Cytology of Head and Neck lesions in a tertiary healthcare centre in Saurashtra with Corroboration by Histopathology

Pathology

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ABSTRACT

The swellings in head and neck regions are not only common but are also challenging lesions when fine needle aspiration cytology (FNAC) is concerned. This study was conducted in Department of PathologyM.P.Shah medical college, Jamnagar over a period of two years to corroborate the FNAC findings of various head and neck lesions with histopathological examination.A total of 696 case were examined.Lymphnode lesions were the most commonly aspirated(55.03%) followed by thyroid (27.44%).Most common diagnoses were inflammatory(46.26%) followed by benign(30.89%) and malignant(17.96%), histopathological diagnosis were available for 127 cases(18.24%).This study illustrates the importance of FNAC as a primary and effective diagnostic tool in lesions of head and neck region.

KEYWORDS:

Fine Needle Aspiration Cytology, Head and Neck,Histopathology

INTRODUCTION

Head and neck lesions are a collection of diverse diseases, which due to their anatomical considerations present a considerable diagnostic dilemma to surgical pathologists. The proximity of the organs of the head and neck region makes it difficult for the surgical pathologist to focus on one of these organs and neglect the pathology of others, which are only a centimeter apart.1Complicating the matters further, the upper digestive tract and the upper respiratory tract, which meet in the larynx, have some basic diseases in common, notably squamous cell carcinoma.[2]

Fine needle aspiration is a minimally invasive technique that is particularly suitable for this sensitive area where incisional biopsies are problematic.It obviates the need for surgery for inflammatory diagnoses and allows for a more rational management plan. If not a specific diagnosis, it at least allows categorization of disease at community level for further investigations and referral[3,4.]

MATERIALS AND METHODS

Study Design:The present study was a prospective study conducted in the Surgical pathology section of Department of Pathology at ShriM.P.Shah Medical College and Shri Guru Gobind Singh General Hospital, Jamnagar over a period of 2 years ranging from April 2011 to March 2013.A total of 696 patients were received at the Cytopathology section with lesions in the head and neck region. Histopathological confirmation was advised and sought from the clinician whenever required.

Data Analysis: For the purpose of the study, all the cytology diagnoses were finally categorized into the following groups: Inflammatory, Benign, Malignant, Follicular lesions(applied only to thyroid lesions) and Unsatisfactory for evaluation. The histological diagnoses were similarly clubbed into the following groups:Inflammatory, Benign and Malignant lesions.

Histopathology – Cytology Correlation: All the histopathological diagnoses available for the cytology cases were compared and noted for discordance and root cause analysis done.
Statistical Analysis:Sensitivity, Specificity, Positive predictive value and Negative predictive value of cytology as a diagnostic tool for malignancies were calculated keeping histopathological diagnoses as the gold standard.

OBSERVATIONS

The present study is a prospective study of 696 cases of lesions of head and neck of all age groups.In 670 cases satisfactory material was obtained, repeat aspirations were done whenever needed, although in 26 cases the material remained unsatisfactory even after repeat aspirations. Help of radiological guidance was taken whenever required.

Lymph nodes of the head and neck were the commonest site aspirated followed by thyroid and salivary glands in the patients encountered in the present study.[Table I]

TABLE – I Site specific incidence (n = 696)

Site	Number	Percentage(%)
Lymph node	383	55.03
Thyroid	191	27.44
Salivary Glands	56	8.05
Oral cavity	9	1.29
Nose and Paranasal Sinuses	3	0.43
Soft tissue and misc.	54	7.76
Total	696	100

Inflammatory conditions were the commonest (46.26%) FNA diagnoses amongst all 696 aspirations while 3.74% aspirations were deemed unsatisfactory for diagnosis. All the diagnoses rendered have been outlined in Table II.

TABLE – II FNA Diagnoses(n=696)

Diagnosis	Number	Percentage(%)
Inflammatory	322	46.26
Benign	215	30.89
Malignant	125	17.96
Follicular	8	1.15
Unsatisfactory	26	3.74
Total	696	100.00

Inflammatory lesions were the commonest in lymph node lesions while benign lesions were a majority in thyroid, salivary glands and soft tissue lesions. Oral cavity had more of malignant lesions. Cases deemed unsatisfactory for diagnosis were maximum in thyroid lesions.Table III outlines all the diagnoses according to the sites and cytological diagnoses.

Table III Cytological Categorization (n = 696)

Site	Cytodiagnosis					
	Inflammatory	Benign	Follicular	Malignant	No opinion	Total
Lymph node	266	6	0	106	5	383
Thyroid	29	133	8	6	15	191
Salivary glands	21	33	0	0	2	56
Oral cavity	2	0	0	5	2	9
Nose	0	2	0	0	1	3
Soft tissue	2	41	0	10	1	54
Total	320	215	8	127	26	696

Histopathological diagnoses were available for 127 cases(18.24%). 543 cytological cases did not have histopathological correlation, majority of them being inflammatory. Maximum correlations were available for lymph node lesions followed by the thyroid lesions [Table IV].

