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Original Research Article

Clinical study and management of non-thyroidal neck swellings

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ABSTRACT

Background: Swellings in the neck are common and are encountered frequently in General Surgery. A diagnosis may be possible based on clinical examination alone but, investigations are required to clarify the diagnosis and, to exclude a diagnosis of malignancy. With this background, the present study is conducted in an effort to find out the causes for non-thyroidal neck swellings, and to assess the various investigations and management available for treating these neck swellings.
Methods: The study was conducted on newly diagnosed non thyroidal neck swelling cases coming to the Dept. of General Surgery, ENT, Oro- Maxillofacial and Pulmonary Medicine (OPD and IPD), Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune. The study was conducted from July 2017 to July 2019. Data collection included history taking, clinical examination, and radiological investigation and histopathological examination by specific pathologist throughout the study. After confirmation of diagnosis, patients were subjected to further management.
Results: Among 100 patients, male to female ratio was 1:1. The Mean age of the participants is 40.41±12.85 years. There was statistically significant association between tobacco addiction and malignant neck swelling. Considering HPE as gold standard, the sensitivity and specificity of fine needle aspiration cytology (FNAC) diagnosis is 81.8% and 100% respectively.
Conclusions: The overwhelming amount of possible diseases linked to a swelling in the neck, makes it of utmost importance to follow a strict protocol for appropriate diagnosis making and prompt treatment so as to prevent diagnostic delay.

Keywords: Non-thyroidal neck swellings, Benign, Malignant, FNAC

INTRODUCTION

Swellings in the neck are common and are encountered frequently in General Surgery. It ranges from simple benign lesions to highly malignant manifestations. Patients presenting with neck swellings are often fearful of cancer.[1]

The common pathologies encountered in the neck presenting as a lump are lymphadenopathies (specific and non-specific, acute and chronic), metastatic carcinoma, lymphoma, thyroid swellings (goiter, nodules and cyst) and salivary gland tumours (sialadenitis, cysts, adenomas and carcinoma). The less common pathologies presenting as swelling in the neck are carotid body tumor, branchial cyst, thyroglossal cyst, cystic hygroma, pharyngeal pouch and lumps of skin appendages.[2]

Neoplasms of neck region are a major form of cancer in India, accounting for 23% of all cancer in males and 6%

in females.[3] Tobacco and alcohol plays an important role in their etio-pathogenesis. The disproportionately higher prevalence of malignancies in the neck region in relation to other malignancies in India may be due to the use of tobacco in various forms, consumption of alcohol and low socioeconomic condition related to poor hygiene, poor diet or infections of viral origin.[4-6]

The overwhelming amount of possible diseases linked to a swelling in the neck, makes it of utmost importance to follow a strict protocol for appropriate diagnosis making and prompt treatment so as to prevent diagnostic delay.

Basic anatomical knowledge of head and neck for clinical diagnosis, appropriate clinical examination, investigations, surgical skills and experience are very essential for an early diagnosis and prevent operative injuries and complications.[7]

Ultrasound is a useful screening modality because of the lack of ionizing radiation and is non-invasive. USG can define the location, size and extent of the mass, relation to surrounding normal structures and the internal characteristics of the mass.

But, sonography of neck lacks specificity in certain instances. The differentiation between inflammatory and malignant lymphadenopathy cannot always be made.[8]

Fine needle aspiration cytology (FNAC) is a simple, quick and cost effective method to sample superficial masses found in the neck. Masses located within the region of head and neck including salivary glands, can be readily diagnosed using this technique.[9] In the head and neck region, Fine needle aspiration cytology (FNAC) is of great value because of the multiplicity of accessible organs and heterogeneous pathologies encountered.

FNAC is helpful for the diagnosis of salivary gland tumor where it can differentiate between a benign and malignant tumour with 90% accuracy.[10] FNAC can be both diagnostic and therapeutic in cystic swellings.[11]

The morbidity associated with delayed or incorrect diagnosis must not be underestimated. A diagnosis may be possible based on clinical examination alone but, more commonly, investigations are required to clarify the diagnosis and in particular, to exclude or confirm a diagnosis of malignancy.

