



Fine-Needle Aspiration Cytology: A Reliable Tool in the Diagnosis of Salivary Gland Lesions

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Abstract Salivary gland lesions comprise for about 2–6.5% of all head and neck neoplasms in adults. They are accessible for FNAC (Fine Needle Aspiration Cytology). The risk of fistula formation and/or tumour implantation are low compared to surgical biopsy. FNAC can also provide a distinction between salivary and non-salivary lesion, benign and malignant lesions. 67 patients were studied prospectively over 5 years. FNAC was performed pre-operatively and histopathological examination post-operatively in patients who underwent surgery and were willing to participate in the study. 59.7% of the lesions were non-neoplastic and 58.2% were neoplastic (37.3% benign and 20.8% malignant). Pleomorphic adenoma was the most common benign neoplasm while mucoepidermoid and adenoid cystic carcinoma both were the most frequent malignant lesion. Among the non-neoplastic lesions, the most number of cases were of chronic sialadenitis. In our study, FNAC has a sensitivity of 94.54% specificity of 80.95% for neoplastic lesions. It was seen that FNAC was a useful diagnostic tool in the evaluation of salivary gland lesions because of its simplicity, excellent patient compliance and rapid diagnosis. This cost effective tool is invaluable in planning the surgical management of the patient.

Keywords FNAC · Salivary gland · Salivary gland tumours · Cyto-histopathology

Introduction

Salivary gland lesions form about 2–6.5% of all head and neck neoplasm in adults [1], and present as enlarged masses which are usually accessible for FNAC being comparatively superficial. They are not usually subjected to incisional or needle biopsy techniques because of the risks of fistula formation, and/or in the case of neoplasm, of tumour implantation. There is no evidence in the literature of any such complications occurring with FNAC [2]. The present study was undertaken to evaluate and analyse salivary gland lesions by FNAC and correlate the cytological findings with histopathology post-operatively.

Cytology can clearly distinguish between salivary and non-salivary lesions, benign and malignant lesions, so also specific and non-specific inflammation. Thus, it can be used as a guidance tool for the therapeutic management of the patient. FNAC is a useful tool for subtyping of salivary gland lesions with variable specificity and sensitivity.

Methods

The present study was a prospective study of salivary aspirations on 67 patients. Histopathological correlation was done whenever possible. Cases operated in the department of Otorhinolaryngology (ENT) at our tertiary hospital, over a period of 5 years (2012–2017) were included in the study. Our hospital is a tertiary care hospital and most of the patients are from the lower economic group. Detailed clinical history, results of local examination, general examinations and systematic examination were recorded in each case.

FNAC was done using 10 cc syringes and 20–22 no. needles after taking informed consent of the patient. USG

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guided FNACs were also performed in cases where it was indicated. Smears were stained with Leishman and H&E stain. Post-operatively biopsy specimen was fixed in 10% formalin. Gross and microscopic examination was performed in each case. H&E stain was done in all cases and special stains like PAS and mucicarmine were also done.

Results

In the present series, there were 34 males and 33 females. Out of 67, the maximum number of cases was in the age group of 21–30 years (25 cases, 37.3%). The parotid gland was most frequently involved (58.2% cases). There were 39 neoplastic lesions and 40 non-neoplastic lesions (Table 1). Of the 39 neoplastic lesions, 25 were benign and 14 were malignant. Pleomorphic adenoma was the most common benign neoplasm encountered. Mucoepidermoid carcinoma was the most frequent malignant neoplasm. In the non-neoplastic group, there were 18 cases of chronic sialadenitis, 21 cases of cystic lesions and 1 case of lipoma (Table 2). Correlation of salivary glands lesions over FNAC and histopathological examination is provided in Table 3.

Discussion

In the present study, the slight male preponderance which was observed was very trivial. The parotid gland was involved in 58.2% cases. This was very much comparable with other studies conducted by Sousa et al., Cristallini et al., Chatterjee et al., Cajulis et al. and Khandekar et al. in which parotid gland was involved in 57–83% cases [3–7]. There were 25 benign neoplastic cases (37.3%) which was comparable with similar studies where incidence of benign neoplasm has been reported as 40%, 61%, 69% and 41% by different authors [3, 4, 6, 7]. Twenty-one percent of our cases were malignant lesions as against 69%, 37%, 13% and 10% reported by other authors [3, 4, 6, 7]. Sixty percent of cases were non-neoplastic. In other studies, 40%

and 20% of cases have been reported as non-neoplastic [4, 7].

