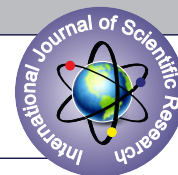


DIAGNOSTIC APPROACH TO ONCOCYTOID LESIONS IN SALIVARY GLAND CYTOLOGY: FOCUS ON DIFFERENTIAL DIAGNOSIS AND POTENTIAL DIAGNOSTIC CHALLENGES- STUDY FROM TERTIARY CARE HOSPITAL OF WESTERN INDIA



Pathology

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ABSTRACT

Introduction: To Assess oncocytic and oncocytoid lesions within the salivary glands, The discussion centers on the diagnosis of oncocytic and oncocytoid lesions with various cytomorphological features. **Methods:** This study is six year retrospective study in which salivary gland aspiration cytology cases having oncocytic cells and with available corresponding histopathology were included. These slides were reviewed for features like cellularity, presence of oncocytic cells, glandular elements, squamoid cells, nuclear atypia, mitosis, lymphoid tissue, necrosis. Twenty cases were included in the study. **Results:** A total of 120 salivary gland cytology cases, over a period of six years (2017-2022) were reviewed. 20 cases with a corresponding histopathology diagnosis were included in the study. A concordant benign and malignant diagnosis was seen in 15(75%) cases. Five cases (25%) with a benign cytological diagnosis were proved malignant on histological examination of the resected specimen. **Conclusion:** The presence of oncocytes in cytology smears of salivary gland lesions poses a significant diagnostic challenge. Awareness of the full spectrum of conditions in which these cells occur is essential for achieving an accurate cytological diagnosis.

KEYWORDS

Warthin tumor, Oncocytoid, histopathology, Mucoepidermoid carcinoma.

INTRODUCTION

Salivary gland tumors (SGTs) make up less than 5% of all head and neck tumors^[1] These tumors may display benign, low-grade, or high-grade malignant behavior. Notably, different tumor types can share overlapping morphological features, while a single tumor may demonstrate striking morphological variability.^[2]

The present article focuses on the assessment of oncocytic and oncocytoid lesions within the salivary glands. The presence of oncocytes in salivary glands presents a diagnostic challenge, as they can occur in a wide spectrum of lesions, ranging from non-neoplastic and benign to malignant. Fine-needle aspiration cytology (FNAC) serves as a simple yet valuable tool in the preoperative evaluation and diagnosis of these lesions^[3]

Oncocytic cells are characterized by moderate to abundant eosinophilic, finely granular cytoplasm, round to oval nuclei, and prominent nucleoli. Conversely, the term *oncocytoid* refers to tumor cells with similarly abundant, and occasionally granular, cytoplasm but lacking all the definitive features typical of true oncocytes.^[3]

AIM AND OBJECTIVE:

To provide accuracy of Oncocytoid lesions diagnosis in aspirate specimens. Employing these diagnostic criteria facilitates the consideration of significant differential diagnoses-encompassing both benign and malignant conditions-when evaluating oncocytic salivary gland neoplasms.

MATERIALS AND METHODS

In this study, Retrospective analysis of 120 specimens of salivary gland were received in cytopathological department during January 2017 to December 2022 was done. This study is six year retrospective study in which 20 salivary gland aspiration cytology cases with histopathology having oncocytic cells were included. The Papanicolaou, May Grunwald Giemsa and H&E-stained slides of these cases were reviewed for features like cellularity, presence of oncocytic cells, glandular elements, squamoid cells, nuclear atypia, mitosis, lymphoid tissue, and necrosis.

RESULTS

A total of 120 salivary gland cytology cases, over a period of six years (2017-2022) were reviewed. 20 cases with a corresponding histopathology diagnosis were included in the study.

The age at presentation ranged from 30 to 65 years . Males are more affected than females. The most affected gland was parotid gland in 80% cases. A concordant benign and malignant diagnosis was seen in 15(75%) cases. Five cases (25%) with a benign cytological diagnosis were proved malignant on histological examination of the resected specimen.