With this background, the present study is conducted in an effort to find out the causes for non-thyroidal neck swellings and to assess the various investigations and management modalities available for treating these neck swellings.

Henceforth in the study, neck swellings refer to non–thyroidal neck swellings.

METHODS

Study type

The "clinical study and management of non-thyroidal neck swellings" is the descriptive cross-sectional study.

Study setting

The present study was conducted on randomly selected newly diagnosed Non Thyroidal Neck Swelling cases coming to the Dept. of General Surgery, ENT, Oro-Maxillofacial and Pulmonary Medicine (OPD and IPD), Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune.

Study period

The period of data collection was done from July 2017 to July 2019. After collection of data, the data entry forms were checked for their completeness and missing and incomprehensible data was rechecked from the respective participant profile. Data entry was done in MS Excel data sheet. This procedure was conducted over the period of 2 months. The data auditing was done over a period of one month. The collected data was analysed over a three-month period and the report writing was completed by end of October 2019.

Sampling method

The samples were randomly selected from Department of General Surgery, ENT, Oro-Maxillofacial and Pulmonary Medicine (OPD and IPD). Patients were included in the study after taking their voluntary informed consent.

Inclusion criteria

Inclusion criteria were patients more than 18 years with neck swelling; duration of swelling more than 6 weeks; willing to be enrolled in study.

Exclusion criteria

Exclusion criteria were patients below 18 years of age; thyroid/ parathyroid swellings; previously operated/ treated cases of neck swellings

Study tools

Data was collected from the included patients by meticulous history taking, careful clinical examination, and appropriate radiological investigation by a specific radiologist and histopathological examination by specific pathologist throughout the study. A predesigned semi-structured questionnaire was prepared based on the review of literature on non-thyroidal neck swelling. The questionnaire included the information regarding age, gender, occupation, duration of symptom, tobacco addiction. It also included information regarding histo-

pathological findings, FNAC findings, ultrasonography findings and clinical diagnosis. After confirmation of diagnosis, patient will be subjected to further management.

Ethical issues

The study protocol was approved by the Scientific and Ethical Committee of the Institution. All the participants were also informed about the study procedure and the information required from them for the study. A voluntary informed written consent was taken from the participant those who consented were included in the study. A strict confidentiality was maintained about the personal details of the participants and information related to the study.

Statistical analysis

Data management and analysis was done using Microsoft excel and Epi-info software. The frequency distribution and graph were prepared for the variables. The categorical variables were assessed using Pearson chi-square. The test was considered significant only if the p value comes out to be less than 0.05. The concordance between histopathology test with FNAC, Ultrasonography and clinical diagnosis was assessed using sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy considering histopathology test as Gold standard.

RESULTS

Gender wise distribution of cases

The male to female ratio in our study was 1:1.

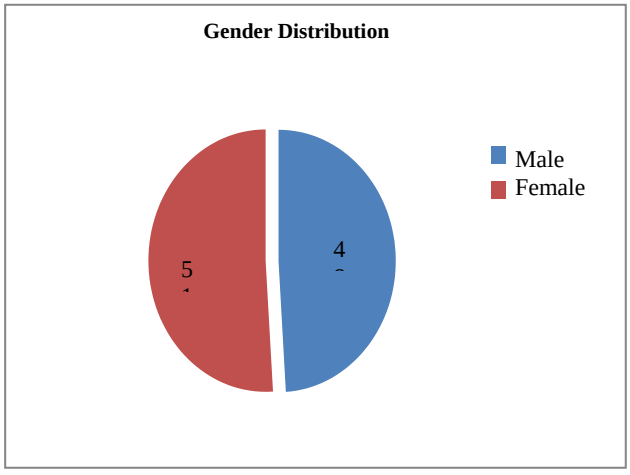

Figure 1: Gender wise distribution of cases.

