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The spectrum of various palpable lesions in head and neck region in a tertiary care hospital-FNAC study

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Abstract
Introduction: Head and neck swellings contribute to half of all aspirates being done for cytological examination. The present study was conducted to assess the frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings.
Methods: A total of 841 patients with head and neck swellings reporting to Department of Pathology for FNAC were included.
Results: Male to female ratio was 0.51:1. Majority of the cases were in the age group of 31-40 years (35.7%). 64.4% of the swellings were seen in thyroid, 30% in cervical lymph nodes, 5.1% in salivary glands and 0.5% was constituted by other sites. Malignant lesion was seen in 9% cases. Most of the thyroid lesions were found to be colloid goitre (52%). Malignancy was seen in 7.9% of thyroid swellings. Among the cervical lymph node enlargements, 57.9% cases were of reactive lymphadenitis while 11.9% were of malignancy.
Conclusion: The most common site of involvement was thyroid gland. The most common benign lesion seen was colloid goitre while malignancy of cervical lymph nodes was the most common malignant lesion.

Keywords: FNAC, head and neck swellings, observational study, pathological changes

Introduction

Head and neck swellings are responsible for about half of all the sites aspirated for cytopathological examination. The lesions mainly include neoplastic and non-neoplastic conditions of lymph nodes, thyroid gland, salivary glands and other tissues [1]. In India, 23% of all cancers in males and 6% in females occur in this region and is responsible for large number of aspirates being done from these areas. Pathological lesions of cervical lymph nodes contribute to significant morbidity [2].

Lesions of head and neck region are superficial and hence, easily accessible for fine needle aspiration cytology (FNAC). FNAC of head and neck lesions is safe, easy to perform and cost-effective procedure. It can be rapidly performed as a day care procedure, does not need admission and has minimal complications [3]. FNAC does not leave scar and there is only a theoretical risk of seeding of the needle tract. The interpretation is simple and results can be obtained quickly. Due to these reasons, it is well accepted by the clinicians in favour of incisional biopsy [4].

Various researchers have studied the profile of cytopathological lesions in different areas which is reflective of the disease trend in that particular place. It also helps surgeons in anticipating the illness and differential diagnosis. Study of trends of illnesses is important in planning for healthcare delivery [5-10].

The clinical and pathological findings vary from place to place and also changes with time. Very few studies have recently been done in this area. Hence, this study was conducted.

Aims & objectives- The present study was conducted to assess the frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings.

Material and Methods

Study setting: The present study was conducted at the department of Pathology, Kasturba Medical College, and Manipal. Karnataka. It is a tertiary care institute in Karnataka situated near the Western Ghats.

Patients from the neighbouring districts of Karnataka, Kerala and Goa visit this place.

Duration and type of study: The present study was hospital based cross sectional in nature conducted between December 2016 to November 2017.

Study subjects: Study subjects included patients reporting to OPD of the institute and found to be suffering from head and neck swellings were included.

Inclusion criteria: Patients above 18 years of age suffering from head and neck swellings who had FNAC of these swellings included in the present study.

Exclusion criteria: Cases who were seriously ill, who did not give consent or in which FNAC was not performed were excluded.

Sampling: All the patients with head and neck swellings reporting during the study period and fulfilling the selection criteria were included in the present study. A total of 841cases were included.

Data collection procedure: The patients were selected from the OPD and IPD wards. Detailed clinical history was obtained from the patients and findings were noted. They were then referred to pathology department. The patients were explained about FNAC and its importance and informed consent was taken from them.
Aspirations sites included thyroid, salivary gland, lymph nodes and soft tissue. With aseptic precautions, FNAC was done using 10 cc disposable syringe and 22/23-gauge needle by both aspiration and non-aspiration technique as required. Three to four smears of the aspirated material were prepared following standard guidelines. Smears were wet fixed in 95% alcohol and stained with PAP and MGG stain. Air dried smears were stained using Leishman stain. This was followed by careful microscopic examination and cytological diagnosis. The findings were noted in pre-tested semi-structured proforma.

