

Salivary gland neoplasms: Histomorphological assessment of an enigmatic group of tumoursPreeti Sharma^{1*}, Vidya Jha², Ashish Kumar Mandal³¹Resident, Department of Pathology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India²Senior Resident, Department of Pathology, VardhmanMahavir Medical College and Safdarjung Hospital, New Delhi, India³H.O.D & Director Professor, Department of Pathology, VardhmanMahavir Medical College and Safdarjung Hospital, New Delhi, India**ABSTRACT**

Introduction: Salivary gland tumours are complex and exhibit varied clinico-pathological features. These tumours are particularly important to the otolaryngologists, head and neck surgeons and oncologists because of their associated morbidity and mortality. **Material and methods:** The archives of department of histopathology were retrospectively reviewed from January 2011 to January 2016. All cases of salivary gland neoplasms were included in this study. Clinical details were obtained from the medical records. Diagnosis was confirmed on hematoxylin and eosin (H&E) stained formalin fixed paraffin embedded sections from excised specimens. **Results:** 235 patients with salivary gland tumours were included in the study. The mean patient age at the time of presentation was 45.5 years (range 17-79 years). There were 90 males and 145 females with a male: female ratio of 1:1.6. Parotid gland was most commonly involved (76%) followed by the submandibular gland (22%) and minor salivary glands (2%). Benign tumours (74.4%) exceeded malignant tumours of salivary glands (25.6%). The most common benign salivary gland neoplasm was pleomorphic adenoma (155 cases), followed by 10 cases of Warthin's tumour, 5 cases of basal cell adenoma, 2 cases of myoepithelioma and schwannoma each and a single case of oncocytoma. Adenoid cystic carcinoma was the most frequently reported malignant tumour of the salivary glands (29 cases), followed by 19 cases of muco-epidermoid carcinoma, 2 cases of salivary duct carcinoma, 3 cases each of carcinoma-ex-pleomorphic adenoma, and a single case each of acinic cell carcinoma, carcinosarcoma, osteosarcoma and giant cell tumour of salivary gland. **Conclusion:** Benign tumours are more common than malignant tumours in the salivary glands. Histomorphological assessment is imperative prior to therapeutic intervention. Unusual entities like nerve sheath tumour, osteosarcoma, carcinosarcoma and giant cell tumour must be kept in mind as a differential diagnosis by the clinicians and pathologists.

Key words: histopathology; neoplasm; salivary gland; tumour**Introduction**

Salivary glands comprise a mixed bag of non-neoplastic and neoplastic lesions with the latter accounting for 3% of head and neck neoplasms.[1] Around 64%-80% of all primary epithelial salivary gland tumours occur in the parotid gland with localisation in the superficial lobe being

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more common. While benign tumours are more frequently observed in parotid gland comprising 54-79% of tumours, the incidence of malignancy rises to 40% in submandibular gland and 90% in case of sublingual glands. Salivary gland tumours are particularly important to the otolaryngologists, head and neck surgeons and oncologists because of their associated morbidity and mortality, and more so because vital head and neck structures like the facial nerve transverse these glands. Owing to rather non-

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specific clinico-radiological features of salivary gland neoplasms, histomorphological assessment is imperative prior to therapeutic intervention. However, a varied spectrum of histomorphological diversity, hybrid tumours, dedifferentiation and malignant transformation of benign tumours are prominent confounding factors in histopathological interpretation. [2] Keeping in view these considerations, we retrospectively analysed the cases of salivary gland tumours diagnosed on histopathology over a period of five years in a tertiary care setting. Our study highlights the clinico-pathological features of salivary gland tumours with special emphasis on the histomorphology.

Material and methods

The archives of department of histopathology were retrospectively reviewed over a period of five years from January 2011 to January 2016. Of the 64,077 cases received in our department, cases of salivary gland neoplasms were included in this study. Clinical details including detailed history, physical examination and results of routine blood investigations were obtained from the medical records. Following surgical excision, the excised specimen was fixed in 10% neutral buffered formalin and sent for histopathological evaluation. Diagnosis was confirmed on hematoxylin and eosin (H&E) stained formalin fixed paraffin

embedded sections. The H&E stained sections were reviewed by two pathologists and correlated with the clinical findings.

Results

Of the 64,077 cases received in our department, 235 patients with salivary gland tumours were included in the study. The mean patient age at the time of presentation was 45.5 years (range 17-79 years). There were 90 males and 145 females with a male: female ratio of 1:1.6. Among these, majority cases were localised in the parotid gland (76%) followed by the submandibular gland (22%) and minor salivary glands (2%). The most common minor salivary gland affected was the sublingual gland. The tumour size ranged between 30 cm being the largest and smallest measuring 2 cm. Retrospective analysis of the clinical findings of these patients was done. The most common presenting complaint was a swelling seen in all of the patients (100%) associated with pain in a subset of patients (22.6%). Routine blood investigations were normal in all patients except three cases of salivary gland tumours with co-existing tubercular cervical lymphadenitis having raised erythrocyte sedimentation rate (ESR). The histopathological diagnosis of salivary gland tumours is described in Table 1.