Age group wise distribution of cases

The mean age of the participants is 40.41±12.85 years.

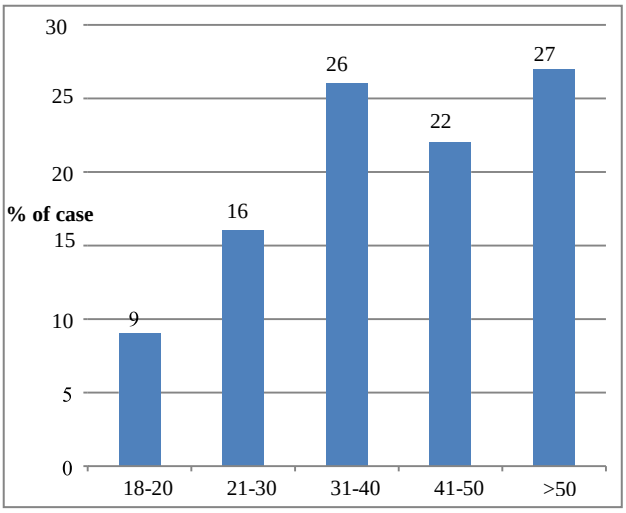

Figure 2: Age group wise distribution of cases.

Table 1: Clinical diagnosis of cases in study group.

Clinical diagnosis	Cases	Percentage (%)
Infective / inflammatory	39	39.0
Benign	35	35.0
Malignant	26	26.0
Total	100	100.0

Association with tobacco

There was statistically significant association between tobacco addiction and malignant neck swelling having p<0.001.

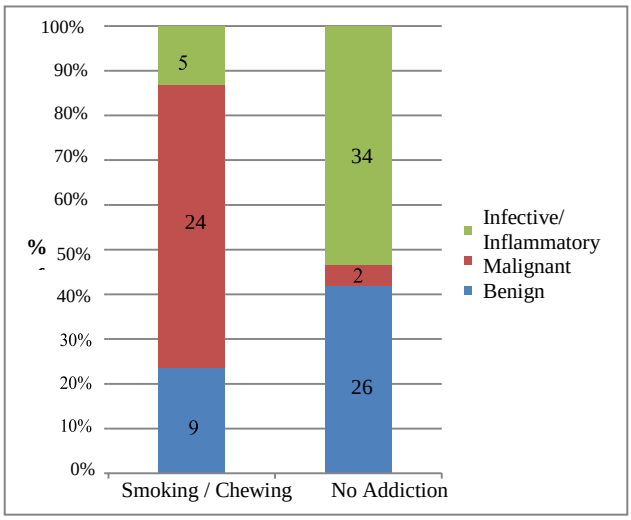

Figure 3: Association with tobacco.

The Table 3 shows distribution of cases according to correlation between clinical examination and FNAC. It was seen that 21 cases were malignant on both FNAC and clinical examination, 3 cases were malignant on FNAC and benign on clinical examination while 76 cases were benign on both FNAC and clinical examination.

Table 2: Final diagnosis wise distribution of cases.

Diagnosis	Cases	Percentage (%)
TB lymphadenitis	26	26.0
Secondary deposits	18	18.0
Lipoma	14	14.0
Sebaceous cyst	12	12.0
Branchial cyst	8	8.0
Reactive hyperplasia	7	7.0
Non Hodgkin's lymphoma	4	4.0
Hodgkin's lymphoma	4	4.0
Sialadenitis	3	3.0
Dermoid cyst	2	2.0
Hemangioma (left lingual artery as feeding vessel)	1	1.0
Madelung's disease	1	1.0
Total	100	100.0

Table 3: Correlation between clinical examination and FNAC in study group.

