CLINICOPATHOLOGICAL SPECTRUM OF AMELOBLASTOMA IN PATIENTS PRESENTING AT AYUB TEACHING HOSPITAL ABBOTTABAD

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Abstract

Objectives: *This study was carried out to find the clinicopathological spectrum of ameloblastoma cases.*

Materials & Methods: *This was a descriptive cross-sectional study that included 28 cases of ameloblastoma presenting to the Department of Dentistry, Ayub Medical College Abbottabad between January 2015 and December 2016*

Results: *Of the 28 enrolled patients 17 (60.7%) were male and 11 (39.3%) female. The mean age of the study population was 37.36 ±13.14 years. The lesion site for ameloblastoma in patients was mostly 23 (82.1%) mandible. The anterior mandible was involved in 5 (17.9%) while Posterior mandible was involved in 18 (64.3%) of the patients. The highest number of the Ameloblastomas 7 (25%) were Follicular followed by Acanthomatous Ameloblastoma in 5 (17.9%) cases and 4 (14.3%) cases each of Plexiform and Granular cell Ameloblastoma*

Conclusion: *The ameloblastoma was seen most commonly in the third decade of life. It is more common in males than females. The right posterior site was the most common site for the development of new ameloblastoma.*

Key Words: *Clinicopathological, Ameloblastoma, Spectrum*

Introduction

The odontogenic tumours are the most common neoplasm of the jaws[1]. These are derived from the epithelium and mesenchyme of the tooth remnant. Therefore, they are exclusively found in the Mandible and Maxilla, and occasionally in the gingiva[2]. Ameloblastoma is the most frequently encountered odontogenic neoplasm[3,] and it accounts for approximately 14% of all odontogenic tumours[4]. Its estimated incidence is approximately 0.5 per million population per year[5]. Most patients are diagnosed between 30-60 years of age and the mean age at discovery is about 40 years. Although considered to be a benign tumour, yet, it follows a locally invasive course and tends to recur after many years of apparent cure[6]. The neoplasm usually grows slowly; however, tumour growth can result in severe deformity of the craniofacial complex[7].

Based on the recent classification of the odontogenic tumours by World Health Organization, benign ameloblastomas are recognized in 4 subtypes, the solid/multicystic, the desmoplastic, the unicystic and the peripheral or extra osseous[8]. Malignant ameloblastoma is histologically typical ameloblastoma which though apparently benign, metastasize and give rise to distant lesions[1].

Ameloblastic Carcinoma is a tumour which initially resembles ameloblastoma histologically, but loses differentiation and develops into carcinoma[9]. Most ameloblastic carcinoma appears to arise

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denovo, but a few cases arising from preexisting ameloblastoma have been reported[10]. In contrast to ameloblastoma, the ameloblastic carcinoma presents a more aggressive clinical behaviour, such as rapid growth, perforation of the cortex and painful swelling[11].

The exact cause of ameloblastoma is unknown. However, there is evidence that various genes normally expressed during tooth formation are deregulated in ameloblastoma[2]. Deletion of an ameloblast adhesion molecule and enamel matrix protein called ameloblastin can cause an odontogenic tumour similar to ameloblastoma in animals. Many other genes have been proposed to play a role in pathogeneses including heat shock protein, inducible nitric oxide synthase and matrix metalloproteinase but none is the likely primary cause[12].

Radiologically, the ameloblastomas are osteolytic. The typical radiographic appearance is that of the multilocular radiolucent lesion. Buccal and lingual cortical expansion is usually present. Resorption of the roots of the teeth adjacent to a tumour is common. In many cases an unerupted tooth, most often the mandibular third molar is associated with the radiolucent defect[2].

The ameloblastoma has complex histopathology, and its several morphological variants have been reported, some of which have prognostic relevance[13]. A large tumour often shows a combination of the microscopic patterns[9]. In the recent years, studies have shown that not all the lesions with the histopathological features of ameloblastoma have the same potential for destruction, recurrence and metastasis. Thus, the present study was aimed to detect the clinicopathological spectrum of ameloblastoma in our community which will help us in a better understanding of this tumour and can help in planning for future management strategies.