Data analysis: Data was entered in Microsoft Excel 2010. Data analysis was done using Statistical Package for Social Sciences (SPSS) v 16.0. Data were summarized as frequency and percentage for categorical variables and mean and SD for numerical variables. Statistical tests were done as needed. P-value of <0.05 was considered to be statistically significant.

Ethical consideration & permission: Approval from Institutional Ethics Committee was obtained. The study participants were informed about the importance and informed consent was taken. Confidentiality of records were maintained.

Results

The present study included 841cases of head and neck swellings. Table-1 shows age and sex distribution of the cases. It is seen that 33.7% of the cases were males while 66.3% were females. Male to female ratio was 0.51:1. Majority of the cases were in the age group of 31-40 years (35.7%) followed by 21-30 years (24.3%).

Table 1: Showing age and sex distribution of cases

Age group (in years)	Male	Female	Total
<=20	36	72	108
21-30	60	144	204
31-40	132	168	300
41-50	36	96	132
51-60	12	60	72
>60	7	18	25
Total	283	558	841

Table-2 shows that 64.4% of the swellings were seen in thyroid, 30% in cervical lymph nodes, 5.1% in salivary glands and 0.5% was constituted by other sites. Malignant lesion was seen in 9% cases while benign tumour was seen in 64.1% cases. Malignancy was most frequently seen in cervical lymph nodes (11.9%) followed by thyroid (7.9%). One case of lipoma and two cases of abscess were seen. Chi-square test showed that difference between various sites was statistically significant (p=0.00).

Table 2: Showing nature of lesions according to site

Site	Benign tumour	Malignant tumour	Inflammatory/ Reactive	Inadequate sample
Thyroid (n=542, 64.4%))	309 (57%)	43 (7.9%)	158 (29.2%)	32 (5.9%)
Cervical lymph node (n=252, 30%)	199 (78.9%)	30 (11.9%)	10 (4%)	13 (5.2%)
Salivary gland (n=43, 5.1%)	-	3 (7%)	38 (88.3%)	2 (4.7%)
Others (n=4, 0.5%)	1 (50%)	-	2 (50%)	1 (25%)
Overall (n=841)	537 (64.1%)	76 (9%)	180 (21.2%)	48 (5.7%)

$\chi^2 = 72.3$, p=0.00

Table-3 shows findings of cytological examination. Most of the thyroid lesions were found to be colloid goitre (52%). 14% cases were of lymphocytic thyroiditis and 11.1% were of Hashimoto's thyroiditis. Malignancy was seen in 7.9% cases. Among the cervical lymph node enlargements, 57.9% cases were of reactive lymphadenitis, 21% were of granulomatous lymphadenitis and 11.9% were of malignancy. Among salivary gland lesions, pleomorphic adenoma was seen in 51.2% cases, sialadenitis in 20.9%, and Warthin's tumour in 9.3% and malignancy in 7% cases.

Table 3: Showing diagnosis on FNAC

Site	Cytopathological diagnosis	Frequency	%
Thyroid (n=542)	Malignant Cases	43	7.9
	Colloid goitre	282	52
	Lymphocytic thyroiditis	76	14
	Hashimoto's thyroiditis	60	11.1

	Follicular Neoplasm	27	5
	Others	22	4.1
	Inadequate sample	32	5.9
Cervical lymph nodes (n=252)	Reactive lymphadenitis	146	57.9
	Granulomatous lymphadenitis	53	21
	Malignancy	30	11.9
	Others	5	2
	Abscess	5	2
	Inadequate sample	13	5.2
Salivary Gland (n=43)	Pleomorphic adenoma	22	51.2
	Sialadenitis	9	20.9
	Warthin's tumour	4	9.3
	Suspicious for malignancy	2	4.7
	Adenoma	2	4.7
	Inadequate sample	2	4.7
	Others	1	2.3
	Malignancy	1	2.3
Others (n=4)	Lipoma	1	25
	Reactive	2	50
	Inadequate sample	1	25