Clinical examination	FNAC diagnosis		Total
	Malignant	Benign	
Malignant	21	0	21
Benign	3	76	79
Total	24	76	100
Parameter	Estimate	Lower-upper 95% Cis	
Sensitivity	87.5%	(69, 95.66)	
Specificity	100%	(95.19, 100)	
Positive predictive value	100%	(84.54, 100)	
Negative predictive value	96.2%	(89.42, 98.7)	
Diagnostic accuracy	97%	(91.55, 98.9)	

Considering FNAC as gold standard, the sensitivity and specificity of clinical examination is 87.5% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of clinical examination is 100%, 96.2% and 97% respectively.

The Table 4 shows distribution of cases according to Correlation between USG diagnosis and FNAC. It was seen that 23 cases were malignant on both FNAC and USG diagnosis, 1 case was malignant on FNAC and benign on USG diagnosis while 76 cases were benign on both FNAC and USG diagnosis.

Considering FNAC as gold standard, the sensitivity and specificity of USG diagnosis is 95.8% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of USG diagnosis were 100%, 98.7% and 99% respectively.

In the present study, considering HPE as gold standard, the sensitivity and specificity of FNAC diagnosis is 81.8% and 100% respectively. The Positive Predictive Value, negative Predictive Value and Diagnostic accuracy of FNAC were 100%, 95.6% and 96.3% respectively.

Table 4: Correlation between FNAC and USG in study group.

USG	FNAC diagnosis		Total
	Malignant	Benign	
Malignant	23	0	23
Benign	1	76	77
Total	24	76	100
Parameter	Estimate	Lower - Upper 95% CI	
Sensitivity	95.83%	(79.76, 99.26)	
Specificity	100%	(95.19, 100)	
Positive predictive value	100%	(85.69, 100)	
Negative predictive value	98.7%	(93, 99.77)	
Diagnostic accuracy	99%	(94.55, 99.82)	

But the sensitivity and specificity of USG diagnosis were 72.7% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of USG were 100%, 93.6% and 94.5% respectively.

Table 5: Comparison of FNAC, USG and clinical examination considering HPE as gold standard.

Variables	FNAC (%)	USG (%)	Clinical examination (%)
Sensitivity	81.8	72.7	54.5
Specificity	100.0	100.0	100.0
Positive predictive value	100.0	100.0	100.0
Negative predictive value	95.6	93.6	89.8
Diagnostic accuracy	96.3	94.5	90.9

Considering HPE as gold standard, the sensitivity and specificity of clinical examination is 54.5% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of clinical examination were 100%, 89.8% and 90.9% respectively.

But if we considered FNAC as gold standard the sensitivity and specificity of clinical diagnosis is 87.5% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of clinical diagnosis were 100%, 96.2% and 97% respectively. Sensitivity of clinical examination is improved if we consider FNAC as gold standard.

Figure 4: Case of Hodgkins lymphoma.

Figure 5 (A and B): Unusual presentation of branchial cyst.

Figure 6: Pre-operative images of left lingual artery hemangioma.

Figure 7: Post embolization of left lingual artery.

Figure 8: Cases of Secondary metastasis to the neck.

Figure 9: Pre and post treatment of a case of Madelung's disease.

Table 6: Modalities of treatment in different cases.

Diagnosis	Treatment	Cases
TB lymphadenitis (26)	DOTS	26
Secondary deposits metastatic SCC (15)	Chemotherapy with radiotherapy	14
	Supraglottic laryngectomy followed by cisplatin based chemo 8 cycles along with radiotherapy	1
Secondary deposits metastatic epithelial malignancy (3)	Paclitaxel based chemotherapy along with radiotherapy	3
Lipoma (14)	Excision biopsy	14
Branchial cyst (8)	Excision biopsy	8
Sialadenitis (3)	Excision biopsy	3
Non-Hodgkin's lymphoma (4)	Cyclophosphamide, vincristine, doxorubicin and prednisolone	4
Hodgkin's lymphoma (4)	Adriamycin, bleomycin, vinblastine and dacarbazine regimen	4
Sebaceous cyst (12)	Excision biopsy	10
Infected sebaceous cyst (2)	Incision and drainage	2
Reactive hyperplasia (7)	Excision biopsy	3
	Antibiotics	4
Hemangioma (left lingual artery as feeding vessel)	Embolization of left lingual artery	1
Madelung's disease	Conservative management on 100 mcg T. Thyronorm	1
Dermoid cyst	Excision biopsy	2
Total		100