Materials and Methods

This was a descriptive cross-sectional study that included 28 cases of ameloblastoma who presented to the Department of Dentistry, Ayub Medical College Abbottabad between January 2015 and December 2016.

A written informed consent was taken from all the patients. A detailed history and clinical examination were performed on every case. All the patients were advised x-rays Orthopantomogram (OPG). After clinical diagnoses, the surgical excision was performed. The tumours that involved one quadrant of the jaw were hemisected along a sagittal plane, parallel to the long axis of the jaw and those that extended across the midline were hemisected in coronal or axial planes. Each half was sectioned with a bone saw in 1-cm slices that were prepared parallel to the original section planes. The macroscopic appearances of all surfaces were described and recorded[13]. Histopathology was performed on the specimens, and the lesions were diagnosed as per WHO criteria[8].

Data were entered and analyzed using SPSS version 20. Quantitative variables like age were described as a mean & standard deviation. Categorical variables like gender, morphological variants were described as frequencies and percentage. The data was represented in the form of tables & graphs.

Results

This study enrolled 28 patients of Ameloblastoma who presented to the dentistry department of Ayub Medical College, Abbottabad. Of the 28 enrolled patients, 17 (60.7%) were male and 11 (39.3%) female. The mean age of the study population was 37.36 ±13.14 years. The age of patients ranged between 16-71 years. Most of the enrolled patients 9 (32%) were between 31-40 years followed by 7(25%) in 41-50 years and 6 (21%) in 20-30 years age group.

The lesion site for ameloblastoma in patients was mostly 23 (82.1%) mandible. The anterior mandible was involved in 5 (17.9%) while Posterior mandible was involved in 18 (64.3%) of the patients. Only 5 (17.9%) patients had Maxillary lesion, of which posterior maxilla was involved in 3 (10.7%) patients, while Anterior maxilla and bimaxillary involvement was reported in 1 (3.6%) patients each (Table-1).

Most of the enrolled patients 16 (57.1%) who either had mandible or maxillary ameloblastoma lesion, had a lesion on the right side while 11 (39.3%) had left side facial involvement. A single case (3.6%) was also reported with bilateral facial involvement. Majority of the patients 22 (78.5%) had facial asymmetry associated with the ameloblastoma lesion.

X-ray OPG was performed on all 28 patients. The OPG of 22 (78.6%) patients showed multilocular radiolucency while 4 (14.3%) patient had unilocular radiolucency and 2 (7.1%) cases had no radiolucency

on X-ray. OPG also revealed that 19 (67.9%) of the cases had root resorption of the adjacent teeth with a tumour. This root resorption was also clinically evident with the tooth mobility in the same number of cases.

Histopathology examination of the biopsies showed that the highest number of the Ameloblastomas 7 (25%) were Follicular followed by Acanthomatous Ameloblastoma in 5 (17.9%) cases and 4 (14.3%) cases each of Plexiform and Granular cell Ameloblastoma (Table-2). The cut section of these tumours showed that majority of the tumours 15 (53.6%) had greyish-white hue. Some tumours also showed greyish black, brown and hemorrhagic outlook. The patients who were diagnosed with Ameloblastoma had no associated neurological symptoms. Of the three diagnosed cases of Ameloblastic carcinoma, two patients reported with facial nerve and lingual nerve paralysis.

The study results indicated a significant association between the site of the lesion and radiolucency of the ameloblastoma. Of the total 28 ameloblastomas included in the study, 18 (81.8%) multilocular and 4 (100%) unilocular ameloblastomas were found in the posterior mandibular region (Table-3)

Table 1: Site of Lesion

Type	Frequency	Percent
Anterior Mandible	5	17.9
Posterior Mandible	18	64.3
Anterior Maxilla	1	3.6
Posterior Maxilla	3	10.7
Bimaxillary	1	3.6
Total	28	100.0

