FNAC (FINE NEEDLE ASPIRATION CYTOLOGY) AS A PREOPERATIVE DIAGNOSTIC TOOL

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ABSTRACT

BACKGROUND

Fine needle aspiration cytology is a simple, inexpensive technique with a rapid turn-around time and is a minimally invasive technique with high specificity and sensitivity. FNAC is widely used for the diagnosis of parotid lumps, but is now also being extensively used in neck masses.

The objective of this study is to assess the sensitivity and specificity of FNAC of parotid masses with that of histopathological correlation and also to distinguish between a neoplastic and non-neoplastic lesion.

MATERIALS AND METHODS

A total of 40 patients who presented to ENT OPD at AJ Institute of Medical Sciences with swellings in the parotid region were taken retrospectively over 3 years. FNAC was done using 10 cc syringe and 20-26G needle and stained with Papanicolaou stain (or) May-Grunwald-Giemsa stain. Histopathological specimens were stained using Haematoxylin & Eosin (H&E) stained with paraffin sections.

RESULTS

Out of the 40 cases studied, during this period of 3 years, there was cytohistopathological correlation in 36 cases. Pleomorphic adenoma (PA) was the most frequent lesion in this study. The sensitivity, specificity and accuracy for benign lesions was 83% and malignancy was 95%.

CONCLUSION

FNAC is a simple, rapid, accurate, painless technique with excellent patient compliance and avoids unnecessary surgery or discomfort for the patient, thus making FNAC a useful tool in preoperative diagnosis of the parotid mass and plays a very important role in the management of the patient.

KEYWORDS

Parotid Swellings, FNAC, Sensitivity, Specificity, Accuracy.

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BACKGROUND

"Tumours of the parotid gland are a pathological puzzle and a source of unsatisfactory speculation".(1) Swelling involving the parotid gland may be as a result of inflammation, cyst or neoplasm. The nature of the lesion cannot be determined on clinical examination and therefore pathological examination is required for definite diagnosis in suspected cases of neoplastic disease. Nowadays fine needle aspiration cytology has emerged as an effective and sensitive technique in the diagnosis of lesions of parotid gland. Fine needle aspiration cytology is a simple, inexpensive technique with a rapid turn-around time and is a minimally invasive technique with high specificity and sensitivity. FNAC is widely used for the diagnosis of parotid lumps, but is now also being extensively used in neck masses.(2-4)

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Aims and Objectives

To assess the sensitivity and specificity of FNAC of parotid masses with that of histopathological correlation and also to distinguish between a neoplastic and non-neoplastic lesion.

MATERIALS AND METHODS

A retrospective study of 40 patients, who presented to the Department of Otorhinolaryngology and Head & Neck Surgery in our institution with swellings in the parotid region over 3 years. The FNAC was performed using 10 cc syringe and 20-26G needle. Aspirates were smeared on clean slides, wet smears were stained by Papanicolaou method and dry smears were stained using May-Grunwald-Giemsa (MGG) stains. The histopathological specimens were fixed in 10% formalin, routinely stained by Haematoxylin and Eosin (H&E) stain.(5) The specimen slides were examined and the preoperative cytology of the FNAC specimens with that of histopathological findings were compared and calculations made as to the sensitivity, specificity and accuracy for diagnosing benign and malignant lesions.

Inclusion Criteria

All parotid gland swellings with preoperative FNAC and histopathology were included in the study.

Exclusion Criteria

All head and neck swellings other than parotid swellings.

RESULTS

Out of the 40 cases studied, during this period of 3 years, there was cytohistopathological correlation in 36 cases. Pleomorphic adenoma (PA) was found to be the most frequent lesion in this study. The sensitivity, specificity and accuracy for benign lesions was 83% and malignancy was 94%. FNAC was performed on 40 patients with palpable parotid swelling. Out of the 40 cases, 22 were pleomorphic adenoma, 6 were of chronic sialadenitis, 2 were Warthin's tumours, 6 were mucoepidermoid carcinomas, 4 were acinic cell carcinomas. In which, 30 were reported as benign lesions and 10 were reported as malignant lesions.

FNAC	No. of Cases
Pleomorphic Adenoma	22
Chronic Sialadenitis	6
Warthin's Tumour	2
Mucoepidermoid Carcinoma	6
Acinic Cell Carcinoma	4

Out of these 40 cases, which underwent surgical excision followed by histologic evaluation, 16 cases were of pleomorphic adenoma, 6 cases of chronic sialadenitis, 2 cases of Warthin's tumour, 3 cases of parotitis, 4 cases of mucoepidermoid carcinoma, 4 cases of acinic cell carcinoma, 5 cases of adenoid cystic carcinoma were reported. In which, 27 were reported as benign and 13 were reported as malignant. Out of 40 cases, FNAC and histopathological correlation was available for 32 cases; remaining 8 cases had only cytological diagnosis. Pleomorphic adenoma was the most common benign lesion whereas mucoepidermoid carcinoma was the most common malignant lesion.

