Spectrum of Head and Neck Lesions in A Rural Tertiary Care Hospital

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Abstract

Background: Fine Needle Aspiration Cytology (FNAC) is an affordable quick procedure that offers a prompt diagnosis. FNAC is the first-line investigation of choice for evaluating the head and neck lesions. The aim of the present study is to evaluate the role of FNAC in diagnosis of head neck lesions and to study the spectrum of head neck lesions in rural population.

Method: The study included 203 patients who presented with palpable head and neck swelling in a rural tertiary care hospital from January 2022 to November 2022. Detailed clinical history of patient was noted. Fine Needle Aspirations were done by inserting a 22-23G needle with a 10mL syringe into the palpable swelling. Smears were made and stained with May Grunwald Giemsa, Papanicolaou, and Haemotoxylin and Eosin (H&E) stains. The FNAC slides were screened and final diagnosis were noted for all cases.

Results: The mean age of the study sample was 40.3 ± 22.54 years. Majority of the patients in our study were males (55.8%). Patients presented with swellings in various sites in the head and neck region of which majority of the swellings were found in thyroid gland (49.7%) followed by swelling in neck (16.2%), cervical lymph node (13.7%) and sub mandibular region (3.4%). Commonest cytological diagnosis made was reactive lymphadenitis (18.2%), followed by Hashimotos thyroiditis (14.2%). 48.4% of cases in our study were inflammatory, 40.3% were benign and 11.2% were malignant lesions.

Conclusion: The present study concluded that FNAC is a quick, simple and cost-effective diagnostic procedure which differentiates inflammatory, non-neoplastic and neoplastic lesions thereby avoiding unnecessary surgeries and helps in proper patient management.

Keywords: FNAC, head and neck, cytology diagnosis.

Introduction

Fine Needle Aspiration Cytology (FNAC) is an affordable, quick, and straight forward outpatient procedure that can offer a prompt diagnosis. A clinician's first preference is always a technique that is fast, somewhat pain-free, safe, costeffective, and accurate, and this is what FNAC is all about.^[1] For many deep-seated lesions in addition to nearly all superficial palpable swellings, it is eminently suitable as the initial line of examination. FNAC was first designed as a way to confirm a clinical suspicion of a local cancer recurrence or metastasis without putting through additional surgical the patient intervention.^[2] FNAC is a tried-and-true, easy office technique with excellent diagnostic precision & accuracy. The diagnostic accuracy's specificity and sensitivity fall between 60% and 80%, respectively.^[3]

Head and neck swellings are frequently encountered in clinical practice. The head and neck lesions contribute to significant morbidity and mortality in India. FNAC has been the first-line investigation of choice for evaluating these lesions as it provides rapid, safe, costeffective, and accurate diagnosis.^[4]

The aim of the current study is to evaluate the role of FNAC in diagnosis of head neck lesions and to study the spectrum of head neck lesions in rural population.

Materials and Methods

This study was conducted in the department of Pathology in a rural tertiary care hospital in Karnataka. The study group included 203 patients who visited Medical, surgical, and dermatology department with a superficially palpable head and neck lesion who were advised to undergo the FNAC procedure and subsequently underwent FNAC procedure in the Pathology department in our hospital. The study duration was 11 months from January 2022 to November 2022. Detailed history of the case along with detailed local examination of the swelling were performed for all cases. After obtaining informed consent from the patient, FNAC was done in the FNAC procedure room for all cases. FNAC procedure followed is as follows.

Negative pressure was given after inserting a 22-23G needle with a 10mL syringe into the palpable swelling. To gather samples from various locations all around, the needle was pushed back and forth inside the bulk as well as in various directions. The plunger was kept retracted the whole procedure to maintain negative pressure in the syringe. If blood was aspirated, the process was terminated and the needle was removed before being used again at a different location. When it was decided that the aspiration was over, the plunger was let go to equalize the pressure in the syringe before the needle was removed. preventing the loss of cells from the needle's lumen to the syringe. The needle was then removed when the syringe was separated from it. To stop any blood loss, sterile gauze was used to apply pressure at the aspiration site for a while.

By adding 2 mL of air to the syringe and reattaching the needle, the aspiration material was distributed across the glass slides. The plunger of the syringe was advanced while the needle tip was on the surface of a clean, greasefree glass slide to force the aspirated material onto the slide. Smears were made on the slide using a spreader slide, and the slides were fixed in alcohol and stained appropriately with stains, such as May Grunwald Giemsa, Papanicolaou, and Haemotoxylin and Eosin (H&E) stains. An unstained slide was kept for all cases to be used for any special stain if required. When a clinical diagnosis of granulomatous disease was made, as well as in cases with a lot of necrosis and suppuration, smears were air-dried, stained with Leishman stain, Toluidine blue stain, and the others were preserved unstained to be used for Ziehl- Neelsen (ZN) staining. When the fluid was aspirated, the fluid was centrifuged, the sediment was formed into smears, and then the aforementioned staining techniques were applied to the smears.