Table 1: Histopathological categorization of 235 primary salivary gland tumours

Tumour	Number of cases
BENIGN	175 (74.4%)
Pleomorphic adenoma	155
Basal cell adenoma	5
Warthin's tumour	10
Myoepithelioma	2
Oncocytoma	1
Schwannoma	2
MALIGNANT	60 (25.6%)
Adenoid cystic carcinoma	29
Muco-epidermoid carcinoma	19
Carcinoma-ex pleomorphic adenoma	3
Polymorphous low-grade adenocarcinoma	3
Salivary duct carcinoma	2
Acinic cell carcinoma	1
Carcinosarcoma	1
Primary osteosarcoma	1
Primary giant cell tumour	1

Benign tumours (74.4%) exceeded malignant tumours of salivary glands (25.6%). The most common benign salivary gland neoplasm was pleomorphic adenoma (155 cases) (Figure 1), followed by 10 cases of Warthin's tumour, 5 cases of basal cell adenoma, 2 cases of myoepithelioma and schwannoma each (Figure 2) and a single case of oncocytoma.

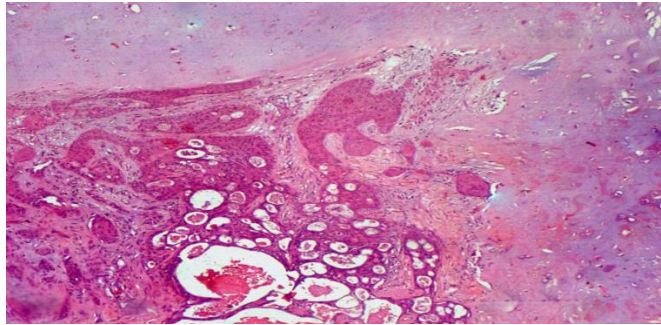


Fig 1: Photomicrograph of pleomorphic adenoma showing epithelial component as ducts, clusters and cords of cells, and mesenchymal component as chondromyxoid stroma (H&E x100)

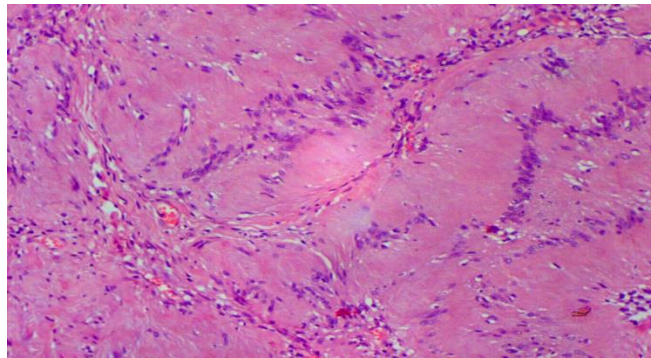


Fig 2: Photomicrograph of intra-parotid schwannoma showing presence of Verocay bodies (H&E x400)

Amongst the malignant cases, adenoid cystic carcinoma (Figure 3) was the most frequently reported malignant tumour of the salivary glands (29 cases), followed by 19 cases of muco-epidermoid carcinoma (Figure 4), 2 cases of salivary duct carcinoma, 3 cases each of carcinoma-ex pleomorphic adenoma, and a single case each of acinic cell carcinoma, carcinosarcoma, osteosarcoma (Figure 5) and giant cell tumour of salivary gland.

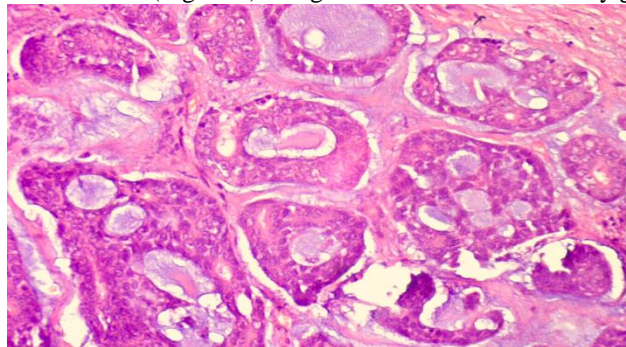


Fig 3: Photomicrograph of adenoid cystic carcinoma showing cribriform pattern and pseudocysts with basophilic basement membrane like material (H&E x400)

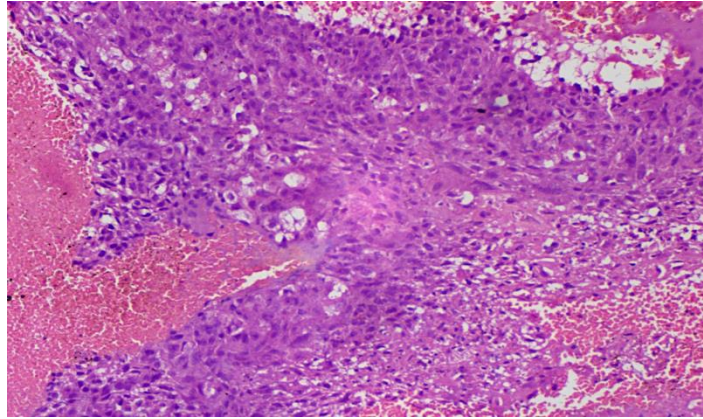


Fig 4: Photomicrograph of mucoepidermoid carcinoma showing epidermoid cells intermixed with clear looking mucin containing cells (H&E x200)