Discussion

FNAC has been introduced Martin and Ellis in the year 1930 for diagnosis of various lesions. Representative sample and high quality of preparation are required for successful diagnosis by [9]. Head and neck cancers account for one-fourth of all cancers in males and 6% of those in females. Palpable lesions of head and neck contribute to half of all aspirates for cytological examination and is due to simplicity of the procedure, reliability and easy access of head and neck lesions for FNAC [11]. Accurate diagnosis by FNAC depends upon various factors including the experience of pathologist and clinician, their effort towards achieving perfection, clinician's willingness to accept the responsibility for positive, negative and equivocal report and familiarity of pathologist with details of the clinical history, physical examination and the results of laboratory investigations [1].

Studies have been conducted to see the pattern of lesions of head and neck region upon FNAC. Very few works have been done recently regarding this in this area. Hence, the present study was conducted to assess the frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings. A total of 841 patients reporting to the department of pathology, Kasturba Medical College, Manipal Academy of higher education, Manipal were examined.

In the present study, male to female ratio was seen to be 0.51:1. Majority of the cases were in the age group of 31-40 years (35.7%) followed by 21-30 years (24.3%). Female predominance has been seen in the studies in which thyroid lesions predominate. Vedashree *et al* also reported that females were predominant (63.88%) and males constituted only 36.11% [11]. Shariar *et al* observed that the age of patients ranged from 11 to 70 years with female predominance [12]. On the other hand, Nanik *et al* found that overall male to female ratio was 1:1. Head and neck swellings were present most frequently in the third decade (23.2%) followed by the second (16.8%) and fifth (13.9%) decade respectively. Similar results were obtained by Jadhav *et al* who found that age ranged from 11 days to 95 years in which 51.44% were males and 48.56% were females [3]. Suryawanshi *et al* also found similar trend and in their study, maximum no. of patients were in the age group of 21-30 years (32.63%) followed by 31-40 years (20.83%) and least no. of patients were seen in age group of above 70 years. 58.33% were females and 41.67% were males. Arora *et al* also observed maximum incidence in the age group of 21-30 years [2].

64.4% of the swellings were seen in thyroid, 30% in cervical lymph nodes, 5.1% in salivary glands and 0.5% was constituted by other sites. This is similar to the findings of Vedashree *et al* who commented that most of the cases were in thyroid (48.6%), followed by lymph node (40.2%) and equal incidence of lesions in the salivary gland and skin (5.5%) [11]. On the other hand, Nanik *et al* found that lymph node swellings were the most common (64.3%) lesions followed by thyroid (17.5%), skin & soft tissue (13.5%) and salivary gland swellings were least common (4.8%). Non-neoplastic lesions were the commonest (67.3%) overall followed by malignant lesions (13.1%). Only 9.3% cases remained inconclusive [3]. In the study done by Jadhav *et al* also, lymph nodes lesion (33%) was the predominant site followed by thyroid lesions (30.31%), miscellaneous (22.80%) and salivary gland lesions (13.88%). Head and neck lesions were cytologically categorised into nonneoplastic (52.12%), neoplastic (45.89%) and remaining (1.98%) were inadequate due to scant cellularity and haemorrhagic [4]. Similar findings were obtained by Suryawanshi *et al* who found lymph nodes lesion as the predominant site of FNAC followed by thyroid lesions (31.25%), salivary glands (18.75%) and soft tissue (7.29%). FNAC was inconclusive in 9 (3.12%) cases. Site of head and neck lesions thus vary in different studies and have some regional pattern [2].

