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ORIGINAL RESEARCH

Cytomorphological study of salivary gland tumor on fnac

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Abstract

Background: To study cytomorphology of salivary gland tumor on FNAC.

Materials & methods: A total of 110 patients were enrolled. All the patients with head and neck swelling referred to cytopathology department for FNAC of swelling between March 2021 to January 2022 were included. All cases were categorized cytologically in to 7 categories according to MILAN'S SYSTEM for reporting salivary gland cytopathology diagnostic category, corresponding risk of malignancy and land of treatment.

Results: Out of 110 cases, 70 cases were of salivary gland origin & out of which 40 cases were identified as neoplasm. 25(62.5%) were males & 15(37.5%) were females. The age of patients ranged from 18 to 75 years, correlating with a peak incidence in 4th decade of life. Benign tumours were more likely in younger patients (18-40 years) and malignant tumours mostly in older patients(65-75 years). 60-80% tumours were to be found in parotid gland and only 10% in sub mandibular gland.

Conclusion: FNAC is useful for the diagnosis of salivary gland lesions. FNAC with radiological study is the first line of investigation.

Keywords: salivary gland, fine needle aspiration, tumors

Introduction

Salivary gland fine-needle aspiration (FNA) cytology has become an accepted method of evaluating salivary gland tumors preoperatively. Despite the relative rarity of these tumors, there is a wealth of literature on the diagnostic performance of FNA for salivary gland tumors. In a comprehensive meta-analysis, FNA of parotid gland tumors was shown to have a high specificity in differentiating benign and malignant lesions (97%) and in differentiating nonneoplastic from neoplastic lesions (98%).[1] Thus, FNA of salivary gland tumors has the potential to limit the need for surgery in nonneoplastic lesions that can often be followed clinically. [2] Indeed, a separate meta-analysis suggested that inclusion of salivary gland FNA in clinical decision making can reduce the overall cost of treating salivary gland tumors. [2] In addition, FNA can be used complementarily with intraoperative frozen section to help define the extent of initial surgery.[3,4]

Fine-needle aspiration cytology (FNAC) is widely accepted tool for preoperative diagnosis and management of suspected salivary gland tumors. [5,6] Cytology can clearly distinguish between salivary and non salivary lesions, benign and malignant lesions, so also specific and nonspecific inflammation.[7] The characteristic cytologic features of the common salivary

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gland lesions are well-delineated in literature. However, there also exist cytologic pitfalls and overlapping features that make an accurate diagnosis difficult in few cases. This has led to a wide-range of sensitivity (62-97.6%) and specificity (94.3-100%) of cytologic diagnosis. [8,9] The reported diagnostic accuracy is high for benign neoplasms, but lower for malignant tumors. The accuracy of type-specific diagnosis of malignant salivary gland tumors is quite poor, as reported in the literature.[9-11] Hence, this study was conducted to study cytomorphology of salivary gland tumor on FNAC.

Materials & methods

A total of 110 patients were enrolled. All the patients with head and neck swelling referred to cytopathology department for FNAC of swelling between March 2021 to January 2022 were included.The clinical data collected including age, sex, localization of swelling & clinical presentation. All cases were categorized cytologically in to 7 categories according to MILAN'S SYSTEM for reporting salivary gland cytopathology diagnostic category, corresponding risk of malignancy and land of treatment. The categories were:

1. Non diagnostic
2. Non neoplastic
3. Atypia of undetermined significance
4. Benign
5. Salivary gland neoplasm of uncertain malignant potential
6. Suspicious for malignancy
7. Malignant

In this study tumors are categorized according to age ,sex ,anatomical localization and tumor type (benign or malignant). The data collected was analysed statistically in SPS software trial version 21.

Results

Out of 110 cases, 70 cases were of salivary gland origin & out of which 40 cases were identified as neoplasm. 25(62.5%) were males & 15(37.5%) were females. The age of patients ranged from 18 to 75 years, correlating with a peak incidence in 4th decade of life. Benign tumours were more likely in younger patients (18-40 years) and malignant tumours mostly in older patients(65-75 years). 60-80% tumours were to be found in parotid gland and only 10% in submandibular gland. Sublingual gland tumours were rare and most malignant tumours were sublingual gland tumours. Minor salivary gland tumours were found in 24-40% cases. Pleomorphic adenoma was most common benign tumour. The three prevalent malignant salivary gland tumours are mucoepidermoid carcinoma, adenoid cystic carcinoma and acinic cell carcinoma.