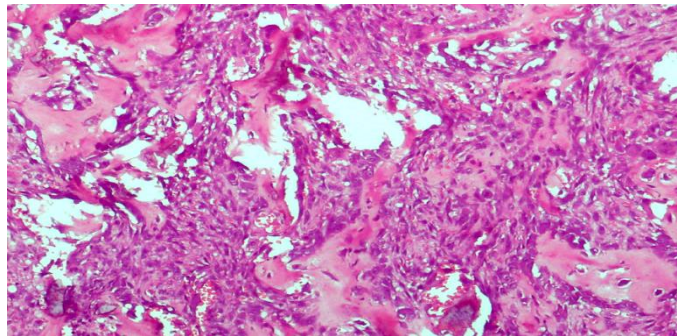


Fig 5: Photomicrograph of primary osteosarcoma of the parotid gland showing presence of bizarre tumour cells laying down eosinophilic, glassy, lace-like osteoid (H&E x200)

Discussion

Salivary gland tumours are relatively uncommon lesions with a global incidence of 0.4-13.5 cases per 100,000 populations. [3] Only a limited number of Indian studies are published on salivary gland tumours until now. Thus the epidemiology of salivary gland tumours is not well documented. In the present study during five year duration, only 237 salivary gland tumours were identified out of 64,077 specimens received. The peak incidence of these tumours was seen in the 4th decade which is similar to the other studies in the Asian subcontinent. [4-7] The most common salivary gland involved was the parotid gland. While pleomorphic adenoma was the most frequently encountered benign tumour, adenoid cystic carcinoma was the most common malignant salivary gland tumour. Our findings were in concordance with the previous literature. [8-11] Borrowing from literature, as a general rule most of the tumours of major salivary glands are benign and the tumours of minor salivary glands are malignant. Furthermore, there was an

inverse relation between the size of salivary glands and the rate of malignancy except for carcinoma ex pleomorphic adenoma where the tumour size and duration was more and the malignancy occurs in major salivary glands. [12] Pre-operative diagnosis of salivary gland tumours is imperative prior to therapeutic intervention. Investigations such as fine needle aspiration cytology (FNAC) and magnetic resonance imaging (MRI) scans provide useful information in some cases. However due to non-specific clinico-radiological features, surgical excision and histomorphological assessment is essential for a decisive diagnosis. Benign tumours and early low-grade malignancies can be treated with surgery alone, while surgery followed by postoperative radiotherapy is required for more advanced and high-grade tumours with regional lymph node metastasis. [3] Amongst the rare cases encountered in our study were schwannoma, carcinosarcoma, primary osteosarcoma and primary giant cell tumour. All of these rare entities were

encountered in the parotid salivary gland. The rarity of these cases in our study is comparable to their general global low incidence. Schwannoma arising in a salivary gland is a rare event with very few cases reported in English literature. Around 170 cases of intraparotid schwannoma have been described of which only 23 cases were accurately diagnosed on preoperative evaluation by FNAC (15 cases) and/ or radiology (8 cases). [13,14] Clinico-radiologically schwannoma is known to masquerade benign salivary gland tumours like pleomorphic adenoma and Warthin's tumour. The radiological characteristics of this tumour are variable and therefore, the preoperative diagnosis of schwannoma within salivary gland is challenging. Surgeon must carefully look for a close association of the tumour with the nerve intra-operatively and try to preserve it. Foci of osteosarcomatous differentiation in a carcinosarcoma is an infrequent yet well-established entity. On the contrary pure primary osteosarcoma of the parotid gland is exceedingly rare with only eight cases reported earlier. [15-18] We encountered a single case of carcinosarcoma as well as an exceedingly case of primary osteosarcoma of the parotid gland. Another unusual case encountered was a primary osteoclast-like giant cell tumour of the parotid gland. This entity has been rarely described in extraskelatal sites with only 24 cases involving the salivary glands reported in literature. [19] This is an aggressive neoplasm which requires prompt diagnosis for early surgical intervention and better outcome. To conclude, salivary gland tumours are unusual neoplasms which often present as painless enlarging masses. Most are located in the parotid glands and are benign in nature. The principal hurdle in their management lies in the difficulty indistinguishing benign from malignant tumours. This distinction is of utmost importance owing to different therapeutic interventions. Furthermore, unusual entities like nerve sheath tumour, osteosarcoma, carcinosarcoma and giant cell tumours must be kept in mind as a differential diagnosis by the clinicians and pathologists.

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