



Fine Needle Aspiration Cytology of Head & Neck Lesions - Single Centre Study in a Rural Medical College

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ABSTRACT

Introduction

Diagnosis of swelling in the head and neck region is challenging due to the diversity of entities. Introduction of Fine Needle Aspiration Cytology (FNAC) in diagnostic protocol of Space Occupying Lesion (SOL) of head and neck region has reduced the number of unnecessary surgery and excision biopsy. FNAC has major contribution in transformation of cytology from a primarily screening tool to a powerful diagnostic technique in Neck Masses.

The present study was performed to evaluate the wide spectrum of lesions diagnosed by FNAC in patients with head and neck swellings and to know the efficacy of FNAC in diagnosing head and neck lesions

Materials and Methods

The present prospective, observational hospital based study was conducted in a medical college hospital in eastern India, catering mainly rural population. Eighty (80) patients were included in the study, after obtaining written consent, presenting with superficially palpable swellings of head and neck area. After explanation of procedure and taking informed consent of patient, FNAC was done following standard procedure and Cyto morphological diagnosis was recorded. Data were entered into a Microsoft excel spreadsheet and summarized as percentages for categorical variables.

Results

Lymph node (45%) is the most common site of FNAC followed by thyroid gland (24 %) and salivary gland (16%). Among the lymph node swellings, tubercular lymphadenitis is the commonest diagnosis. Among malignant cases of lymph nodes, metastatic carcinoma was seen in 8.3% with added information regarding type of carcinoma (adeno or squamous) and so about the primary site of the malignancy. In salivary gland lesions, Pleomorphic adenoma appears to be the commonest cytological diagnosis followed by sialadenitis cases. Regarding cytopathology of thyroid aspirates, 50% cases appeared as colloid goiter, 16.6% lymphocytic thyroiditis and 12.5% cases were papillary carcinoma. Cytopathology of other miscellaneous lesion of head and neck area aspirates show that inflammatory lesions constitute 25% of the cases.

Conclusion

Due to technical ease, considerable accuracy and cost effectiveness, FNAC can be an excellent screening test in the diagnosis of head and neck swelling. Introduction of FNAC in diagnostic protocol of head and neck space occupying lesion (SOL) has reduced the rate of open tissue biopsy as well as unnecessary surgery. Being a simple procedure, which can be carried out in peripheral regions, even in the health camps, without the needs of any major and costly infrastructure, can decrease the morbidity and mortality significantly by early diagnosis of neoplastic lesions in our rural population.

Keywords

Head and Neck Swelling; Fine Needle Aspiration Cytology (FNAC); Screening Test

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Fine needle aspiration cytology (FNAC) is helpful for the diagnosis of lesions arising from lymph nodes, thyroid, salivary gland, skin and soft tissue in head and neck region.^{1,2} Other lesions of head & neck area e.g., carotid body tumours, branchial cyst, thyroglossal cyst, cystic hygroma, pharyngeal pouch and lump of skin appendages are less commonly encountered.³ It may help in differentiating inflammatory and neoplastic lesions and thus helps to avoid unnecessary surgeries in non-neoplastic

lesions. Furthermore FNAC also expedites the process of management of malignant lesions.^{3,4} In cases of salivary gland tumours, FNAC can differentiate between a malignant and a benign tumour with over 90% accuracy.^{5,6}

This technique was introduced by Martin in 1930 for evaluation of head and neck lesion and the procedure has since then being used for all palpable swellings and in time, FNAC of the head and neck lesion is a well-accepted technique that has high specificity.⁷ This diagnostic accuracy makes FNAC a highly desirable alternative to open biopsy for investigation of cervical lymphadenopathy as well.⁸

Introduction of FNAC in diagnostic protocol of Thyroid Space occupying lesion (SOL) has reduced the rate of unnecessary surgery for thyroid nodules and has doubled the percentage of cancers found in the surgical materials.⁹

Existing Literature review indicates that clinical history and anatomical site of the lesion are valuable in terms of narrowing down the differential diagnosis of a SOL in head & neck area.

With this scientific knowledge, the present study was performed with the purpose to evaluate the wide spectrum of lesions diagnosed on FNAC in patients with head and neck swellings and to know the efficacy of FNAC in diagnosing head and neck lesions.