Table 1: Distribution of tumors in different age group and sex

Age group (years)	Male	Female	Total
18-25	8	3	11 (27.5%)
26-35	2	1	3 (7.5%)
36-45	10	7	17 (42.5%)
46-55	2	1	3 (7.5%)
56-65	1	1	2 (5%)
66-75	2	2	4 (10%)
Total	25 (62.5%)	15 (37.5%)	40

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Table 2: Distribution of sites of tumor

Anatomical region	No. of cases	Percentage
Parotid gland	26	65
Submandibular gland	4	10
Sublingual gland	1	2.5
Minor salivary glands	9	22.5
Total	40	100

Table 3: Cases diagnosed on FNAC

Benign tumors	Number of cases	Percentage
Pleomorphic adenoma	24	60
Warthin tumor	8	20
Myoepithelioma	1	2.5
Basal cell adenoma	1	2.5
Total	34	85

Table 4: Number of cases of different types of malignant tumors

Malignant tumors	Number of cases	Percentage
Mucoepidermoid carcinoma	3	7.5
Adenoid cystic carcinoma	2	5
Acinic cell carcinoma	1	2.5
Total	6	15

Discussion

FNAC is a widely used, safe and less traumatic diagnostic procedure capable of providing important information to the treating physician. In salivary gland masses, FNAC serves to determine the nature of the lesion (inflammatory/neoplastic – benign or malignant) and in some cases, the specific diagnosis. Though the management of almost all neoplastic salivary gland lesions is surgical excision, a pre-operative diagnosis of benign or malignant assists the clinician in planning the extent of surgery.[12] However, FNAC of salivary gland lesions often poses a diagnostic problem since various pathologic processes exhibit diverse and somewhat overlapping cytologic features. Hence, this study was conducted to study cytomorphology of salivary gland tumor on FNAC.

In the present study, out of 110 cases, 70 cases were of salivary gland origin & out of which 40 cases were identified as neoplasm. 25(62.5%) were males & 15(37.5%) were females. The age of patients ranged from 18 to 75 years, correlating with a peak incidence in 4th decade of life. Benign tumours were more likely in younger patients (18-40 years) and malignant tumours mostly in older patients (65-75 years). 60-80% tumours were to be found in parotid gland and only 10% in submandibular gland. A study by Jain R et al, included 80 patients who underwent pre-operative FNAC followed by surgical procedure and histologic examination. FNAC diagnosis was compared with the final histologic impression and concordance assessed. Of the 80 cases, majority (67.5%) involved the parotid gland. Eight cases (10%) were non-neoplastic lesions, comprised of sialadenitis, retention cyst and sialadenosis. Of a total of 72 neoplasms, 58 were benign and 14 were malignant salivary gland tumors. A cyto-histologic concordance of benign diagnosis was achieved in 85.7% of cases and for malignant lesions in 92.8% of the malignant tumors. FNAC showed a sensitivity of 92.8%, specificity of 93.9%, a positive predictive value of 81.2% and negative predictive value of 98.4% for malignant salivary gland tumors. There was one false-negative diagnosis and four false-positive cases diagnosed on FNAC. [13]

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In the present study, sublingual gland tumours were rare and most malignant tumours were sublingual gland tumours. Minor salivary gland tumours were found in 24-40% cases. Pleomorphic adenoma was most common benign tumour. The three prevalent malignant salivary gland tumours are mucoepidermoid carcinoma, adenoid cystic carcinoma and acinic cell carcinoma. Another study by Mukundapai M et al, included 4 years (2011–2015) retrospective data retrieval from cytology department of our Institute, which is a tertiary care cancer center of South India. Histopathology correlation was done wherever possible. Total 253 cases were studied. Histopathological follow-up was available in 115 cases. Cases were categorized as nondiagnostic (1.58%), nonneoplastic (13.43%), benign (30%), atypia (0.8%), and suspicious for malignancy and malignant cytology (51.8%). The risk for malignancy was high for suspicious for malignancy and malignant cytological categories ranged from 96–100%. [14] Among the malignant salivary gland neoplasms, mucoepidermoid carcinoma shows mucus producing and intermediate cells in a dirty mucoid background with varying degree of atypia depending on the grade of the tumor. [15] The differential diagnoses include squamous cell carcinoma, both primary as well as metastatic or contiguous involvement from cutaneous or intra-oral location. The distinction from metastatic carcinoma requires clinical and imaging data suggesting the involvement of intraparotid or submandibular lymph node.[16] Acinic cell carcinoma, on cytology, shows acinic cells with vacuolated cytoplasm and anisonucleosis and bare nuclei in the background.[17] Various studies have reported the characteristic cytologic features of ACC as tight clusters of hyperchromatic epithelial cells with hyaline globules having a smooth sharp border.[18]

Conclusion

FNAC is useful for the diagnosis of salivary gland lesions. FNAC with radiological study is the first line of investigation.

