

Histopathological Study of Tumours and Tumour like Lesions of JawDr. Mohd. Anwar Miya¹, Dr. N. Vivekanand², Dr. Mohd. Imran Ali^{3*}¹Associate Professor Department of Pathology, Kakatiya Medical College, Telangana, India²Professor Department of Pathology, Osmania Medical College, Telangana, India³Assistant Professor Department of Pathology, Kakatiya Medical College, Warangal, Telangana, India**Original Research Article*****Corresponding author**

Dr. Mohd. Imran Ali

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Abstract: Tumours of jaw can be odontogenic tumours (arise from tooth forming tissues) or non- odontogenic tumours. In addition to these, fibro-osseous lesions like fibrous dysplasia, cementoblastoma and also giant cell lesions, like central giant cell granuloma, cherubism, brown tumour of hyperparathyroidism along with cystic lesions in the jaw can present as tumours in the jaws. To analyse the histopathological pattern of tumours and tumor like lesions of jaw. A two years prospective study of Tumours and Tumour like lesions of jaw was conducted at Department of Pathology, Osmania General Hospital, Hyderabad. Study was based upon the samples both biopsies as well as surgical specimens sent for diagnostic histopathological confirmation. A total number of 57 jaw lesions were received at the Department of Pathology, Osmania General Hospital during the two years period. Total number of biopsies in two years 8,729 Specimens of jaw lesions -57 (0.65%) Odontogenic Tumours -19 (33.3%) Non odontogenic Tumours -9 (15.7%) Tumour likes lesions -29 (50.8%). M: F Ratio: 1.1: 1 Common radiological appearance is well defined radiolucency. Ameloblastoma is the most common benign odontogenic tumour reported in the present study and among the non-odontogenic tumours, ossifying fibroma is the commonest benign neoplasm, **Keywords:** Jaw lesions, Odontogenic Tumours, Ameloblastoma, ossifying fibroma, radiolucency.

INTRODUCTION

Tumours in the jaw can arise from tooth forming tissues (odontogenic tumours) or from the jaw bone itself (Non-odontogenic tumours).

In addition to these, fibro-osseous lesions like fibrous dysplasia, cementoblastoma and also giant cell lesions, like central giant cell granuloma, cherubism, and brown tumour of hyperparathyroidism along with cystic lesions in the jaw can present as tumours in the jaws.

Odontogenic tumours are uncommon lesions and even in the specialized oral pathology laboratory, they constitute only about 1% to 2% of accessioned cases [1]. Many of these tumours present as radiolucent lesions, which in their early stages cannot be distinguished from cysts of the jaw or early stages of fibro-osseous lesions or hamangioma and other malignant lesions.

The vast majority of cases are benign, but there are a few malignant variants. Benign tumours of *non-dontogenic origin* like hemangioma, non-ossifying fibroma, osteoma, osteoblastoma, chondromyxoid fibroma can be seen in the jaw infrequently. The first golden age of Dentistry, 1835–1860 was a truly

remarkable and uniquely American Phenomenon, as declared in 1851. The very first odontogenic neoplasm reported in the literature was 7 cm cementoblastoma of a Maxillary Molar in 1839 by *Rodriguez BA*. It generally occurs in younger individuals and is most commonly associated with a mandibular first molar or second premolar [2].

The first odontogenic cyst reported in the literature was periapical cyst in 1839 by *Brown AM*. These cysts were referred to simply as 'sacs'. Ameloblastomas have been subdivided in to two biologic-microscopic subtypes – solid or multilocular type and cystic (unicystic).

Immunohistochemically, the tumour cells exhibit strong reactivity for keratin and are surrounded by a continuous layer of laminin in pattern similar to that seen in the developing tooth [3]. Ultrastructurally, the tumour cells show clearcut evidence of epithelial differentiation in the form of bundles of tonofilaments and complex desmosomes with some differences

existing between the follicular and plexiform types [4-6].