The FNAC slides were screened and reported. Cytological findings and final diagnosis were noted for all cases.

Statistics

Statistical analysis of cytological data was done with the help of IBM SPSS (version 23.0). Descriptive data were represented in the form of frequencies and means.

Results

FNAC samples were collected from 203 patients for analysis. The mean age of the study sample was 40.3 ± 22.54 years. Majority of the patients with head and neck swellings were in the age range of 31 to 40 years (29.06%), followed by 61 to 70 years (20.6%) (Table 1 & Figure 1).

Majority of the patients in our study were males (55.8%), whereas female patients contributed only 44.12% of the study population (Figure 2).

The head and neck swellings were encountered in various sites in our study. The majority of the swellings were found in thyroid gland (49.7%) followed by swelling in neck (16.2%), cervical lymph node (13.7%) and sub mandibular region (3.4%) (Table 2).

The mean size of the lesions was 2.34 ± 0.15 cm. The smallest lesion was 0.5 cm whereas the largest reported lesion was 8 cm in diameter.

The cytological diagnosis of all cases were made after seeing the cytological features on FNAC slides (Table 3). Out of 203 cases, maximum number of cases reported was reactive lymphadenitis seen in 18.2% of the study population followed by Hashimotos thyroiditis seen in 14.2% of the patients. No definitive diagnosis could be made in 7 patients due to scanty material and hemorrhage.

The lesions were further classified into inflammatory, benign and malignant based on the diagnosis made (Table 4 & Figure 3). 48.4% of cases were inflammatory, 40.3% were benign and 11.2% were malignant.



Figure 1: Age distribution of the study population



Figure 2: Sex distribution of the study population



Figure 3: Classification of the lesions based on FNAC diagnosis

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Age group (in years)	Frequency	Percentage (%)		
0-10	14	6.8		
11-20	9	4.4		
21-30	22	10.8		
31-40	59	29.06		
41-50	25	12.3		

Table 1: Age Distribution of the Study Population

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51-60	20	9.8
61-70	42	20.6
71-80	11	5.4
> 80	1	0.4
Total	203	100%

Table 2: Site-wise distribution of the head & neck swellings

	Site	No. of lesions	Total Percentage
Lymph node (49)	Cervical lymph nodes	28 (13.7%)	24.13
	Supraclavicular swelling	4 (1.9%)	
	Post auricular swelling	11 (5.4%)	
	Submental swelling	6 (2.9%)	
Salivary gland (11)	Parotid swelling	4 (1.9%)	5.4
	Submandibular swelling	7 (3.4%)	
Thyroid gland (101)	Thyroid region	101 (49.7%)	49.7
Skin, subcutaneous and	Neck	33 (16.2%)	20.6
soft tissue (42)	Facial swelling	5 (2.4%)	
	Midline swelling	4 (1.97%)	
	Total	203	100%

Table 3: Cytological diagnosis of head and neck lesions

Site	Diagnosis	Frequency	Percentage
Lymph node (n=49)	Reactive lymphadenitis	37	18.2
	Granulomatous lymphadenitis	11	5.4
	Non-Hodgkins Lymphoma	1	0.4
Skin, subcutaneous	Epidermoid/Keratinous cyst	9	4.4
and soft tissue	Acute suppurative inflammatory lesion	7	3.4
(n=40)	Benign cystic lesion	8	3.9
	Lipoma	3	1.4
	Hypertrophic fat	1	0.4
	Squamous cell carcinoma	11	5.4
	Basal cell carcinoma	1	0.4
Salivary gland	Sialadenitis	4	1.9
(n=11)	Pleomorphic adenoma	2	0.9
	Mucoepidermoid carcinoma	3	1.4
	Acinic cell carcinoma	2	0.9
	Inflammatory thyroid lesion	3	1.4
Thyroid gland	Benign thyroid lesions	4	1.9
(n=96)	1. Lymphocytic thyroiditis- 4		
	2. Adenomatoid goiter-5	5	2.4
	3. Nodular/colloid goiter- 28	28	13.7
	4. Hashimotos thyroiditis- 29	29	14.2
	5. Hyperplastic goiter- 15	15	7.3
	6. Atypia of undetermined	3	1.4
	significance-3		
	7. Follicular neoplasm-5	5	2.4
	Papillary thyroid carcinoma	4	1.9
	No opinion	7	3.4
	Total number of lesions	203	100%

Site	Inflammatory	Benign	Malignant
Lymph node	48 (24.4%)	0	1 (0.5%)
Skin, subcutaneous	7 (3.5%)	21 (10.7%)	12 (6.1%)
and soft tissue			
Salivary gland	4 (2.04)	2 (1.02%)	5 (2.5%)
Thyroid gland	36 (18.3%)	56 (28.5%)	4 (2.04%)
	95 (48.4 %)	79 (40.3%)	22 (11.2%)