DISCUSSION

Gender wise distribution of cases

In the present study, it was observed that 49 (49.0%) cases were male and 51 (51.0%) cases were female. The male to female ratio in our study was 1:1.

In the study conducted by Karthikeyan et al, it was observed that 51 (51.0%) cases were male and 49 (49.0%) cases were female. The male to female ratio in this study was 1:1. The results of our study are almost similar to the results obtained by Karthikeyan.[12]

In the study conducted by Ozdas et al, it was observed that 66 (52.0%) cases were male and 61 (48.0%) cases were female. The male to female ratio in this study was 1.08:1. The results of our study are almost similar to the results obtained by Ozdas et al.[13]

In the study conducted by Biswas et al, it was observed that among the 36 metastatic non-thyroid neck mass 29 (80.5%) cases were male and 7 (19.5%) cases were female.[14] The male to female ratio in this study was 4.1:1. The proportion of male cases in the study conducted by Biswas is more than that of our study. The reason for this could be Biswas study was focused on neoplastic neck swellings while the present study looks for all non-thyroidal neck swellings.

Age group wise distribution of cases

In the present study, it was observed that 9 (9.0%) cases were between 18-20 years, 16 (16.0%) cases were between 21-30 years, 26 (26.0%) cases were between 31-40 years, 22 (22.0%) cases were between 41-50 years and 27 (27.0%) cases were more than 50 years of age.

In the study conducted by Karthikeyan et al, it was observed that 17 (17.0%) cases were between 0-10 years, 16 (16.0%) cases were between 11-20 years, 21 (21.0%) cases were between 21-30 years, 16 (16.0%) cases were between 31-40 years and 30 (30.0%) cases were more than 40 years of age.[12] The age distribution found in the Karthikeyan et al study is similar to the present study. The only difference is that in our study we have participants more than 18 years of age while Karthikeyan et al have participants of all ages.

In the study conducted by Biswas et al, it was observed that 4 (11.1%) cases were between 41-50 years, 15 (41.7%) cases were between 51-60 years, 14 (38.9%) cases were between 61-70 years and 3 (8.3%).[14] In the study conducted by Biswas et al, the study participants were above 40 years of age while in our study the participants were above 18 years of age.

Clinical diagnosis of cases in study group

In the present study, it was observed that 39 (39.0) cases were having infective / inflammatory pathology, 35

(35.0) cases were having benign pathology and 26 (26.0) cases were having malignant pathology.

In the study conducted by Biswas et al, it was observed that 8 (14.8) cases were having benign neoplasm and 46 (85.2) cases were having malignant neoplasm.[14] The reason for this could be Biswas et al. study was focused on neoplastic neck swellings while the present study looks for all non-thyroidal neck swellings.

In the study conducted by Bhattacharya et al, it was observed that 68% cases were having reactive and other diagnosis, 19% cases were having benign diagnosis and 13% cases were having malignant diagnosis.[15] In the study by Alam et al, it was observed that benign lesions were common than the malignant and commonest among them was soft tissue tumors (46.87%).[16]

In the study conducted by Ozdas et al, it was observed that 74 (58.2) cases were having benign Clinical diagnosis, 29 (22.8) cases were having malignant Clinical diagnosis and 24 (18.9) cases were having non-differentiated findings.[13] While in the same study on FNAB, it was observed that 41 (57.7) cases were having benign mass, 18 (25.3) cases were having malignant mass, 3 (4.2) cases were having both benign and malignant mass and 9 (12.6) cases were having non-diagnostic findings.

