Original Article

Histopathological Spectrum of Malignant Jaw Tumors Diagnosed at Armed Forces Institute of Pathology

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Objective: Histopathological analysis of malignant jaw tumours
Study Design:
Place and Duration of the Study: The study was carried out in the Histopathology department of A.F.I.P Rawalpindi.
Materials and Methods: A total of 240 patients with malignant jaw tumours diagnosed during Jan 2006 to Dec 2010 were retrieved from AFIP tumour registry. Data regarding age, site, sex and Histopathological diagnosis was retrieved from the request forms. The slides were retrieved and the morphological features were studied. The data analysis was performed using SPSS version 16.
Results:A total of 240 cases were included, 146 were male and 94 were female patients. Male pre-dominance was seen with male to female ratio 1.5 to 1. The age range varied from 3 to 90 years. Mandible was involved in 132 cases (55%) followed by 108 cases in maxilla (45%). The commonest malignant tumour involving the jaw was Squamous cell carcinoma with 168 cases followed by 30 cases of malignant salivary gland tumours.
Conclusion: According to this study it is concluded that Squamous cell carcinoma is the most common malignant jaw tumour followed by malignant salivary gland tumours. The age range is wide and a male pre-dominance is observed. Mandible is the most commonly affected site.
Keywords: Malignant jaw tumours, Maxilla, Mandible, Squamous cell carcinoma

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Introduction

The oro-facial region including the jawbones and related tissues can be the site of a multitude of neoplastic conditions.[1] The tumours affecting the lower face are common whilst those affecting the mid face are relatively uncommon.[2] These tumours can be either malignant or benign. Malignant tumours of the mandible and maxilla are grouped into primary tumours that originate within the jaw bones and secondary lesions, predominantly oral cancers and metastatic lesions that involve the jaw bones secondarily.[3] Malignant lesions usually found in the lower face include sarcomas of soft and hard connective tissue, carcinomas of the salivary glands, with squamous cell carcinoma (SCC) accounting for more than 90% of reported malignant tumours of the oral cavity. Malignant melanoma and metastatic tumours from various distant sites such as the breast, lungs, abdominal organs or even the prostate gland can involve the jaw bones.[1,4]

Squamous cell carcinoma is the most common malignancy affecting the oral cavity.[1,2,3] It commonly involved the floor of the mouth and gingiva and invades the jaw bones secondarily. According to the available literature quite a large percentage of patients who present with SCC are tobacco or alcohol users.[5] Mostly malignant salivary gland neoplasms involve the jaws secondarily. Mandible is more frequently affected and most studies reveal that the occurrence of salivary gland tumours is slightly higher in females.[6] Mucoepidermoid carcinoma (MEC) is the most common malignant salivary gland tumour with a widely diverse biologic behaviour.[7] Adenoid cystic carcinoma (ACC), Polymorphous low-grade adenocarcinoma (PLGA), Epithelial-myoepithelial carcinoma and salivary duct carcinoma are some other high-grade malignancies that involve the jaws.

Sarcomas of head and neck are rare tumors accounting for 4-10 % of all sarcomas and those of oral and maxillofacial region are even rarer.[8] Osteosarcoma, rhabdomyosarcoma, malignant fibrous histiocytoma

(MFH), and angiosarcoma are the most common types of sarcomas involving the head and neck region.[9] Oropharyngeal lymphomas are uncommon but most frequently arise in Waldayer's ring, which is the second most common site of extra-nodal lymphomas.[10] Non Hodgkin lymphomas can affect both bony and soft oral tissues, with palate and mandible the most frequently affected sites.[11] The vast majority of lymphomas of this region are of the "B" cell lineage. Diffuse large B-cell lymphoma (DLBCL) comprises 60 % of the cases in this region.[12] Malignant melanoma arising from the mucosa of the head and neck region is a rare entity, accounting for approximately 0.2% of all melanomas.[13] Palate and gingiva are high-risk sites which secondarily invade maxilla and mandible.