Malignant lesion was seen in 9% cases while benign tumour was seen in 64.1% cases. Malignancy was most frequently seen in cervical lymph nodes (11.9%) followed by thyroid (7.9%). Shariar *et al* reported that benign, malignant and indeterminate lesions were 90%, 7.2% and 2.8% respectively. Indeterminate lesions were proved to be malignant by histopathology [12].

Most of the thyroid lesions were found to be colloid goitre (52%). 14% cases were of lymphocytic thyroiditis and 11.1% were of Hashimoto's thyroiditis. Malignancy was seen in 7.9% cases (Figure-1 showing papillary carcinoma). Vedashree *et al* found that lymphocytic thyroiditis was the

predominant lesion (57.14%) followed by colloid goitre (42.85%) [11]. Nanik *et al* observed that highest percentage of non-neoplastic lesions (81.81%) was in the thyroid lesions. 4 cases were diagnosed as malignant [3]. Inflammatory lesions including Hashimoto's thyroiditis, chronic lymphocytic thyroiditis were found by Suryawanshi *et al* in 28.88% of cases. Benign neoplastic lesions constituted 69.97% of cases. In malignant lesions one case (1.11%) of papillary carcinoma was observed [2].

Among the cervical lymph node enlargements, 57.9% cases were of reactive lymphadenitis, 21% were of granulomatous lymphadenitis and 11.9% were of malignancy. Vedashree *et al* found that out of 10 smears from lymph node clinically suspicious of tuberculosis, two were positive for Ziehl Neelsen stain and Auramine O stain. Three cases showed metastatic deposits [11]. Nanik *et al* observed that in lymph nodes, the highest number of cases was of non-neoplastic (70.3%) lesions. Malignant lesions were 18.1%, being higher than in the other categories. 3 smears were diagnosed as suspicious of malignancy. Arora *et al* commented that 43.31% cases were having non-specific reactive lymphadenitis [3]. Suryawanshi *et al* found that tubercular lymphadenitis (47.36%) was the predominant cause of lymphadenopathy followed by reactive lymphadenitis in 40(35.08%) cases [2].

Among salivary gland lesions, pleomorphic adenoma was seen in 51.2% cases (Figure-2), sialadenitis in 20.9%, Warthin's tumour in 9.3% (Figure-3) and malignancy in 7% cases. Out of four salivary gland lesions, three had chronic sialadenitis (75%) and one had Pleomorphic adenoma (25%) in the study done by Vedashree *et al*. [11] Nanik *et al* found that benign tumours (47.66%) were highest in number while there was no malignant lesion. Inconclusive cases were 8.33%. 1 smear was suspicious of malignancy [3]. In the study conducted by Suryawanshi *et al*, sialadenitis was observed in 66.66% of cases. Benign neoplasm included 13(24.07%) cases of pleomorphic adenoma and two cases (3.70%) of benign lymphoepithelial cyst [3]. cases of malignant neoplasms were reported including one case of each of carcinoma ex pleomorphic adenoma, mucoepidermoid carcinoma and anaplastic carcinoma [2].

One case of lipoma and two cases of abscess were seen. All the cutaneous lesions were epidermal cyst cytologically in the study done by Vedashree *et al*. [11] Nanik *et al* found that among skin and soft tissue lesions, 43.13% smears were non-neoplastic. Percentage of inconclusive smears (13.72%) was highest in the category of skin and soft tissue lesions. 6.9% lesions were malignant in this category. As very few skin and soft tissue lesions were found in the present study, it is difficult to draw conclusions on this basis [3].