Materials and Methods

The present prospective, observational single center based study was conducted on in a medical college in rural area of Eastern India. Eighty (80) patients presenting with

superficially palpable swellings of head and neck who were referred to the Pathology department from April 2022 to March 2024 were included in the study.

Detail clinical history and significant examination findings were noted. After explanation of procedure and taking informed consent of patient/ guardian, FNAC was done using 10 cc disposable syringe and 22 gauge needle maintaining appropriate procedure. Three or four smears were prepared following standard guidelines. Smears were stained with Papanicolaou and Leishman-Giemsa stain. Ziehl- Neelsen staining for acid fast bacilli was done in suspected tubercular lesions. Cyto morphological diagnosis was given.

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. Data had been summarized as percentages for categorical variables.

Results

Majority of the patient are in the age group of 16-45 years (65%). 20% patient are in the age group of 46-60 years and 15% are in the age group of 1-15 years. Male patient constitute 40% and female patient constitutes 60% of study population. (Table I)

Lymph node (45%) is the most common mother tissue detected, followed by thyroid gland (30%), salivary gland (20%) and other miscellaneous lesion 5%. (Table I)

Tubercular lymphadenitis is found in 38.8% cases of lymph node swelling, acute suppurative lymphadenitis in 22.2% cases and Reactive hyperplasia is the diagnosis

Table I: Distribution of patients according to demographic characteristics and site of lesion

ASPIRATION SITE	NO. OF CASES	FEMALE CASES	MALE CASES	AGE (1-15 YRS)	AGE (16-45 YRS)	AGE (46-65 YRS)
Thyroid	24	15 (62.5%)	09 (37.5%)	02 (8.33%)	16 (66.66%)	06 (25%)
Salivary Gland	16	07 (43.7%)	09 (56.25%)	02 (12.5%)	10 (62.5%)	04 (25%)
Lymph Node	36	22 (61.1%)	14 (38.8%)	07 (16.66%)	25 (69.44%)	04 (11.1%)
Miscellaneous	04	04 (100%)	0	01 (25%)	01 (25%)	02 (50%)
Total	80	48 (60%)	32 (40%)	12 (15%)	52 (65%)	16 (20%)

Table II: Type of lesions according to FNAC findings

ASPIRATION SITE	NO. OF CASES	BENIGN	MALIGNANT	INFLAMMATORY	INCONCLUSIVE DIAGNOSIS
Thyroid	24 (30%)	14 (58.33%)	04 (16.66%)	06 (25%)	0
Salivary Gland	16 (20%)	07 (43.75%)	01 (6.25%)	08 (50%)	0
Lymph Node	36 (45%)	09 (25%)	05 (13.88%)	22 (61.11%)	0
Miscellaneous	04 (5%)	00	00	01 (25%)	03 (75%)
Total	80	30 (62.5%)	10 (12.5%)	37 (46.25%)	03 (3.75%)

Table III: Cytopathology of lymph node aspirates

CYTOLOGICAL DIAGNOSIS OF LYMPH NODE ASPIRATES		NO. OF CASES	PERCENTAGE
Inflammatory	Tubercular Lymphadenitis	14	38.8%
	Acute Suppurative Lymphadenitis	08	22.2%
Malignant	Metastatic Carcinoma	03	8.3%
	Lympho proliferative disorder	02	5.5%
Benign	Reactive Hyperplasia	09	25%
	Total	36	100%
CYTOLOGICAL DIAGNOSIS OF SALIVARY GLAND ASPIRATES		NO OF CASES	PERCENTAGE
Benign	Pleomorphic Adenoma	7	43.75%
Malignant	Adenoid Cystic Carcinoma	1	6.25%
Inflammatory	Acute Sialadenitis	4	25%
	Chronic Sialadenitis	3	18.75%
	Total	16	100%
FNAC DIAGNOSIS OF THYROID ASPIRATE		NO. OF CASES	PERCENTAGE
Benign Lesions	Nodular Colloid Goiter	12	50.0%
	Thyroglossal Cyst	2	8.33%
Malignant	Papillary Carcinoma	3	12.5%
	Inconclusive	1	4.16%
Inflammatory Lesions	Hashimoto's Thyroiditis	2	8.33%
	Lymphocytic Thyroiditis	4	16.66%
	Total	24	100%
CYTOPATHOLOGY OF OTHER MISCELLANEOUS LESION ASPIRATES		NO. OF CASES	PERCENTAGE
Inflammatory		01	25%
Inconclusive		03	75%
Total		04	100%

in 25% cases in this group. Among malignancy detected in lymph nodes, metastatic carcinoma was seen in 8.3% while lympho proliferative disorder was diagnosed in 5.5% cases of total lymph node mass.