Squamous odontogenic tumour is first described as distinct entity by Pullon *et al.* It arises from the periodontal ligament or rests of malaseez[7]. It occurs during 10-67 years of age, without any gender predilection. Multiple lesions in the jaws of single patient are not unusual. Familial tendency has been noted in few cases [8]. Loosening of teeth is the most frequent presenting symptom. An extra osseous variant has been described [9].

Clear cell odontogenic tumour is classified in last WHO classification [10] as a benign tumour, but now it is recognized as a more sinister lesion and current opinion is that clear cell odontogenic tumour designated as carcinoma.

True hematogenous metastasis is still in doubt), but there are examples having metastasized to regional lymphnodes[11]. Tumour may infiltrate and destroy the bone, and nerve related spread is recorded [12]. It can be associated with cystic component.

Calcifying odontogenic cyst is first recognized as a distinct entity by Gorlin in 1962[13]. Praetorius *et al.* 1981 calcified it into a cyst and a neoplasm which is termed as dentogenic ghost cell tumour. It is classified as neoplastic lesion in WHO classification [10].

Tumours in which the myxomatous and the fibrous component are equally represented are designated as myxofibromas[14]. Osteosarcoma is most common primary malignant tumour of jaw. About 5%

of osteosarcomas occur in the jaws. The mandible (particularly body) is affected slightly more often than maxilla [15] chondrosarcoma is an uncommon neoplasm of jaws. The anterior maxilla is the most common location [16]. In 1946 Thoma and Goldman classified odontogenic tumours according to their tissue of origin as epithelial, mesodermal and mixed [17].

OBSERVATIONS

A total number of 57 jaw lesions were received at the Department of Pathology, Osmania General Hospital during the two years period .The present study is restrict our self to lesions arising within the jaw.

Tumour like lesions were included in present study because, though they are not neoplastic, they present clinically as mass lesions of the jaw and radiologically cannot differentiated from the tumours. This category includes fibro-osseous lesions of jaw, giant cell lesions of jaw and cystic lesions of jaw. Cystic lesions of the jaw are also included because of their tissue of origin (odontogenic cell rests) is similar to odontogenic tumours and infact, odontogenic tumours may arise from the odontogenic cysts.

Total number of biopsies in two years 8,729 Specimens of jaw lesions are 57 (0.65%) among these Odontogenic Tumours -19 (33.3%) Non odontogenic Tumours -9 (15.7%) Tumour likes lesions-29 (50.8%). Lesions are more from Mandible 41 (72%) followed by Maxilla 16 cases (28%). The Male to Female Ratio is 1.1: 1 (Table-1-2). Common radiological appearance is well defined radiolucency57.8%. Radio-opaque lesions constitute 3.5% only.

Table-1: Odontogenic Tumours

	No. of cases	Percentage
Benign Ameloblastoma	13	68.4%
Calcifying epithelial odontogenic tumours	4	21%
Adenomatoid odontogenic tumor	1	5.2%
Odontogenic myxoma	1	5.2%
<i>Malignant</i>	Nil	Nil

Ameloblastoma is commonest benign odontogenic tumour followed by Calcifying epithelial

odontogenic tumour. Malignant odontogenic tumours are not reported in this study (Figure-1).

Table-2: Non Odontogenic Tumours

	No. of cases	Percentage
Benign Ossifying Fibrome	6	66.6%
Malignant		
Chondrosarcoma	1	11.1%
Giant Cell tumor	2	22.2%

Tumour like lesions forms a majority group (50.8%) of all tumours and tumour like lesions of jaw. Of these radicular cyst is commonest lesion, followed by dentigerous cyst and fibrous dysplasia.

Ameloblastoma is the commonest odontogenic tumour in this study. Out of 13 ameloblastomas, 3 cases were previously reported as ameloblastomas and they have recurred. Of these two were follicular type and

one was cystic ameloblastoma. Hence the recurrence rate 23%.

Calcifying epithelial odontogenic tumour is second most common odontogenic tumour in this study. Calcified deposits and epithelial cells with prominent intercellular bridges found in all the cases.