Table –IV Histopathological Correlation (n=127)

Diagnosis	Number	Percentage
Benign	53	41.73
Inflammatory	17	13.39
Malignant	57	44.88
Total	127	100

Of the 6 discordances, five false negatives and one false positive case was observed[Table V].Their root cause analysis was done[Table VI].

Table - V Diagnostic Discrepancies (n=6)

Case No	Age	Gender	Organ	Cytodiagnosis	Histodiagnosis
1	80	M	Lymph node	Cystic lesion with secondary inflammation	Poorly differentiated carcinoma of
2	55	M		Chronic granulomatous lymphadenitis(tuberculosis)	Non keratinizing squamous cell carcinoma
3	30	M		Hodgkin's lymphma	Chronic granulomatous lymphadenitis
4	40	F	Thyroid	Nodular Goitre	Follicular variant of Papillary carcinoma
5	25	F		Hemorrhagic cyst with oncocytic change	Papillary carcinoma of thyroid
6	35	F	Soft tissue	Ruptured cyst giving rise to foreign body reaction	Well differentiated keratinizing

Table VI Root Cause Analysis of the Discrepancies

Case No.	Root Cause Analysis
1	Squamous cell carcinoma is known to present with cystic changes and the greatest risk of false negative diagnosis is in relation to cystic neoplasms or neoplasms with cystic changes.
2	Foreign body type giant cells and tumor diathesis were mistaken for Langhan's type giant cells and caseation necrosis
3	Without immunephenotypic confirmation, it is difficult to differentiate between a reactive lymph node and follicular lymphoma
4	I. Unclear features of papillary carcinoma such as papillary fragments, intranuclear cytoplasmic inclusions and nuclear grooves. ii. Prominent overlapping of nuclei was not noticed during the initial diagnosis
5	cystic variant of the papillary carcinoma of thyroid is a common differential diagnosis in cystic lesions in the neck.
6	Squamous cell carcinomas are known to present with cystic changes and foreign body giant cells are not an infrequent finding, owing to the large amounts of keratin production.

STATISTICAL ANALYSIS

True Positives = 46   False Positives = 01
True Negatives = 51   False Negatives = 05
According to the observations above, the calculations are as follows.
Sensitivity = 90.20%   Specificty = 98.07%
Accuracy = 93.27%   Positive Predicitive Value = 97.87%
                 Negative Predictive Value = 91.07%

DISCUSSION

Various authors have studied fine needle aspiration in patients with head and neck lesions. The data has been published under various headings including site specific and diagnoses specific headings.

Lymph node was the commonest organ to be aspirated followed by thyroid gland amongst all head and neck lesions in the present study which was in accordance with other studies conducted by Amatya et al,9, Fernandes et al 10 and Soni et al12. Tilak V et al.7, though, observed thyroid as the commonest gland to be aspirated.Present study could find histopathological correlation in 127(18.25%) cases out of the 696 cases of cytology of lesions of head and neck. Which was similar to studies conducted by Fernandes et al(20.80%)10and Amatya et al(11.1%) 9.This study had a discordance of 6(4.72%) cases out of the total 127 cases available for histopathological correlation. Similar findings were observed in other studies by Amatya et al (5.8%), 9Tatomirovic et al(4.26%) 11and Mahar et al(5.6%) [14.]

On statistical analysis it was found that the sensitivity in the present study was 90.20% which was comparable to studies by Tilak et al(90.91%)7, Tandon et. al (89.5%) 8 ,Tatomirovic et al(91.5%) 11,Wahid et al (90%) 13 and schwartz et al(92%)5.The specificity of 98.07% in the present study was comparable with that of Mobley and associates (97.1%)6, Tandon et. al(98.5%)8 ,Amatya et al (98%) 9and Nada et al(98.8%)16 .Positive predictive value of 97.87% was observed which correlated with Tandon et al(97.3%).8.Negative predictive value obtained in the present study was 91.07% which was comparable to Khan and Tanwani(91.4%)15. An overall accuracy of 93.27% was observed in the present study which corroborated with other authors Tilak et al (92.73%)7,Amatya et al (93%)9,and Khajuria et al (92%) [17.]

CONCLUSION

FNAC has the advantage of rapid diagnosis with being minimally invasive and beneficial owing to the proximity of the organs of the

head and neck region, which makes surgical interventions much harder. It is highly accurate when interpreted by experienced cytopathologists working closely with the clinician and the radiologist.

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