Association with tobacco

In the present study, it was observed that among 38 (38.0) cases who were smoking/chewing tobacco, 9 were having benign swelling, 24 were having malignant swelling and 5 were having Infective/ Inflammatory swelling while among 62 (62.0) cases who were not Smoking/Chewing tobacco, 26 were having benign swelling, 2 were having malignant swelling and 34 were having Infective/ Inflammatory swelling. There was statistically significant association between smoking addiction and malignant neck swelling having $p<0.001$.

In a study conducted by Deshpande et al, it was observed that among 37 cases of malignant neck swellings, 33 were having association with tobacco.[17]

In the study conducted by Bhattacharya et al, 29 (30.5) have smoked tobacco while 66 (69.5) have never smoked tobacco before.[15] Consumption of tobacco in any form either chewing or smoking increases the probability of getting cancer. Our study results are similar to these observations. In our study we observed significant association between tobacco use and malignant form of the disease.

Final diagnosis wise distribution of cases

In the present study, it was observed that 26 (26.0%) cases were having TB lymphadenitis, 18 (18.0%) cases were having Secondary deposits, 14 (14.0%) cases were having lipoma, 8 (8.0%) cases were having branchial cyst, 3 (3.0%) cases were having sialadenitis, 4 (9.0%) cases were having non-Hodgkin's lymphoma, 4 (4.0%) cases were having Hodgkin's lymphoma, 12 (12.0%) cases were having sebaceous cyst, 7 (7.0%) cases were having reactive hyperplasia, 1 (1.0%) cases were having hemangioma (left lingual artery as feeding vessel), 1 (1.0%) cases were having Madelung's disease and 2 (2.0%) cases were having dermoid cyst.

In the study conducted by Karthikeyan et al, it was observed that 27 (27.0%) cases were having TB lymphadenitis, 26 (26.0%) cases were having Secondary deposits, 5 (5.0%) cases were having branchial cyst, 3 (3.0%) cases were having thyroglossal cyst, 7 (7.0%) cases were having salivary gland tumor, 4 (4.0%) cases were having non-Hodgkin's lymphoma, 6 (6.0%) cases were having Hodgkin's lymphoma, 6 (6.0%) cases were having reactive hyperplasia, 7 (7.0%) cases were having Non-specific adenitis, 2 (2.0%) cases were having Lipoma, 1 (1.0%) cases were having Carotid body tumor, 1 (1.0%) cases were having Schwannoma, 1 (1.0%) cases were having Lateral aberrant thyroid, 1 (1.0%) cases were having lymph cyst, 1 (1.0%) cases were having Dermoid cyst and 2 (2.0%) cases were having Normal.

In the study conducted by Ozdas et al, it was found that 100 (78.7%) cases were benign and 27 (21.2%) cases were malignant.[13] In the study conducted by Talih Ozdas et al, 27 patients (21.3%) had pleomorphic adenoma, 11 patients (8.6%) had chronic granulomatous disease, 9 patients (7.1%) had Warthin's tumor, 7 patients (5.5%) had Lipoma, 6 patients (4.7%) had Thyroglossal duct cyst, 6 patients (4.7%) had chronic Sialoadenitis and Sialolithiasis, 6 patients (4.7%) had squamous cell carcinoma metastases, 5 patients (3.9%) had reactive lymphadenopathy, 5 patients (3.9%) had Branchial cleft cyst, 5 patients (3.9%) had Hodgkin lymphoma, 4 patients (3.1%) had non-Hodgkin lymphoma, 4 patients (3.1%) had Lymphangioma, 3 patients (2.4%) had Dermoid cyst, 3 patients (2.4%) basal cell adenoma, 2 patients had acinic cell carcinoma, 2 patients had papillary thyroid carcinoma metastases, 2 patients had benign lymphoepithelial cyst, and 20 patients (22.8%) had other diseases.