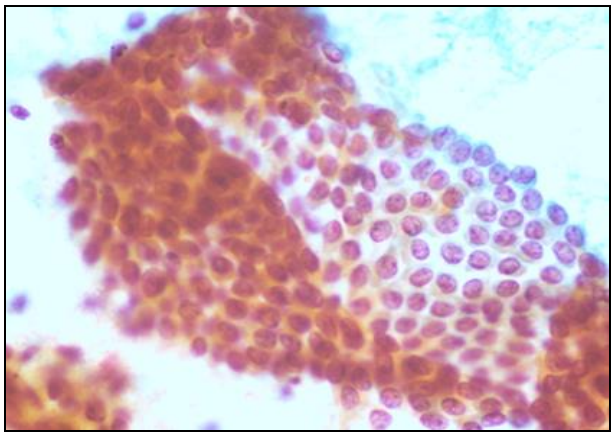

Fig 1: Showing papillary carcinoma of thyroid (Papanicolau stain 400x)

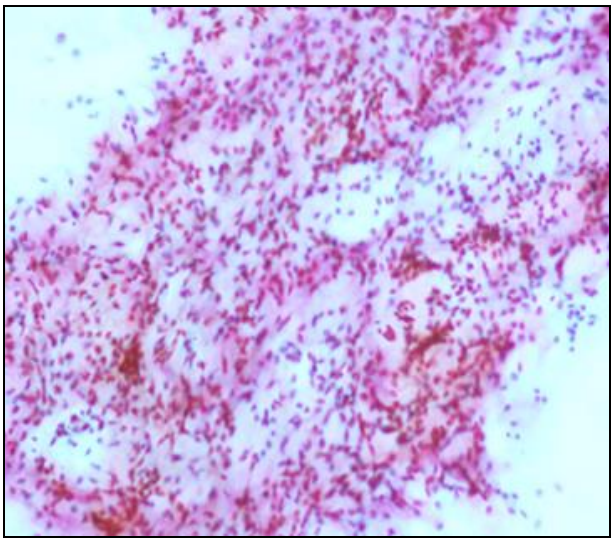

Fig 2: showing pleomorphic adenoma of parotid gland (Papanicolaou stain 100x)

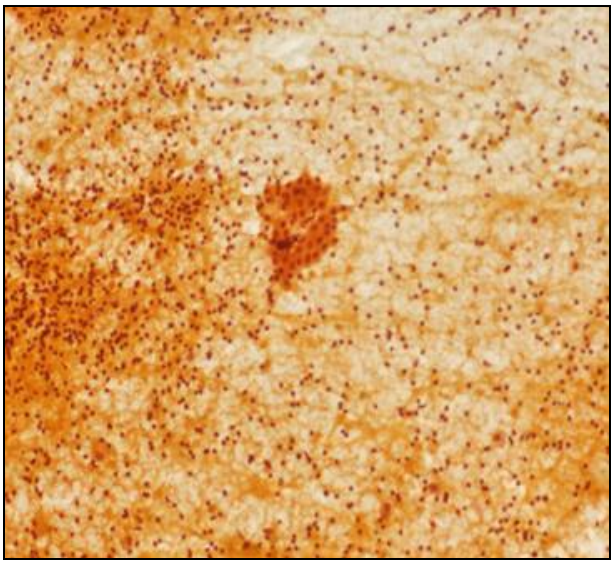

Fig 3: Showing Warthin's tumour (Papanicolaou stain 100x)

Conclusion

It can be concluded from the present study that the most common site of involvement was thyroid gland. The most common benign lesion seen was colloid goitre while malignancy of cervical lymph nodes was the most common malignant lesion. FNAC is a safe, cheap and cost-effective method for first line investigation of swellings of head and neck region

Limitations of the study: The present study was descriptive in nature and only described the clinical and cytopathological profile of head and neck swellings. Further study with comparison with biopsy findings can be conducted to assess the diagnostic value of FNAC.

What the current study adds to the existing knowledge- The cytopathological findings of FNAC in head and neck swellings in this area have been described. The patient profile and common lesions seen have been elaborated.

Contribution by authors

Dr Pulak Raj-Principal author collected data and has written

the report.
Dr. Brij Mohan Kumar Singh - Corresponding author edited the article and written the discussion.
Dr Arijit Bishnu-Did data analysis and helped in statistical part.

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