Histopathological	No. of Cases
Pleomorphic Adenoma	16
Chronic Sialadenitis	6
Warthin's Tumour	2
Parotitis	3
Mucoepidermoid Carcinoma	4
Acinic Cell Carcinoma	4
Adenoid Cystic Carcinoma	5

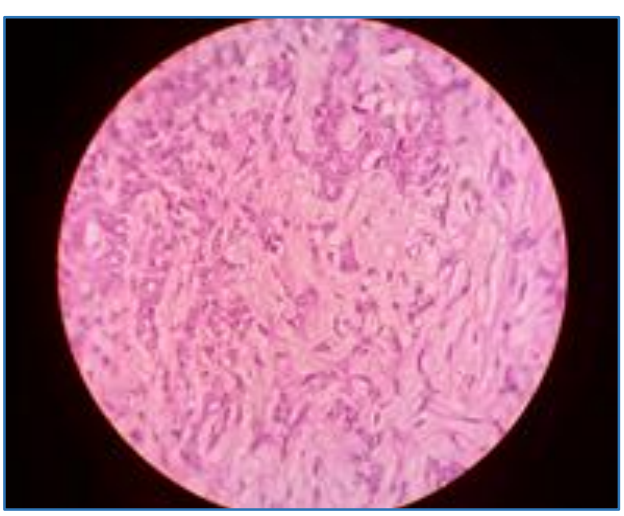

Figure 1. Microscopic View of Pleomorphic Adenoma

Microscopic features of pleomorphic adenoma: Well-encapsulated tumour tissue with heterogenous stromal elements consisting of chondromyxoid, fibrous and hyaline areas, and ducts and ductules of varying sizes lined by luminal cuboidal epithelial cells and outer layer epithelial cell. The admixed myoepithelial cells show spindle to plasmacytoid morphology.

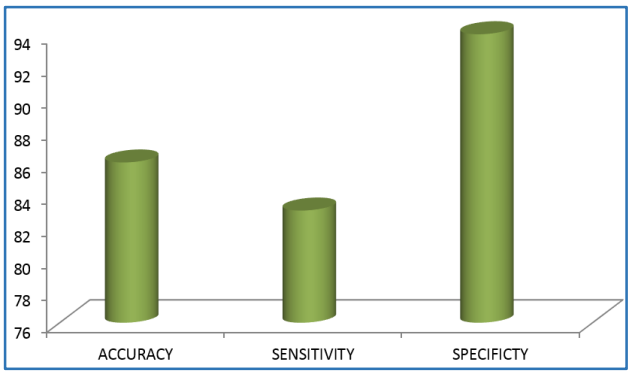

Figure 2. Comparison of Diagnostic Accuracy of FNAC

DISCUSSION

FNAC is a safe, simple, rapid and cost-effective procedure.[6] Besides helping in defining the nature of lesion, in some cases FNAC also helped in making specific diagnosis. Although, management of almost all neoplastic parotid gland lesions is by surgical excision, a preoperative diagnosis if benign or malignant assists the clinician in planning the extent of surgery. Swelling of parotid glands, presents as a common problem and being readily visible creates havoc among patients. FNAC provides a convenient way to obtain a tissue based diagnosis and therefore has now become a diagnostic test of choice to solve this dilemma. Our study explains the role of this procedure in our setup to diagnose parotid gland lesions and the spectrum of disease pathology in our population. Literature review revealed a wide variation in the sensitivity and specificity of FNAC for parotid gland swelling in different populations and setups.[6] Nguansangiam S et al studied 133 patients of which 70 were parotid gland tumours and 63 were submandibular gland tumours to detect malignancy revealing a accuracy, sensitivity and specificity of 97%, 81.3% & 99.1% respectively.[6] Zerpa et al studied 93 cases of parotid gland tumours to detect malignancy revealing a sensitivity and specificity of 57% and 95% respectively.[7] On the other hand, Pastore et al found a sensitivity and specificity of 83% and 93% respectively to detect malignancy.[8] Fakhry et al evaluated 249 parotid tumours, out of which 75% were benign and 25% were malignant.[9] The sensitivity and specificity to detect malignancy was assessed to be 80% and 89.5% respectively. The diagnostic accuracy for benign and malignant tumours was 16% and 44% respectively. We found an overall sensitivity and specificity for FNAC to detect malignancy was 83% and 94% respectively, and the diagnostic accuracy of FNAC to be 86% when compared with that of histopathology sections. There were two cases of false negative diagnosis. These two cases were one each of mucoepidermoid carcinoma and basal cell carcinoma which were initially diagnosed as pleomorphic adenoma on FNAC. The other two cases with false negative diagnosis were that of adenoid cystic carcinoma which were inaccurately diagnosed on FNAC as Warthin's tumour and pleomorphic adenoma.

CONCLUSION

FNAC is a simple, rapid, accurate, painless technique, with excellent patient compliance and avoids unnecessary surgery or discomfort for the patient with acceptable diagnostic accuracy especially in the experienced hands. It has an important role in the preoperative evaluation and categorisation of various parotid gland lesions. Proper sampling of lesions and adequate cellularity of the smears are the prerequisites for an accurate diagnosis. The overall diagnostic accuracy of FNAC in this series was 86% with a sensitivity of 83% and a specificity of 94% for detecting malignancy.[3] Also, the confidence interval of sensitivity is from 87% to 101% and specificity is from 76% to 90%. This study can be used to differentiate benign from malignant lesions of parotid gland tumours which are of utmost value in planning further appropriate management of the patient.

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