There are limited local studies on malignant jaw tumours in literature. Armed force institute of pathology, Rawalpindi receives histopathology samples from all over the country. The aim of this study is to analyze the tumours which primarily or secondarily involve either of the jaws and to find out differences regarding age, sex and type of tumour by comparing the results with national and international data. It is envisaged that the results presented will add to the information about the jaw tumours particularly in this region of the world.

Materials and Methods

The study was carried out in the Histopathology Department of A.F.I.P, Rawalpindi. All histologically diagnosed malignant jaw tumours were recorded in tumour registry at AFIP. Basic epidemiological data regarding each case was collected from the request forms, which were retrieved from the registry data. The study included all malignant tumours involving maxilla and mandible diagnosed from Jan 2006 to Dec 2010. The specimens were received in 10% formalin. Gross examination of surgical specimens was performed and recorded on a proforma according to the guidelines of Royal College of pathologists UK. Adequate representative tissue sections from the lesions were taken. The material was processed under standardized conditions for paraffin embedding. The sections were stained with haematoxylin and eosin (H&E). Special stains and immunohistochemistry was applied when and where required. The data was analysed using SPSS version 16

Results

The study included 240 cases of malignant jaw tumours. There were 146 male and 94 female patients. Male to female ratio was 1.5:1. The age range was from 3 to 90 years. The most commonly affected age group was the seventh decade having 64 patients followed by 59 patients in the sixth decade and 40 patients in the fifth decade (Figure 1). Mandible was the most commonly involved site with 132 (55%) cases followed by maxilla having 108 (45%) cases. The tumours were divided into epithelial malignancies, salivary gland tumours, Hematolymphoid malignancies, soft tissue sarcomas, malignant melanomas and unclassified malignant tumours. The epithelial malignant tumours included 168 (70%) cases of squamous cell carcinoma. The histological grade was moderately differentiated in 68 cases, followed by 48 cases of well differentiated SCC and 42 cases of poorly differentiated SCC. Squamous cell carcinoma was seen in eighty nine males and sixty seven females.

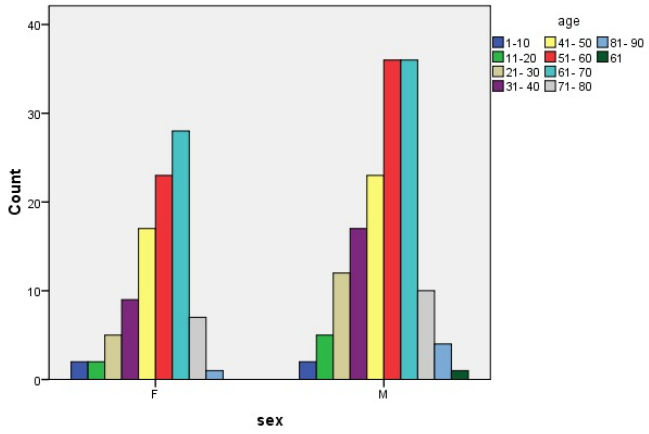

Figure 1:- Age group distribution of the cases.

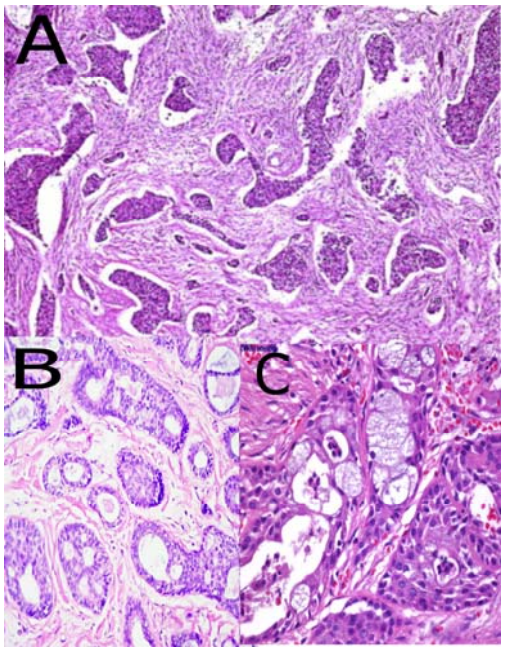

Figure 2:- Photomicrographs of Hematoxylin & Eosin stained sections of Squamous cell carcinoma (A), Adenoid cystic carcinoma (B) & Mucoepidermoid carcinoma.

