled by an otorhinolaryngologist for immediate airway management and to ensure laryngeal continuity for good clinical outcomes.

Our experience underscores the importance of swift and precise intervention in addressing cutthroat injuries. Despite their severity, our case demonstrates that with prompt airway management and careful repair techniques, favourable outcomes are attainable, even in resource-limited settings.

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Riedel's Thyroiditis: A Rare Clinical Entity

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ABSTRACT

Introduction

Riedel's thyroiditis is a chronic inflammatory disease of the thyroid gland characterized by fibrotic infiltration which leads to its parenchyma being replaced by fibrous tissue rendering the gland nonfunctional. The exact etiology is unknown, but currently, the most accepted view is that of systemic autoimmune hypothesis. Due to its low incidence and it resembling other more common thyroid pathologies there is often a delay in diagnosis. Due to the paucity of literature on the disease as it is a rare entity this report presents an insight on the diagnostic dilemma posed by Riedel's Thyroiditis and the possible means for the management of the disease.

Case Report

45-year male presented with complaints of an anterior neck swelling for the last 20 years with a discharging opening in the neck following decannulation of a tracheostomy and also with difficulty breathing on lying down for the last 14 days. The patient was investigated and diagnosed as a benign thyroid swelling with a sinus tract and taken up for hemithyroidectomy. Ultimately was diagnosed as a case of Riedel's Thyroiditis. The patient has been in regular follow up and is doing well.

Discussion

Clinical knowledge of such a presentation of Riedel's thyroiditis would enhance our ability to make an accurate diagnosis. We report a case of a male patient with Riedel's thyroiditis keeping in mind its rare occurrence and highlighting the diagnostic challenges.

Keywords

Riedel's Rhyroiditis; Hemithyroidectomy; Thyroid Fistula; Euthyroid

Riedel's thyroiditis was first described in 1896 by Reidel. It is a rare disease with a low incidence of 1.06 cases per 100,000 outpatients and accounting for 0.06% of all thyroidectomies.[1] It is a chronic inflammatory disease characterized by invasive fibrosis that partially destroys the thyroid gland and extends into adjacent neck structures.[2,3] Thyroid gland is non tender with a stony hard consistency as a result of fibrosis. The literature is often limited to case reports and small case series.

Riedel's thyroiditis presents a clinical challenge since it can mimic the fibrous variant of Hashimoto thyroiditis or malignant neoplasm during preoperative clincoradiological examination. Also, diagnosis can only be confirmed with an open biopsy of the thyroid gland highlighting the fact that there are no non-invasive or minimally invasive tests or criteria to establish the diagnosis.

Case Report

A 45-year-old male presented to the outpatient department at our institute with an anterior neck swelling for 20 years which was insidious in onset and gradually progressive. It was associated with shortness of breath on lying down since the last 15 days. Patient had a past history of a road traffic accident 8 months ago following which he was tracheostomised in view of prolonged intubation due to diffuse axonal injury by the department of Neurosurgery at our hospital. Three weeks after decanulation he developed a persistent opening in front of neck which was associated with purulent discharge since 6 months.

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On clinical examination of the swelling, it was approximately 10 x 7 cm in size mainly on the right side of neck with retrosternal extension, which was firm and non-tender. It was mobile as it moved with deglutition but not with protrusion of tongue. A fistulous opening of size 1 x 1cm close to midline was present through which pus could be expressed, with normal surrounding skin (Fig.1).

A thyroid function test was done which showed the patient to be euthyroid: T3 of 0.67 ng/ml (0.97-1.69 ng/ml), T4 of 4.6 mcg/dl (5.53-11.0 mcg/dl) and TSH of 3.84 mIU/L (0.46-4.68 mIU/L). AntiTPO was <28IU/ml(0-34IU/ml) and thyroglobulin levels of 1.4ng/ml(1.4-29.2ng/ml)

Fig. 1: Right sided neck swelling with a fistulous opening

Imaging modalities like ultrasonography (USG), X-ray soft tissue neck (STN) and Contrast enhanced computed tomography (CECT) Neck were performed. USG Neck showed 4 x 5.6 x 7 cm (85 cc vol) sized abscess in the right lobe of the thyroid with a separate TIRADS V lesion measuring 4.7 x 3.7 x 3.8 cm which was solid, hyperechoic, wider than taller, showing punctate and peripheral rim calcifications with extrathyroid extension (Fig.2). It also showed deviation of trachea towards the left. A fistula tract of 2.8 cm long and 4.6 mm thick with its external opening near midline and internal opening communicating with the right thyroid lesion, was also noted (Fig 3 & 4).