Acute and chronic sialadenitis constitutes 25% and 18.75% cases of salivary lesions. Pleomorphic adenoma appears to be the cytological diagnosis in 43.75% cases.

50% cases of thyroid swelling appeared as nodular colloid goiter, 16.6% cases were lymphocytic thyroiditis and 12.5% cases were papillary carcinoma.

Inflammatory lesions constitute 25% of miscellaneous lesions. 3 cases were in conclusive in cytological diagnosis. (Table II & III)

Discussion

In the present study, Lymph node constitutes 63.9%, 18.2% by thyroid, 3.5% by salivary gland SOL and 14.3% by other soft tissue SOL, which corroborating the results seen in studies of Nanik J et al.¹⁰

However, Studies Kishore H et al.¹¹ and Sreedevi P et al.¹² shows a bit different statistical figures. But in all

these studies, lymph node swellings are highest in number. (Table IV)

Granulomatous lymphadenitis constitutes 38.8% cases in our study which is in between the results of other studies done by Valia LG et al.¹³ (30.12%), Kishore H et al.¹¹ (47.36%) and Sreedevi P et al.¹² (27.4%). (Table V)

In our study, reactive lymph nodes constitute 25% cases, which is similar to results obtained by Valiya LG et al.¹³ (28.79%). Metastatic lymphnodes constitutes 8.3% cases in our study which is very similar to statistics obtained by Sreedevi P et al.¹² as 5.88%. (Table V)

In the present study, 60% cases are female and 40% cases are male, who were presented to department for FNAC of head neck area SOL (Table I). Similar results of female preponderance are also reported by Raj bhandari M et al.¹⁴ and Kishor H et al.¹¹ and Chauhan S et al.¹⁵ However Patel D et al.¹⁶ reported male preponderance in their study.

Table I also shows that maximum number of patient are in the age group of 16-45 years (65%). 20% patient are in the age group of 46-60 years and 15% are in the

Table IV: Comparison of results of FNAC of head and neck studies

STUDY	LYMPHNODE	THYROID	SALIVARY GLAND	SOFT TISSUE
Nanik J ¹⁰	64.3%	17.5%	4.8%	13.5%
Kishor H. et al ¹¹	39.58%	31.25%	18.75%	7.29%
Sreedevi P ¹²	50.32%	44.07%	3.28%	2.3%
Present study	63.98%	18.25%	3.5%	14.3%

Table V: Comparison of results in Lymph-node Lesion

LESION	VALIYA LG ¹³	KISHORE ¹¹	SREEDEVI P ¹²	PRESENT STUDY
Reactive lymphadenitis	28.79%	35.08%	51.63%	25%
Non-specific inflammation	19.13%	12.80	9.15	22.2%
Granulomatous lesions	30.12	47.36	27.4	38.8%
Metastasis	19.80	3.50	5.88	8.3%
Lymphoma	2.16	0.87	5.88	5.5%

age group of 1-15 years. These findings are similar to Kishor H et al.¹¹ and Valiya L et al.¹³

Lymph node (45%) is the most common site of FNAC followed by thyroid gland (30%), salivary gland (20%) and other miscellaneous lesion 5%. (Table 2). However studies by Fernandes H et al.¹⁷ and Rathod G et al.¹⁸ found thyroid lesions the commonest.

Among the SOL, 62.5% cases appear as benign, 12.5% cases are malignant and 46.25% cases are of inflammatory pathology (Table 2), However Studies by Patel D et al.¹⁶ and Taviad D et al.¹⁹ got in their study, inflammatory pathology as the commonest cause.

Among the lymph nodes (Table 3), Tubercular lymphadenitis is found in 38.8% cases, acute suppurative lymphadenitis in 22.2% cases and Reactive hyperplasia is the diagnosis in 25% cases, which was in concordance with studies of Kishor H et al.¹¹ and Rathod G et al.¹⁸ However Patel D et al.¹⁶, Fernandes H et al.¹⁷ and Taviad D et al.¹⁹ found reactive hyperplasia as the commonest pathology in their studies.