Ossifying fibroma is the most common benign non-odontogenic tumour in this study. Total number of cases is 6. It is more common in females (66.6%) and common site is mandible (83.3%). Radiologically, mixed radiolucency and radio opacity seen predominantly (33.3%)

Radiacular Cyst is the most common tumour like lesion of the jaw in this study. Total number of cases - 10. of these one case (10%) is residual type of radicular cyst. Age ranging from 12-40 years. 7 cases

(70%) seen in males. Common in anterior maxilla (60%). Common radiological appearance is unilocular radiolucency seen, in 9 cases (90%). Dentigerous Cyst is the second most common tumour like lesion of the jaw in this study.

Impacted tooth is seen in 4 cases (44.4%) of these two cases involves mandibular canine. It is more common in males (88.8%). Common site is mandible body seen in 6 cases (66.6%) Common radiological presentation is unilocular radiolucency (55.5%).

Odontogenic keratocyst are only three. Mandible is involved in all the three cases (100%). One case (33.3) showing unilocular radiolucency with irregular borders, another case (33.3%) showing radiolucent area with radio opaque area. For one case X-ray was not available.

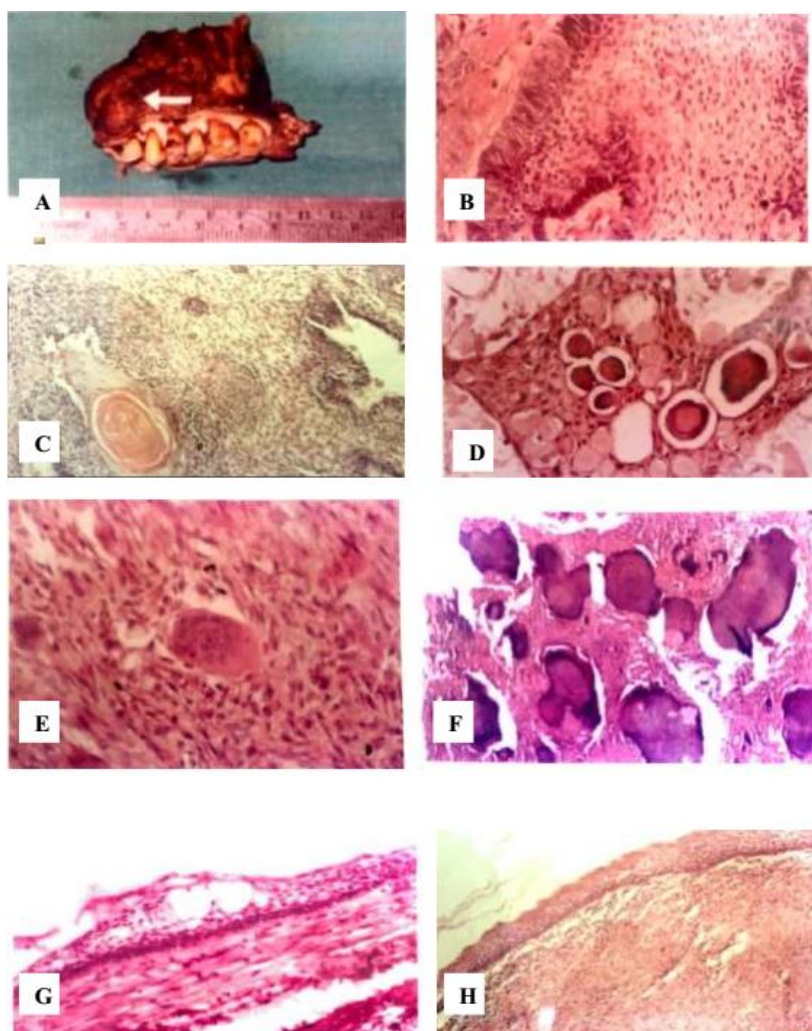


Fig-1:- A: Ameloblastoma-Grey white nodule in the maxilla. B: Ameloblastoma-Lining columnar cells with nuclei polarised away from the basement membrane H & E 40 X. C: Ameloblastoma-Acanthomatous type with keratin pearl H & E 20 X. D: Calcifying epithelial odontogenic tumour-concentric calcified deposits H & E 40 X. E: Giant cell tumour-large giant cell with numerous nuclei H & E 40 X. F: Ossifying fibroma-spherical masses of calcified tissue in fibrocellular stroma H & E 10 X. G: Dentigerous cyst-non keratinized stratified squamous lining on fibrous connective tissue H & E 10 X. H: Odontogenic keratocyst H & E 20 X.