CECT Neck revealed multiple heterogeneously enhancing hypodense nodules seen in right lobe of thyroid showing multiple coarse calcification and air foci with extension into anterosuperior mediastinum, largest measuring 5.6 x 6.4 cm with compression and displacement of trachea towards the left side, suggestive of a Colloid nodule or Follicular adenoma.

X-ray STN anteroposterior and lateral view showed gross displacement of the trachea to the left with a soft tissue opacity on the right side with areas of coarse calcification, anterior to the airway at level C4-C6 with a normal prevertebral space and normal vertebrae (Fig 5 & 6).

Fig. 2. TIRADS V lesion in right thyroid lobe with internal areas of calcification

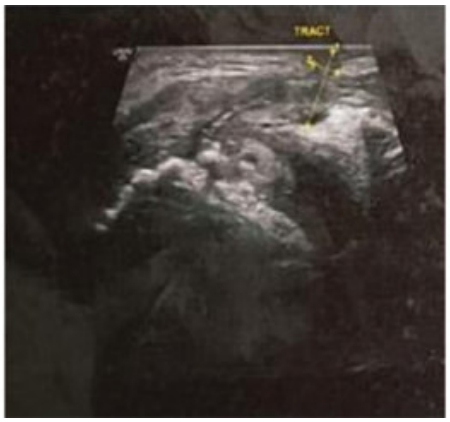

Fig. 3. External opening of the fistulous tract

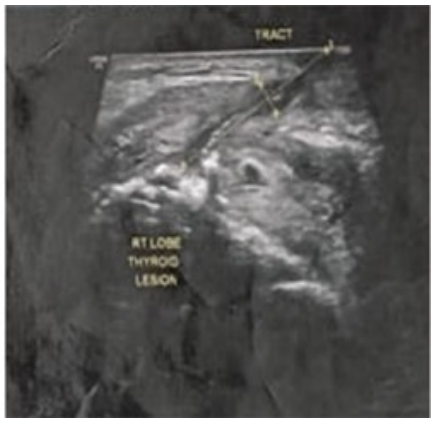

Fig. 4. Internal opening of the fistulous tract into the right lobe of thyroid

Fig. 5. X-ray STN anteroposterior view showing tracheal deviation

Fig. 6. X-ray STN lateral view showing coarse calcifications

USG guided FNAC showed small group of slightly scattered benign follicular cells in a background of blood and colloid, suggestive of benign follicular nodular disease (Bethesda Category II) in the right lobe and pus aspirated from a swelling near the fistula, consisting of dense acute and chronic inflammation in a background of blood, suggestive of a non-specific abscess.

The patient was subsequently planned for right hemithyroidectomy under general anaesthesia after due considerations and pre anaesthetic checkup. Due to extensive tracheal deviation the patient was intubated via fibreoptic approach.

Horizontal skin crease incision was given with an elliptical encirclement of the fistulous opening. Intraoperatively the right lobe of thyroid was found to be stony hard with area of surrounding fibrosis. The sternothyroid muscle was found adherent to the gland and was partially removed. The right lobe of thyroid was

Fig. 7. 9 x 6 cm Rt Lobe of thyroid with isthmus and adherent sternothyroid muscle

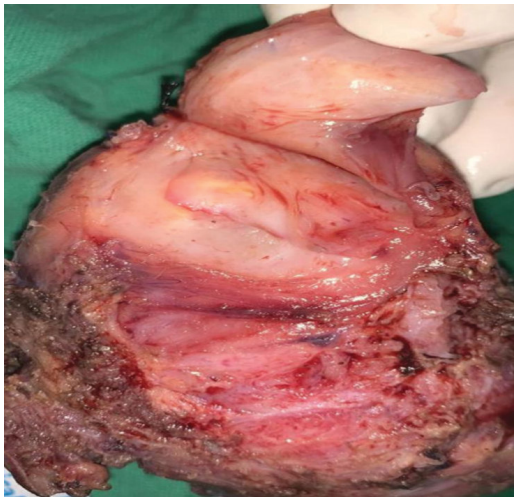

Fig. 8. Thyroid was stony hard in consistency and cut surface showed calcification

delivered in toto along with the isthmus and the cutaneous opening of the sinus tract (Fig. 7 & 8) and sent for histopathological examination.