There were 30 cases of malignant salivary gland tumours. There were 21 males and 9 female patients in the group. The commonest subtype was adenoid cystic carcinoma having 13 (5.4%) cases, followed by 12 (5%) cases of mucoepidermoid carcinoma, 3 (1.2%) cases of PLGA and 1 (0.4%) case each of Carcinoma ex pleomorphic adenoma and Adenocarcinoma (NOS). The hematolymphoid malignancies included 14 (6%) cases of Non-Hodgkin's lymphoma and among them all were diffuse large "B" cell lymphomas. Among the soft tissue sarcomas all the cases were of Rhabdomyosarcoma comprising 7 (10.4%). 3 cases were of malignant melanoma while two were simply labelled as malignant neoplasm. Distribution of the rest of the cases is given in Table 1.

TABLE 1:- Various subtypes of malignant tumours involving the jaw.

Tumours involving the Jaws	Number of cases (%) n= 240
• Squamous cell carcinoma	168 (70%)
• Salivary gland malignancies	30 (13%)
• NHL	14 (6%)
• Rhabdomyosarcoma	7 (10.4%)
• Malignant Melanoma	3 (1%)
• Malignant neoplasms	2 (0.8%)
• Plasma cell tumor	2 (0.8%)
• Metastatic prostatic adenocarcinoma	1 (0.4%)
• Metastatic transitional cell carcinoma	1 (0.4%)
• Olfactory neuroblastoma	1 (0.4%)
• Primitive neuroectodermal tumor (PNET)	1 (0.4%)

Discussion

The purpose of this study was to analyze the relative frequency of different malignant tumours which involve the jaw bones in patients of different age and gender. The results were than compared with the national and international data available. Five years data i-e from year 2006 to 2010 was gathered from records available at AFIP, Rawalpindi. We found that highest incidence of malignant jaw tumours was in 7th and 6th decade which is in accordance with most of the international studies. Male pre-dominance was observed with a male to female ratio of 1.5:1 which is quite similar to a study by Otoh et al [5] in which it was 1.3:1 and 1.4:1 in an another study carried out at Ghana by Parkins et al.[14]

In this study squamous cell carcinoma was the malignant tumour with highest frequency affecting maxilla and mandible and this finding is in accordance with the 69 % found in Ghana and 73 % found in Zimbabwe. Another study done by Weber et al [15] in USA also augments this finding. In these study salivary gland tumours were the second in the group (12.5%) with adenoid cystic carcinoma being the most frequent among them followed by mucoepidermoid carcinoma (MEC). In an Iranian study by Shishegar M et al,[16] Adenoid cystic carcinoma has the highest prevalence followed by MEC but in the west of Iran, China, India etc the frequency of MEC was higher than that of ACC, and MEC was the most common malignancy. Sarcomas contributed 10.5% of the total of which rhabdomyosarcoma was the most common. Here it is contradictory to two of the studies by Weber et al in USA and Taghavi et al[17] in Iran in which osteosarcoma tops the list. The incidence of metastatic tumour is also low when compared to other studies. Only two cases of metastatic tumour were retrieved in five years. Reports from different parts of the world show a variable incidence of metastasis to the jaw bone from different primary sites, ranging from one to four cases per year. In our study no primary odontogenic tumour of the jaw was seen.

In this study out of 240 cases there were 55% cases which involved mandible while remaining 45% involved maxilla showing mandibular pre-dominance. In a similar study by Parkins et al,[14] they found right anterior mandible to be involved more by tumours and tumour-like lesions. No similar local pakistani study has been done on this topic.

Conclusion

It is concluded that Squamous cell carcinoma is the most common malignant jaw tumour followed by malignant salivary gland tumours. The age range is wide and a male pre-dominance observed. Mandible is the most commonly affected site.

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