DISCUSSION

Tumours of jaw can be odontogenic tumours (arise from tooth forming tissues) or non- odontogenic tumours. Odontogenic tumours form a complex group of lesions, of diverse histological patterns and clinical behaviour. Non-odontogenic tumours are also seen infrequently in the jaw when compared to long bones.

Tumour like lesions of jaw is common of all jaw tumours and most of these lesions present as radiolucent lesions and cannot differentiate from the tumours radiologically. Therefore integrations of radiographic, clinical and microscopic findings is necessary to reach a specific diagnosis. The present study of tumours and tumor like lesions of jaw was undertaken study the histopathological patterns of various tumours and tumor like lesions of jaw and to

observe the Age, sex and site incidence of tumors and tumor like lesions of jaw.

A total number of 57 cases were studied of which 33.3% (19 cases) are odontogenic tumours. 15.7% (9 cases) are non-odontogenic tumors and 50.8% (29 cases) are tumor like lesions.

Among the tumors of jaw odontogenic tumors are common. The incidence is 9.2% of all oral cavity lesions. When compared to Ana Ortega *et al.* 1.29% [18] and Sandhya Jain *et al.* 1.45% [19]. The incidence of odontogenic tumors in the present study is high. This disparity may be because, both Ana Ortega *et al.* and Sandhya jain *et al.* have taken incidence from specialized oral pathology laboratory, and they have studied large number of cases [Table-3].

Table-3: Odontogenic tumors-comparison with other studies

Odontogenic tumours	Mosqueda <i>et al.</i> [18] (Mexico) 1997	Lu <i>et al.</i> [18] (China) 1998	Sandhya Jain <i>et al.</i> [19] (1980) Nagpur	Present Study (2001-2002)
Benign Ameloblastoma	23.7%	58.5%	67.5%	68.4%
CEOT	0.8%	0.9%	Nil	21%
AOT	7.1%	8.3%	13.5%	5.2%
Odontogenic myxoma	17.7%	8.4%	8.1%	5.2%
Odontomas	34.6%	6.7%	Nil	Nil
Others	14.3%	11%		Nil
Malignant Odontogenic tumours	1.1%	6.1%		Nil
Others	14.3%	11%	10.9%	Nil
Malignant Odontogenic tumors	1.1%	6.1%	Nil	Nil

CEOT

Calcifying epithelial odontogenic tumor, AOT: Adenomatoid odontogenic tumour. Present study report ameloblastoma as commonest odontogenic tumor (68.4%). It correlates well with Lu *et al.* Sandhya jain *et al.* [19].

In the present study slight male predominance is noted (M: F = 1.14:1) mandible is the commonest site particularly molar ramus area (46%). Kim and Jan *et*

al. reports mandible- body as commonest site (60.6%) [20].

Present study shows multilocular radiolucency, is commonest (38%) radiological presentation whereas Kim and Jang *et al.* and Ueno *et al.* report unilocular radiolucency as commonest radiological presentation with 59.2% and 47% respectively [20-21].

Present study shows follicular type as commonest histological type which is similar to Ueno *et al* [Table-4].