Histopathological examination on gross showed the whole parenchyma replaced with solid cystic tumor with necrotic material and calcifications. Small portion of normal thyroid tissue seen at lower pole. Cut surface gritty due to calcification. Microscopy revealed thyroid tissue being almost replaced by extensive fibrosis and sclerosis (fig.9) with dense infiltration by lymphocytes (fig.10), plasma cells and histiocytes hemosiderin laden macrophages were present, areas of acute inflammatory cell infiltrate with abscess formation and necrosis were noted along with few areas of calcification and foreign

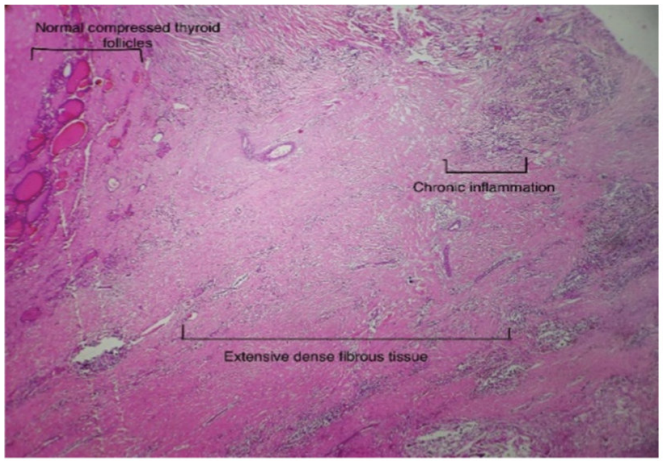

Fig. 9. 4x magnification with H and E staining showing extensive fibrous tissue and thyroid follicles pushed

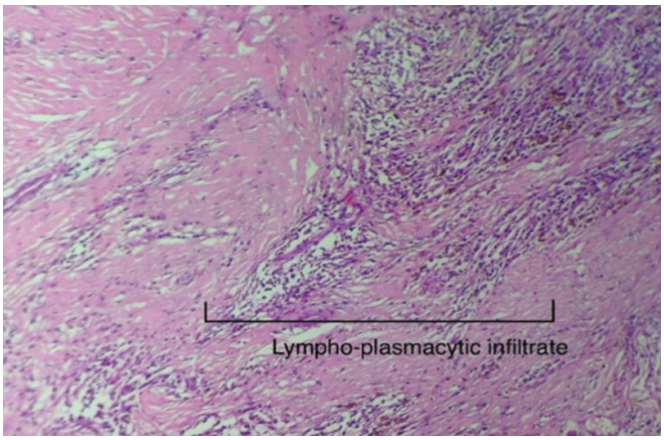

Fig. 10. 10x magnification with H and E staining showing Lympho-plasmacytic infiltrate

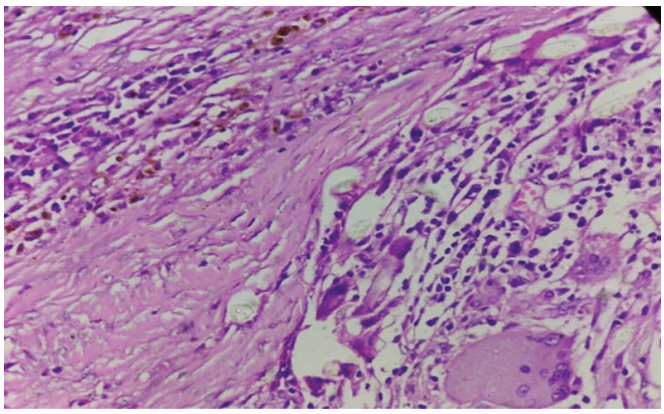

Fig. 11. 40x magnification with H and E staining showing Hemosidern laden macrophages and foreign body giant cells

body giant cells (fig.11). The final pathological diagnosis of Riedel's thyroiditis was made on the basis of histopathological findings.

Patient is in regular follow-up with no signs of recurrence and is doing well.