References

1. Schmidt RL, Hall BJ, Wilson AR, et al. A systematic review and meta-analysis of the diagnostic accuracy of fine-needle aspiration cytology for parotid gland lesions. Am J Clin Pathol. 2011; 136:45–59.
2. Layfield LJ, Gopez E, Hirschowitz S. Cost efficiency analysis for fine-needle aspiration in the workup of parotid and submandibular gland nodules. Diagn Cytopathol. 2006; 34:734–738.
3. Schmidt RL, Hunt JP, Hall BJ, et al. A systematic review and meta-analysis of the diagnostic accuracy of frozen section for parotid gland lesions. Am J Clin Pathol. 2011; 136:729–738.
4. Seethala RR, LiVolsi VA, Baloch ZW. Relative accuracy of fine-needle aspiration and frozen section in the diagnosis of lesions of the parotid gland. Head Neck. 2005; 27:217–223.
5. Kotwal M, Gaikwad S, Patil R, Munshi M, Bobhate S. FNAC of salivary gland – A useful tool in preoperative diagnosis or a cytopathologist's riddle. J Cytol. 2007; 24:85–8.
6. Verma K, Kapila K. Role of fine needle aspiration cytology in diagnosis of pleomorphic adenomas. Cytopathology. 2002; 13:121–7.
7. Khandekar MM, Kavatkar AN, Patankar SA, Bagwan IB, Puranik SC, Deshmukh SD. FNAC of salivary gland lesions with histopathological correlation. Indian J Otolaryngol Head Neck Surg. 2006;58:246–8
8. Kocjan G, Nayagam M, Harris M. Fine needle aspiration cytology of salivary gland lesions: Advantages and pitfalls. Cytopathology. 1990; 1:269–75.
9. Qizilbash AH, Sianos J, Young JE, Archibald SD. Fine needle aspiration biopsy cytology of major salivary glands. Acta Cytol. 1985; 29:503–12.

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10. Zurrida S, Alasio L, Tradati N, Bartoli C, Chiesa F, Pilotti S. Fine-needle aspiration of parotid masses. Cancer. 1993; 72:2306–11.
11. Mihashi H, Kawahara A, Kage M, Kojiro M, Nakashima T, Umeno H, et al. Comparison of preoperative fine-needle aspiration cytology diagnosis and histopathological diagnosis of salivary gland tumors. Kurume Med J. 2006; 53:23–7.
12. Rajwanshi A, Gupta K, Gupta N, Shukla R, Srinivasan R, Nijhawan R, et al. Fine-needle aspiration cytology of salivary glands: Diagnostic pitfalls – Revisited. Diagn Cytopathol. 2006; 34:580–4.
13. Jain R, Gupta R, Kudesia M, Singh S. Fine needle aspiration cytology in diagnosis of salivary gland lesions: A study with histologic comparison. Cytojournal. 2013 Jan 31;10:5
14. Mukundapai M, Sharma N, Patil A, Gopal C. Fine-Needle Aspiration Cytology of Salivary Gland Lesions: A Revised Classification Based on "Milan System"-4years Experience of Tertiary Care Cancer Center of South India. J Cytol. 2020 Jan-Mar; 37(1):12-17.
15. Klijanienko J, Vielh P. Fine-needle sampling of salivary gland lesions. IV. Review of 50 cases of mucoepidermoid carcinoma with histologic correlation. Diagn Cytopathol. 1997; 17:92–8.
16. Mukunyadzi P. Review of fine-needle aspiration cytology of salivary gland neoplasms, with emphasis on differential diagnosis. Am J Clin Pathol. 2002; 118:S100–15.
17. Klijanienko J, Vielh P. Fine-needle sample of salivary gland lesions. V: Cytology of 22 cases of acinic cell carcinoma with histologic correlation. DiagnCytopathol. 1997; 17:347–52
18. Klijanienko J, Vielh P. Fine-needle sampling of salivary gland lesions. III. Cytologic and histologic correlation of 75 cases of adenoid cystic carcinoma: Review and experience at the Institute Curie with emphasis on cytologic pitfalls. Diagn Cytopathol. 1997;17:36–41