Out of 25 cases diagnosed as pleomorphic adenoma on histopathological examination, 25 (i.e. 100%) were correctly diagnosed by FNAC. Pleomorphic adenoma was the most common benign neoplasm (37.3%). This finding was similar to other studies in which 50%, 21.6% and 40% cases were of pleomorphic adenoma [4, 5, 7].

Mucoepidermoid carcinoma and adenoid cystic carcinoma were the most common malignant neoplasm (6 cases each). A cytologic diagnosis of mucoepidermoid carcinoma requires a background of mucus and debris and a variable population of cells [7]. Benign lesions like cysts may also contain mucous and debris and cause diagnostic problems [7]. Klijanienko observed 96% correlation for adenoid cystic carcinoma [8]. The distinction between pleomorphic adenoma and adenoid cystic carcinoma on FNAC may be difficult on account of several features—myxoid acellular material may be found in both and hyaline globules characteristic of adenoid cystic carcinoma may also be seen in pleomorphic adenoma [7]. Squamous cell carcinoma was the diagnosis in 2 cases. Most common salivary gland involving malignant neoplasm was observed to be the parotid gland.

Klijanienko observed a cyto-histopathological correlation of 81.8% for chronic sialadenitis [8]. In our study there was 90% correlation. The present study has a sensitivity of 94.54% and specificity of 80.95% for neoplastic lesions. FNAC was found to be simple, non-invasive and cost effective and rapid diagnostic tool for salivary gland lesions. It plays a key role in evaluation of salivary gland tumours thus helping further surgical management of the patient.

Even though it is an excellent diagnostic tool, FNAC has its own limitations. Results of the FNAC depend upon the experience of the person aspirating, skill of the pathologist performing the cytological interpretation and clinical history in the context of the patient. Scanty sample, high vascularity, faulty sampling technique, overlapping cytological features, few neoplasms (follicular) are certain pitfalls in FNAC.

Table 1 FNAC of salivary gland lesions

Non-neoplastic		Neoplastic			
		Benign		Malignant	
Chronic sialadenitis	18	Pleomorphic adenoma	25	Mucoepidermoid carcinoma	7
Cystic lesions	21			Adenoid cystic carcinoma	4
Others (Lipoma)	1			Squamous cell carcinoma	3
	40		25		14

Table 2 Histopathological diagnosis of salivary gland lesions

Non-neoplastic	Neoplastic				
	Benign		Malignant		
Chronic sialadenitis	18	Pleomorphic adenoma	25	Mucoepidermoid carcinoma	6
Cystic lesions	21			Adenoid cystic carcinoma	6
Others (Lipoma)	1			Squamous cell carcinoma	2
	40		25		14

Table 3 Cyto-histopathological correlation of salivary gland lesions

FNAC diagnosis	Histopathological diagnosis						
	Chronic sialadenitis	Mucoepidermoid carcinoma	Adenoid cystic carcinoma	Squamous cell carcinoma	Pleomorphic adenoma	Cystic lesions	Others (lipoma)
Pleomorphic adenoma (25)					25		
Chronic sialadenitis (18)	18						
Mucoepidermoid carcinoma (7)		6	1				
Adenoid cystic carcinoma (4)			4				
Squamous cell carcinoma (3)			1	2			
Cystic lesions (21)						21	
Others (lipoma) (1)							1
Total (67)	18	6	6	2	25	21	1

Conclusion

It was observed that FNAC is a very reliable test having high sensitivity, specificity and accuracy in diagnosing salivary gland lesions which is also a simple, safe and cost effective modality in investigation. It has excellent patient compliance and gives rapid diagnosis. This cost effective tool is invaluable in planning the surgical management of the patient.

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Declarations

Conflict of interest There are no conflicts of interest. The authors have no relevant financial or non-financial interests to disclose. The authors have no conflicts of interest to declare that are relevant to the content of this article. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial

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Ethical Approval The study was approved by the Institutional Ethics Committee of the institute. Ethical approval for the study was approved by the Institutional Ethics Committee of SMIMER, Surat, Gujarat (India).

Informed Consent Informed consents were taken from all patients participating in the study.

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