Discussion

Riedel's thyroiditis is extremely rare. It is a rare inflammatory process of the thyroid gland and surrounding structures.[2] It is usually associated with extensive fibrosis, replacing the normal thyroid tissue leading to hypo functionality of the gland. It has a low incidence of 1.06 cases per 100,000 outpatients accounting for 0.06 % of all thyroidectomies.[3]

There are multiple hypothesis on how it develops and its pathogenesis, ranging from the intrathyroidal hypothesis,[4-6] pharmacological hypothesis[6] and the inherited susceptibility and development hypothesis.[6] The most accepted etiopathogenesis is systemic autoimmune theory where higher expression of the gene PIK3CA stimulates fibroblasts growth factors which leads to fibrosis.[7-8] Unfortunately, the genetic testing for the same could not be done in the this case due to resource limitations.

Riedel's thyroiditis shows peak age incidence in 5th decade and gender predisposition with females affected more common than males and F to M ratio of 4:1[3] whereas

in our case male in his 4th decade was affected. It has been found to occur more commonly in smokers but in our case the patient developed Riedel's thyroiditis[3] despite being a non-smoker with no history of any substance abuse which doesn't coincide with the above finding.

Our patient presented with a thyroid swelling which had stony hard consistency similar to how thyroid swelling was originally described in Riedel's thyroiditis as 'eisenharte'.[9] 25-80% of the patients with Riedel's thyroiditis show hypothyroidism as thyroid gland undergoes fibrosis[9,10] but in our case the patient was euthyroid. Reidels patients usually have elevated Anti-TPO and thyroglobulin levels,[15,16,18] while our case was peculiar with normal Anti-TPO and thyroglobulin levels.

Ultrasonography for Riedel's Thyroiditis tends to show a hypoechoic and hypovascular lesion which are generally non-specific[2] since they mimic other thyroid conditions however in our case the findings were that of a hyperechoic solid lesion with areas of calcification and extrathyroidal extension.

Kumar et al. showed that one of the most important tools for diagnosis of thyroid pathologies, i.e. FNAC, is unreliable and cannot be depended upon to clinch the diagnosis of Riedel's thyroidits.[11] In our case too this fact was highlighted as the patient was diagnosed as a benign follicular disease (Bethesda category II) on FNAC

CECT of the neck was warranted in our case as patient had compressive symptoms and also to see the extent of the retrosternal extension. The general findings seen on CT are of hypo dense infiltrative mass[12] but in our case the CT findings showed heterogeneously enhancing hypodense nodules in right lobe of thyroid with multiple calcifications. MRI findings of Riedel's thyroiditis is not well known hence its role as a diagnostic tool is not useful.[13]

Mycophenolate mofetil, rituximab and low dose radiation have been used successfully[14] used for treatment of Riedel's thyroiditis as mentioned in literature.

Surgical intervention as a therapeutic modality is limed to debulking. Extensive resection is not preferred due to its infiltration in adjacent structures[15-17] and increased risk of post operative complications, upto 39%.[15] Our patient had compressive symptoms and tracheal deviation and thus the patient was subjected to surgery.

Conclusion

Riedel's thyroiditis is a rare inflammatory disease of thyroid gland which is difficult to differentiate between other more commonly encountered thyroid disorders. This case report highlights the importance of including Riedel's thyroiditis as differential diagnosis while evaluating patients presenting with hard thyroid swelling and compressive symptoms and such clinico-radiological-cytological contradiction. It is important that a timely diagnosis of Riedel's thyroiditis be made which helps in faster recovery and decreased associated complications.

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Spindle Cell Sarcoma of Pharynx: A Rare Case with Successful Management

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ABSTRACT

Introduction

Spindle cell sarcoma is a rare and aggressive malignancy characterized by spindle-shaped tumour cells. It can arise from various anatomical sites from soft tissue or bone. Involvement of the pharynx is relatively rare. This case report presents a unique case of spindle cell sarcoma in the pharynx, initially misdiagnosed as a vallecular space-occupying lesion on Fiber Optic Laryngoscopy but later confirmed as arising from the lateral wall of pharynx on HRCT. Accurate diagnosis and prompt management are essential for optimizing patient outcomes.