Table-1: Cytological Features Of Concordant Cases

Concordant cases(n)	Warthin tumor (12)	Oncocytoma (2)	Papillary cyst Adenocarcinoma
Oncocytic cells	12	2	1
Squamoid cells	0	0	0
Glandular cells	1	0	1
Nuclear Pleomorphism	0	0	1
Mitosis	0	0	1
Lymphocytes	12	0	0
Cyst Macrophages	6	1	1
Necrosis	3	1	1
Hemorrhage	5	1	0
Proteinaceous	4	1	1
Other	-	-	Papillary features
Total	12	02	01

Table-1 shows most common presentation of warthin tumor is oncocytic cells and presence of lymphocytes. While adenocarcinoma can be present with cyst macrophages, necrosis and proteinaceous background. Benign Oncocytoma also can have necrosis and hemorrhage.

Table-2: Cytological Features Of Discordant Cases

Discordant cases(n) – Total 5 cases	Cytological Diagnosis	Histologic Diagnosis	Oncocytic cells	Squamoid cells	Nuclear pleomorphism, nucleoli, mitosis	Lymphocytes + Background
1	Warthin tumor	Low grade Mucoepidermoid carcinoma	Present	Small foci	occasional	Present with Hemorrhagic background
2	Benign Oncocytic lesion	Low grade Mucoepidermoid carcinoma	Present	Occasional	occasional	Absent with Hemorrhagic background
3	Oncocytoma	Oncocytic carcinoma	Present	Absent	Focal nuclear atypia present with occasional mitosis	Absent with proteinaceous background

4	Atypical Oncocytic Lesion	Secretory Carcinoma	Present	Absent	Cells with granular cytoplasm with occasional nucleoli present	Absent with proteinaceous background
5	Atypical Oncocytic Lesion	Salivary duct carcinoma	Present	Focal	Focal nuclear atypia with occasional mitosis	Absent with Hemorrhagic background

TABLE-2 shows discordant between cytological and histological cases. Main reason could be limitation of FNAC, as it expose limited area, while Histology provide vast structural exposure.

DISCUSSION

Tumors primarily exhibiting oncocytic differentiation include oncocytoma and Warthin tumor. Additionally, other tumors such as mucoepidermoid carcinoma, acinic cell carcinoma and, on rare occasions, salivary duct carcinoma and secretory carcinoma, may also demonstrate oncocytic differentiation.^[4]

Warthin tumor (WT) represents the second most common benign neoplasm of the salivary glands. It predominantly arises in the parotid gland and periparotid lymph nodes.^[5,6] Smoking exhibits a strong etiological association and may induce metaplastic changes in the parotid duct epithelium. Cytologically, WT is characterized by oncocytic cells arranged in sheets and papillary fragments, along with lymphocytes, cystic macrophages, and a necrotic background. However, variations in the relative predominance of these components can complicate diagnosis.^[7] In the present study, a lymphoid component was observed in all cytologically diagnosed cases of WT.

The identification of squamoid cells warrants careful consideration, as squamous metaplasia is a commonly observed feature in Warthin tumor (WT).^[8]

Low-grade mucoepidermoid carcinoma presents a diagnostic challenge due to overlapping cytological features such as cystic changes, the presence of squamous cells, bland cytological characteristics, lymphocytes, and occasional oncocytes. In such instances, careful evaluation for epidermoid cells, intermediate cells, goblet cells, and background mucin is essential.^[9] In the present series, review of discordant case revealed occasional clusters of squamoid cells exhibiting nuclear dysplasia. This finding may suggest a low-grade malignancy; however, it could also represent a reparative change. Therefore, caution is warranted when interpreting such isolated features.^[7,9]

Oncocytoma is an uncommon benign salivary gland tumor characterized cytologically by cohesive sheets of oncocytic cells, typically within a clear background devoid of lymphocytes. This cytomorphological pattern may overlap with various non-neoplastic and neoplastic conditions.^[6]

Malignant entities exhibiting oncocytic cytology include oncocytic carcinoma, acinic cell carcinoma, the oncocytic variant of mucoepidermoid carcinoma, and salivary duct carcinoma. Most high-grade malignancies can be distinguished cytologically by the presence of nuclear atypia, increased mitotic activity, and a necrotic background.^[8,10]