Table-4: Ameloblastoma-comparison with other studies

Biological type	Kim and Jang <i>et al.</i> [20]	Ueno <i>et al.</i> [21]	Present Study (2001-2002)
Follicular type	29.5%	62%	30.7%
Plexiform type	35.2%	38%	23%
Follicular and plexiform type	9.8%	Nil	23%
Follicular and acanthomatous type	5.6%	Nil	7.6%
Desmoplastic typep	Nil	Nil	7.6%
Cyctic ameloblastoma	8.4%	Nil	7.6%
Others	11.2%	Nil	Nil

Recurrence rate-23% correlates with Kim and Jang *et al.* (21%) but it is more when compared to Ueno *et al.* 12.7% [20, 21].

Present study calcifying epithelial odontogenic tumours with mean age of 37 years and mandible as the commonest site (75%). It correlates with Philipson *et al.* [22] a study of 181 cases, 52% of cases are associated with unerupted tooth. But none of the 4 cases in a present study are associated with unerupted tooth. In the present study adenomatoid odontogenic tumor only one female patient with 40 years. Mendis *et al.* in their study of 26 cases, report 76% of cases occurred in the second decade with slight female predilection [23].

Odontogenic myxoma Incidence is 5.2%. Sandhya Jain *et al.* [19] reported incidence of 8.1%. It is common between 2nd and 3rd decades of life, and in the present study patient is 17 years old. Ossifying fibroma incidence in the present study is 10.5% similar to Sandhya Jain *et al.* is 8%. Present study reported female predilection (F:M = 2:1) and mandible as commonest site (83%). It correlates with Eversole *et al.* study of 64 cases which is also reported marked female predilection (F: M = 5: 1) and mandible as commonest site (89%) of involvement [24].

Chondrosarcoma is a rare tumor. Incidence in the present study is 1.76%. In Hackney *et al.* [16] study all three cases studied were females. Patient in the present study is also female. Maxilla is the commonest site in this tumor but involvement of mandible is seen in the present study. This tumor is usually confused with central giant cell granuloma.

Tumor like lesions constitutes majority group (50%) in the present study, which correlates well with National Institution of Nutrition data (75.3%). Radicular cyst is the commonest tumor like lesions 17.5% in the present study. Incidence of Odontogenic keratocyst is 5.2%. Not a single case of Aneurysmal bone cyst and simple cyst reported in the present study.

Central giant Cell granuloma Incidence – 5.2% Mean age in the present study is 20 years with female male ratio 2 : 1 Mandible is involved frequently (66%) in the present study. Waldron *et al.* reported mandible as commonest site [25]. Sandhya Jain *et al.* - Incidence of 0.15% of the total number of oral lesions in Nagpur, India. Her study also report female predominance (57%) and mandible as commonest site [19].

Radicular Cyst 50% of cases is seen in the 3rd decade with male predilection. Commonest site in the present study is anterior maxilla. Dentigerous Cyst Present study show marked predilection for males (88.8 %). Odontogenic Keratocyst- three cases in the present study occurred in the mandible. Parakeratotic stratified

squamous lining of the cyst is common (66.6%) in the present study. It correlates with Wright *et al.* [26].

SUMMARY

The prospective study of “Tumours and Tumour like lesions of Jaw” is undertaken at Osmania General Hospital for a period of 24 months.

Out of 8,729 cases reported during 24 months period, 57 were located in the Jaw. In the present study, of all the jaw tumors, incidence of odontogenic tumours is 33.3% nonodontogenic tumours is 15.7% and tumour like lesions is 50.8%. Males are more affected than females with M: F ratio 1.1:1. Asymptomatic Jaw swelling was the common presenting symptom. Well defined radiolucency was the commonest radiological finding.

Tumour like lesions forms the majority among jaw lesions which includes fibrous dysplasia, central giant cell granuloma, radicular cyst, dentigerous cyst and odontogenic keratocyst. Ameloblastoma is the most common benign odontogenic tumour reported in the present study followed by calcifying epithelial odontogenic tumour, adenomatoid odontogenic tumour and odontogenic myxoma.

Among the non-odontogenic tumours, ossifying fibroma is the commonest benign neoplasm. Malignant non odontogenic tumours encountered in the present study are giant cell tumour and chondrosarcoma. Metastatic jaw tumours are not seen in the present study.

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