Case Report

A 57-year-old male patient presented to the ENT clinic with a two-month history of stridor and difficulty in swallowing. The patient had no significant medical or surgical history. Fibreoptic laryngoscopy revealed a large vallecular space-occupying lesion obstructing the airway and impeding deglutition. The patient was scheduled for surgery after a thorough clinical and radiological evaluation. Contrast enhanced CT scan reveals SOL arising from the left side of pharynx with contrast uptake.

Discussion

Spindle cell sarcoma of the pharynx is a rare entity with limited reported cases. It poses a diagnostic challenge due to its atypical presentation and overlapping histopathological features with other spindle cell tumours. Immuno histochemistry plays a crucial role in confirming the diagnosis by evaluating specific markers. IHC, P-16 is a specific marker differentiating peripheral nerve sheath tumour from spindle cell sarcoma. Surgical excision remains the primary treatment modality, often combined with adjuvant therapy depending on the stage and extent of the disease.

Keywords

Spindle Cell Sarcoma; Vallecular Mass; Malignant Peripheral Nerve Sheath Tumour; Immunohistochemistry

Spindle cell sarcoma is a rare and aggressive malignancy characterized by spindle-shaped tumour cells. It can arise from various anatomical sites in the soft tissue like rarely Tonsillar area[5] or bone usually affecting long bones in the arms[1]. This case report presents a unique case of spindle cell sarcoma in the pharynx initially misdiagnosed as avallecular space-occupying lesion on FOL but later confirmed as arising from lateral wall of pharynx on HRCT.

The cancer typically starts in the connective tissue layers, such as those between muscles or the surrounding organs.[1,2] Accurate diagnosis and prompt management are essential for optimizing patient outcomes. Understanding the cell type and characteristics allows healthcare providers to better understand the probability of the spread of cancer. It can also identify the best possible treatments.

Case Report

A 57-year-old male patient presented to the ENT clinic with a two-month history of stridor and difficulty in swallowing. The patient had no significant medical or surgical history. Fibreoptic laryngoscopy revealed a large vallecular space-occupying lesion obstructing the airway and impeding deglutition. The patient was scheduled for surgery after a thorough clinical and radiological evaluation. Contrast enhanced CT scan reveals SOL

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arising from the left side of pharynx with contrast uptake.

The patient underwent an intraoral excision of the mass and pre op tracheostomy under general anaesthesia as intubation difficulty was anticipated. The surgical team achieved adequate exposure and excised the lesion completely. A tracheostomy was performed to secure the airway during the pre-operative period. Endoscopic endo-laryngeal approach was taken and the mass was removed with radiofrequency ablation using suction diathermy. The procedure was well-tolerated and the patient was transferred to the recovery unit for further monitoring. Decannulation was done on the 2nd post operative day.

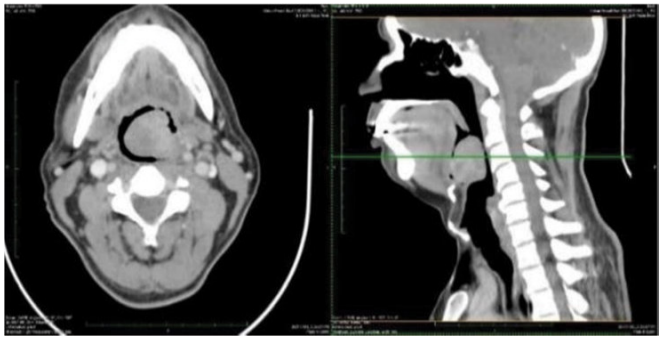

Fig. 1. Pre-Operative Contrast Enhanced Ct Scan Of Neck Showing Mass Is Arising From Lateral Wall Of Pharynx