Table 4: Classification of cytological diagnosis of head and neck lesions

Discussion

FNAC is the process of aspirating cells from suspected lesions using a fine needle for diagnostic purpose. Particularly in places with limited financial & healthcare resources, FNAC has revolutionized the diagnosis of the lesions/ swellings by reducing the morbidity of excisional or incisional biopsy.^[5,6] FNAC has some distinct advantages as it is rapid diagnostic procedure, has lower risk than surgical biopsy, less invasive and thus cause minimal discomfort for the patient and readily repeatable so it can be used in multifocal lesions as well.^[7]

In the present study the lesions of head and neck were encountered at various sites in the patients (Table 2). The commonest site for swellings in the present study was thyroid gland (49.7%) followed by the swelling in the neck (16.2%), cervical lymph nodes (13.7%) and submandibular region (3.4%) &.

The most common diagnosis of the swellings in our study was reactive lymphadenitis due to inflammation of the lymph nodes in the head and neck region (18.2%) (Table 3). In a study by Soni et al., 47.45% of the head & neck swellings were found in lymph nodes.^[8] In another study by Shahid et al. that studied 518 FNAC samples, 356 swellings were present in lymph nodes.^[8,9] Similar trends were found in studies by Mallappa et al. & Srilatha et al. as well who showed lymph nodes to be the most common site for head and neck swellings.^[10,11]

Hashimotos thyroiditis (14.2%) was the second common diagnosis made in our studies (Table 3). The other causes for thyroid gland enlargement in

the present study was Nodular/colloid goiter (13.7%),Hyperplastic goiter (7.3%),goiter (2.4%), Lymphocytic Adenomatoid thyroiditis (1.9%), Atypia of undetermined significance (1.4%), Follicular neoplasm (2.4%), Papillary thyroid carcinoma (1.9%) and inflammatory thyroid cystic swellings (1.4%) (Table 3). In a study by Kaur A et al. thyroid gland was the second common site of swelling in the head and neck region and the most common cause for thyroid enlargement was colloid goiter (38.2%), followed by lymphocytic thyroiditis.^[12] The majority of the lesions in the present study were of inflammatory etiology (48.4%) followed by benign (40.3%) and malignant (11.2%) cases (Table 4 & Figure 3). Studies by Shrivastava et al., and Ahmad et al. reported 88% & 86.4% of the lesions as benign.^[6,13]

One of the important advantages of FNAC is that it helps in categorizing lesions into inflammatory, benign & malignant based on the cytological morphology and can thus help in preventing patients with inflammatory and benign lesions to go under the knife for excision.

In a country like India which is endemic for tuberculosis (TB), it can be one of the major superficial lymphadenopathy. reasons for Various types of cytological appearances have been described in the literature for tubercular lymphadenitis which mainly includes the following four categories: epithelioid granulomas with caseous necrosis, epithelioid granulomas without necrosis, necrosis only without epithelioid granulomas and polymorphs with necrosis with without epithelioid or

granulomas.^[2,14] 5.4 % of the patients had swelling that was attributable to TB in the present study. The results were confirmed after the demonstration of tuberculous bacilli using AFB stains in those patients whose FNAC finding was suggestive of TB. Numerous studies have demonstrated the preponderance of cervical nodal involvement in tuberculosis, which may be related to infection of the tonsils and adenoids acting as a portal of entry.^[6,15] Tuberculous lymphadenopathy is the most prevalent kind of extra-pulmonary tuberculosis, when cervical clusters of lymph nodes are most frequently affected.

Neoplastic lesions accounted for 11.2 % of the overall samples in the present study. Squamous cell carcinoma was the most common diagnosis among the malignant lesions. This finding was similar to a study by Bhagat et al., who reported squamous cell carcinoma as the most common malignant neoplasm.^[16]

The majority of the patients were males in the present study. This finding was similar to studies by Mukul et al., and Wilkinson et al., which showed a male preponderance in the study population.^[17,18] However, studies by Chauhan et al., and Betsill et al., have reported a higher female patient population as well.^[19,20]

Conclusions

The mean age of the study population in the present study is 40.3 ± 22.5 years and majority of the patients are males (55.8%). Most of the swellings occurring in the head and neck region were of inflammatory etiology followed by benign and malignant causes. Reactive lymphadenitis was the commonest inflammation, Colloid goitre was the most common benign lesion, and squamous cell carcinoma was the most commonly encountered malignancy. The present study concluded that FNAC is a quick, simple and cost-effective diagnostic procedure which differentiates inflammatory, nonneoplastic and neoplastic lesions thereby avoiding unnecessary surgeries and helps in proper patient management.

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