In the study conducted by Biswas et al, it was observed that among benign neoplasm pleomorphic adenoma was the commonest (37.5%), followed by Schwannoma (25%). Our study results are similar to these observations.[14]

Correlation between FNAC and USG in study group

In the present study, it was seen that 23 cases were malignant on both FNAC and USG diagnosis, 1 case was malignant on FNAC and benign on USG diagnosis while 76 cases were benign on both FNAC and USG diagnosis.

Considering FNAC as gold standard, the sensitivity and specificity of USG diagnosis is 95.8% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of USG diagnosis is 100%, 98.7% and 99% respectively.

In a study conducted by Rastogi et al, the Sensitivity of USG in diagnosing malignant lesions of the neck in 100 patients with neck swellings was 87.5% with a specificity of 98.7%, PPV 93.3% and NPV 97.5%. For swellings of inflammatory nature, this study showed the sensitivity, specificity, PPV and NPV of USG to be 87.2%, 96.6%, 94.4%, 91.9% respectively. For benign swellings, sensitivity, specificity, PPV and NPV was 97.5%, 91.3%, 88.6% and 98.1% respectively.[18] Our study results are similar to these observations.

Correlation between HPE v/s FNAC v/s USG v/s clinical examinations

In the present study, considering HPE as gold standard, the sensitivity and specificity of FNAC diagnosis is 81.8% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of FNAC are 100%, 95.6% and 96.3% respectively.

But the sensitivity and specificity of USG diagnosis is 72.7% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of USG are 100%, 93.6% and 94.5% respectively. The sensitivity of FNAC is higher than that of USG diagnosis. The specificity and positive predictive value are similar to FNAC. There was mild reduction in negative predictive value and diagnostic accuracy by USG diagnosis.

Considering HPE as gold standard, the sensitivity and specificity of clinical examination is 54.5% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of clinical examination is 100%, 89.8% and 90.9% respectively. The sensitivity of FNAC is much higher than that of clinical examination (81.8% v/s 54.5%). The specificity and positive predictive value are similar to FNAC. There was reduction in negative predictive value and diagnostic accuracy by clinical examination.

But if we considered FNAC as gold standard the sensitivity and specificity of clinical examination is 87.5% and 100% respectively. The positive predictive value, negative predictive value and diagnostic accuracy of clinical examination is 100%, 96.2% and 97% respectively. Sensitivity of clinical examination is improved if we consider FNAC as gold standard. HPE uses biopsy specimen for definitive diagnosis of cases.

In a study conducted by Deshpande et al, FNAC was done in 187 patients.[17] In tubercular lymphadenopathy it was positive in 85.3%. In 5.5% false negative result obtained. Sensitivity was found to be 85% and specificity was 95%. Lau et al showed similar results of sensitivity of 93% and specificity of 77%.[19]

In secondary malignant lymphadenopathy FNAC was done in all the cases and positive results obtained in 91.8% with sensitivity of 90% and specificity of 98%. Similar findings obtained in studies of Nada et al showing sensitivity of 90% and specificity of 98%.[20]

Our study results were similar to the above studies.

Distribution of cases according to treatment

Among TB lymphadenopathy, all patients got treated with DOTS Category 1. But 2 underwent excision biopsy because FNAC was suggestive of reactive lymphadenopathy, following which, they underwent DOTS therapy.

Among secondary deposit, 15 were metastatic SCC. Among the 15, 2 underwent excision biopsy, followed by Cisplatin based chemo 8 cycles along with radiotherapy for 3 weeks.

1 among 15 had primary supraglottic tumor hence underwent supraglottic laryngectomy followed by cisplatin based chemo 8 cycles along with radiotherapy.

Rest 12 underwent chemotherapy with radiotherapy. Among 15, four patients died within 6 months due to advanced disease.