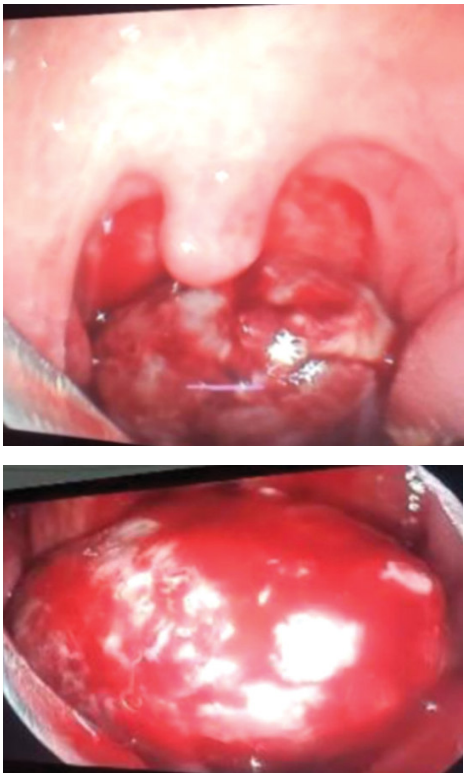

Fig. 2. Conventional D/L Scope With In Built 30 Degree Endoscope and Monitor showing a huge pre operative mass in the vallecular region

Fig. 3. Intra Operative Image

Fig. 4. Post operative image

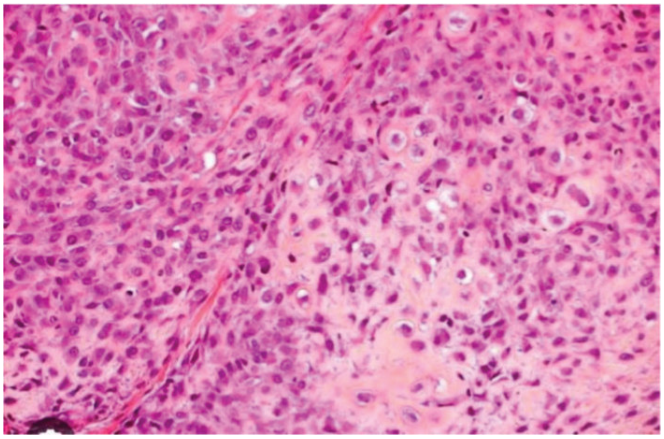

Fig. 5. Histopathology with 40x magnification using H & E stain revealed a high-grade spindle cell sarcoma consisting of elongated cells with ovoid nuclei and variable amount of cytoplasm

Immuno histochemical analysis demonstrated positive staining for vimentin, S100, EGFR, and p16[4,5]. These findings supported the diagnosis of spindle cell sarcoma. Two IHC reports have been done to emphasise and clear the diagnostic dilemma. One report is suggestive of malignant peripheral nerve sheath tumour whereas the other report suggests spindle cell sarcoma with myofibroblast differentiation revealed malignant peripheral nerve sheath tumour. However HPE and IHC done in another institute reveals spindle cell sarcoma and thus we confirmed it as Spindle cell Sarcoma.Following surgery, the patient received comprehensive postoperative care including pain management, tracheostomy care and enteral nutrition support. The patient's progress was closely monitored for any signs of complications or recurrence. The patient showed gradual improvement in symptoms postoperatively. Regular follow-up visits were scheduled to monitor for disease recurrence and to provide necessary supportive care.

Discussion

Spindle cell sarcoma of the pharynx is an extremely rare entity with limited reported cases[2]. It poses a diagnostic challenge due to its atypical presentation and overlapping histopathological features with other spindle cell tumours.[3]

Incidence of Spindle cell carcinoma in the head and neck region is 3% of all carcinomas and amongst them Spindle cell sarcoma in the pharynx is so rare that relevant incidence data is not known in the literature.[4]

Immuno histochemistry plays a crucial role in confirming the diagnosis by evaluating specific markers.[2] In this case, positive staining for vimentin, S100, EGFR and p16[4,5] supported the diagnosis of spindle cell sarcoma. IHC, P-16 is a specific marker differentiating peripheral nerve sheath tumour from spindle cell sarcoma. Surgical excision remains the primary treatment modality often combined with adjuvant therapy depending on the stage and extent of the disease.

However precautions related to the Anatomical site must be kept in mind. In our case, since the mass inloved pharynx, so preoperative Tracheostomy was done in order to protect the airway. Later on IHC and histopatholgy proved the case and the patient was treated adequately.

Conclusion

Spindle cell Sarcoma involving the pharynx is an extremely rare condition as per incidence. Importance of accurate diagnosis through histopathological examination and immune histochemical analysis is very ceratin[1,3]. Surgical excision followed by appropriate adjuvant therapy remains the cornerstone of treatment[5]. Further research and studies are needed to better understand the pathogenesis, prognosis, and treatment and it remains as a diagnostic dilemma.

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