Similar study by Prabhakar P^[11] showing A total of 574 salivary gland cytology cases, over a period of eight years (2013–2020) were reviewed. Out Of these, 20 cases with a corresponding histopathology diagnosis were included in the study. The study showing similar result as our study. The most affected gland was parotid in 80% cases. A concordant benign and malignant diagnosis was seen in 16 (80%) cases. Four (20%) cases with a benign cytological diagnosis were proved malignant on histopathological examination of the resected specimen. One case showing cytological diagnosis of benign oncocytic lesion while same case having histological diagnosis of acinic cell carcinoma. Another 3 cases diagnosed as warthin tumor on

cytology diagnosed on histology as mucoepidermoid carcinoma, Metastatic squamous cell carcinoma and Intraparotid lymphnode respectively.^[11]

Another similar study by Özakkoynlu Hasçiçek S^[12] showing salivary gland oncocytic lesions diagnosed in 2016-2017 ,Nineteen cases were benign, two cases were malignant. Eighteen of the benign lesions were Warthin tumour (WT), one case was oncocytoma with nodular oncocytic hyperplasia. Acinic cell carcinoma (AciCCA) with oncocytic cells predominant was one of the malignant cases. The other case was high-grade salivary duct carcinoma (SDCA).

Thus similar studies showing almost similar results as our study.

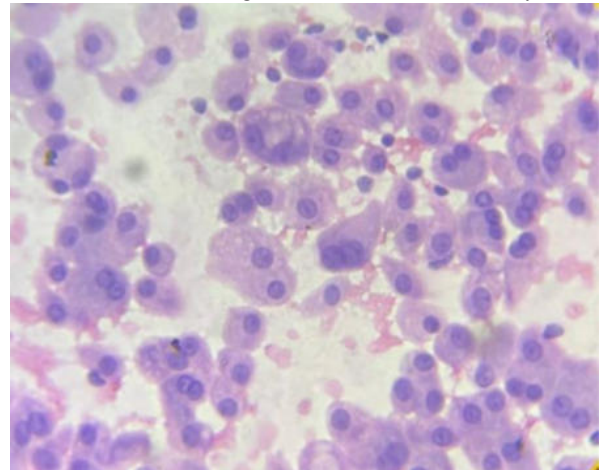


Figure-1: Oncocytoma -Cytology of The cellular smears show oncocytoid cells with abundant eosinophilic, finely granular cytoplasm, round to oval nuclei, and prominent nucleoli. (40x ,H & E stain)

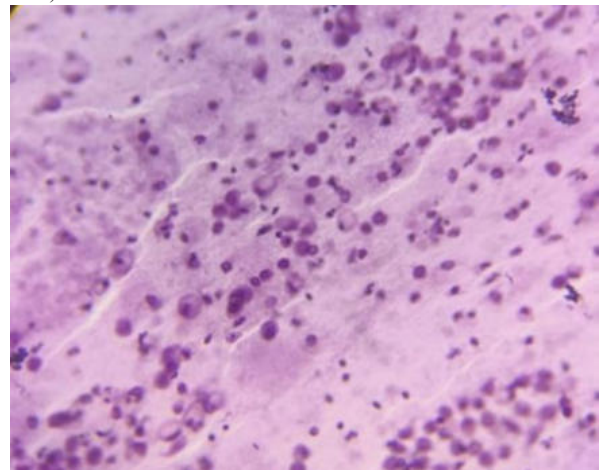


Figure 2- Histology of Mucoepidermoid Carcinoma – The smears show mucinophages, intermediate cells with necrotic background (10x ,H & E stain)

CONCLUSION

The presence of oncocytes in cytology smears of salivary gland lesions poses a significant diagnostic challenge. Awareness of the full spectrum of conditions in which these cells occur is essential for achieving an accurate cytological diagnosis. Meticulous examination of smears for subtle diagnostic clues, as discussed above, can help reduce interpretative errors and contribute to appropriate patient management. Also implementation of Milan system for reporting cytology can be helpful. It has categories like atypia, salivary gland neoplasm of uncertain malignant potential and suspicious of malignancy. It helps to avoid confirmatory diagnosis in case of doubtful cytology cases.

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