Among secondary deposit, 3 were metastatic epithelial malignancy from carcinoma breast. All 3 patients underwent 6 cycles of paclitaxel based chemotherapy along with radiotherapy. 1 among the 3 had died due to pulmonary metastasis.

Among lipoma, everyone underwent excision biopsy. One patient of madelung disease was diagnosed by USG neck. FNAC of the patient was suggestive of lipoma. The patient had hypothyroidism and was treated with 100 mcg of T. Thyronorm. As Weight loss is a treatment for Madelung's disease, the patient lost 10 kgs following T. Thyronorm for 3 months and was managed conservatively with complete disappearance of the swelling.

Among 8 branchial cysts, 2 FNAC reports were inconclusive. All 8 patients underwent excision biopsy. Among 3 patients with sialadenitis, all 3 underwent excision biopsy. Among 4 Non-Hodgkins lymphoma, FNAC was positive for 3 while in one case it was inconclusive, hence underwent excision biopsy. All 4 patients underwent cyclophosphamide, vincristine, doxorubicin and prednisolone for 6 cycles.

Among 4 cases of Hodgkins lymphoma, FNAC was positive for 3 while in one case it was inconclusive, hence underwent excision biopsy. All 4 patients

underwent adriamycin, bleomycin, vinblastine and dacarbazine regimen chemotherapy for 6 cycles.

Among 12 cases of sebaceous cyst. 10 underwent excision biopsy and 2 were infected, hence underwent Incision and drainage.

Among 7 cases of reactive lymphadenitis, 3 underwent excision biopsy and 4 were managed with Antibiotics. Hemangioma was treated by embolization of the left lingual artery. Two cases of dermoid cyst were treated with excision biopsy.

In a study conducted by Deshpande et al,[17] all the patients of tubercular lymphadenopathy are initially treated by DOT"s regime. Recurrence occurred in 4 patients (3.6%). Five patients required surgical drainage (4.5%), and 1 patient required excision of lymph nodes due to post-operative wound infection and fistula formation.

Mericz in his study of 309 patients showed similar outcomes.[21] Jones and Campbell also mentioned that surgical treatment is required only in cases which fails to respond to treatment and when complication arises.[22]

Malignant secondary lymph nodes are mainly due to oropharyngeal primaries followed by laryngeal malignancies. 6 patients had occult primary after thorough investigations. Out of 37 patients with malignant lymph nodes, 12 were treated by neoadjuvant chemotherapy.

3 patients had recurrence after chemotherapy and required palliative radiotherapy in post-operative period. 10 patients were treated by radical radiotherapy. Rest 15 patients were treated by radical neck dissection.

Endicott in a study of 197 patients, where induction chemotherapy was used, 15% achieved complete response, 3.4% achieved partial response while rest had stable disease. In another study of 158 patients by Keith et al, where adjuvant chemotherapy was used in head and neck malignancies and 50% response rate was found.[23,24]

In lymphomas out of 21 patients, 13 were Non-Hodgkin's and 8 were Hodgkin's lymphomas. They were treated with chemotherapy alone. The treatment modalities in our study groups were similar to Deshpande et al.[17]

The treatment given to our study group patients are similar to the above studies.

CONCLUSION

On the basis of study results, we conclude that among the non-thyroidal neck swellings infective/inflammatory are the most common type followed by benign type of swellings.

Females are predominantly affected with TB lymphadenitis.

Males are predominantly affected with secondary neck metastasis.

Addiction to smoking or chewing of tobacco is significantly associated with malignant form of the swelling.

Among the final diagnosis, TB lymphadenitis followed by secondary deposits, lipoma and sebaceous cysts are the most common type of non-thyroidal neck swelling.

Considering HPE as gold standard, the sensitivity and specificity of FNAC diagnosis is 81.8% and 100% respectively, sensitivity and specificity of USG diagnosis is 72.7% and 100% respectively and sensitivity and specificity of clinical diagnosis is 54.5% and 100% respectively.

Excision biopsy is the treatment option for most benign swellings of neck.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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