Among malignant cases, metastatic carcinoma was seen in 8.3% while lympho proliferative disorder was diagnosed in 5.5% cases. (Table 3). In these cases FNAC not only confirmed the malignancy but also gave a vital information regarding type of carcinoma (adeno or squamous) and about the primary site of the malignancy.

Table III depicts the FNAC picture of salivary gland lesions. In this study, acute and chronic sialadenitis constitute 25% and 18.75% cases of salivary lesions. In studies done by Kishor H et al.¹¹ and Rathod G et al.¹⁸, sialadenitis was most common lesion. In our study, Pleomorphic adenoma appears to be the cytological diagnosis in 43.75% cases. Similar findings were reported by Patel D et al.¹⁶ and Fernandes H et al.¹⁷

Table III also shows cytopathology of thyroid aspirates. In our study, 50% cases appeared as nodular colloid goiter. 16.6% cases were lymphocytic thyroiditis and 12.5% cases were papillary carcinoma. Kishor H et al.¹¹, and Valiya L et al.¹³ in their studies also showed nodular colloid goiter as the commonest lesion.

Rathod G et al.¹⁸ and Fernandes H et al.¹⁷ also described

papillary carcinoma as the commonest malignancy of thyroid by FNAC diagnosis.

Table III depicts Cytopathology of other miscellaneous lesion of head and neck area aspirates. Inflammatory lesions constitute 25% of the cases in our study. In studies done by Chauhan S et al.¹⁵ and Singal P et al.²⁰, Lipoma was the most common lesion and epidermal cyst was the second most common (29.03%). In our study 3 cases were inconclusive. This could be due to inadequate or excessively hemorrhagic aspirate and non-representative sampling.

Table 4 elaborates the comparison between different studies regarding FNAC diagnosis of head & neck swelling. In our study, Lymph node constitutes 63.9%, 18.2% by thyroid, 3.5% by salivary gland SOL and 14.3% by other soft tissue SOL. Similar results are seen in studies of Nanik J et al.¹⁰ Studies Kishore H et al.¹¹ and Sreedevi P et al.¹² shows a bit different statistics which is mainly attributable to catering population of the center of study.

Table V depicts a comparison between different studies regarding FNAC diagnosis of lymph nodes of head and neck area. In our study granulomatous lymphadenitis constitutes 38.8% cases in a medical college catering rural India which is in between the results of other studies done by Valia LG et al.¹³ (30.12%), Kishore H et al.¹¹ (47.36%) and Sreedevi P et al.¹² (27.4%) depending on the epidemiology of local population. In our study, reactive lymph nodes constitute 25% cases, which is similar to results obtained by Valiya LG et al.¹³ (28.79%). However in studies by Sreedevi P et al.¹², the same value is 51.63%. Metastatic lymphnodes constitutes 8.3% cases in our study which is very similar to statistics obtained by Sreedevi P et al.¹² as 5.88%.

Conclusion

The present study is done in a tertiary care center in a district town of North Bengal, catering rural population mostly. It adds to the demographic knowledge of head and neck lesions as well as increased prevalence of metastatic lesion in lymph nodes compared to similar studies in other parts of India. Among the lymph nodes

pathology, tubercular lymphadenitis is the commonest diagnosis in our population which dictate the more aggressive case detection of extra-pulmonary tuberculosis in rural areas of our country where tuberculosis is still a major public health problem. Furthermore, tubercular lymphadenitis cases can be easily taken under treatment cover with this easy, accurate and cost effectiveness excellent screening test. Thyroid and salivary gland lesions can be diagnosed with considerable accuracy regarding the nature of tumor by FNAC, and accordingly surgical planning can be laid down.

Among malignant cases of lymphnodes, metastatic carcinoma was seen in 8.3%. In these cases FNAC not only confirmed the malignancy but also gave a vital information regarding type of carcinoma (adeno or squamous) and about the primary site of the malignancy. So FNAC, a simple procedure which can be carried out in peripheral regions and villages in health camps, without the needs of any major and costly infrastructure, can decrease the morbidity and mortality significantly by early diagnosis of neoplastic lesions in our rural population.

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