Table 2: Histological Types of Ameloblastoma

Type	Frequency	Percent
Acanthomatous Ameloblastoma	5	17.9
Ameloblastic carcinoma	3	10.7
Desmoplastic Ameloblastoma	1	3.6
Follicular Ameloblastoma	7	25.0
Granular cell Ameloblastoma	4	14.3
Mixed Type (Follicular and Acanthomatous)	2	7.1
Basal cell Ameloblastoma	2	7.1
Plexiform Ameloblastoma	4	14.3
Total	28	100.0

Discussion

Ameloblastoma is the most common odontogenic tumour of the jaws, and it has many subtypes like intraosseous/extraosseous, multilocular/unilocular, Malignant ameloblastoma and ameloblastic carcinoma, which have different clinical behaviour and prognoses and hence require different management protocol[14].

Our research study shares some features common with the other published studies. Both the age and sex distribution are within the estimated range of other reports [2], where the ameloblastoma was found more common in the males of the 3rd decade of life. However, in our research study, the mean age at diagnoses was 37.36 ±13.14 years which is little later than the previous study conducted by Chaisuparat[15] where the mean age at diagnoses was 33.8 years. The late diagnoses of the tumour in our country may be due to the lack of adequate diagnostic facilities, or due to ignorance of the patients about their oral and dental health.

The site and side involvement in our study also show similarity with a previous study performed in 2006 in the Nigerian teaching hospital, while analyzing 207 cases of ameloblastoma, where the right mandibular area was the most common site for the tumour occurannce[16].

As far as the histopathological spectrum of a tumour is concerned, we found that the follicular pattern[25.%] was the most common type, followed by the acanthomatous[17%], followed by the plexiform [14%]. Thus the plexiform pattern was even rare than acanthomous, which is in contrast to the available literature[9] where the plexiform was the most common histological subtype. However it was noted in our study that all the four cases of plexiform ameloblastoma were diagnosed in females so that the plexiform ameloblastoma may be the most common type in the female gender.

Some previous research studies also show that the histopathological subtypes may affect the prognoses of the tumor[17]. According to this research[18,] the follicular and acanthomatous types have the highest recurrence rate. Our research study also three cases of the recurrent ameloblastoma, one case was having a follicular pattern, while the two cases were having mixed histopathology of follicular and

Table 3: Radiolucency of Ameloblastoma

Site of lesion		Multiloculor	Uniloculor	No radiolucency	Total	P value
Anterior Mandible	Count	1	0	0	1	0.00
	%	4.5%	.0%	.0%	3.6%	
Posterior Mandible	Count	18	4	0	22	
	%	81.8%	100.0%	.0%	78.5%	
Anterior Maxilla	Count	1	0	0	1	
	%	4.5%	.0%	.0%	3.6%	
Posterior Maxilla	Count	2	0	1	3	
	%	9.1%	.0%	50.0%	10.7%	
Bimaxillary	Count	0	0	1	1	
	%	.0%	.0%	50.0%	3.6%	
Total	Count	22	4	2	28	
		100.0%	100.0%	100.0%	100.0%	

acanthomatous.

The unicystic ameloblastoma presents as a single cystic cavity[14]. The importance of differentiating this type is that enucleation carries a low risk of recurrence[1]. The unicystic ameloblastoma most commonly occurs in patients who are 16 to 20 years of age; occasionally lesions occur in even younger patients. However, the mean age of our patients suffering from unicystic ameloblastoma was 27±7.52 years. This may be again due to late diagnoses of a tumour in our country. The most common location of unicystic ameloblastoma is in the posterior mandibular region associated with an impacted third molar[2]. Same was the finding in our research, where all the cases were found in the posterior mandible where three cases were associated with an impacted mandibular third molar. The lesion is often asymptomatic, although large lesions may cause a painless swelling of the jaws[9]. In our study out of four cases only one case produced facial asymmetry, thus showing their more innocuous behaviour.

Ameloblastic carcinomas are the rarely occurring malignant odontogenic tumours, that show more aggressive clinical behaviour than ameloblastoma, like painful swelling, rapid growth, paresthesia and perforation of the cortex. Histologically these may show the features of epithelial dysplasia[11]. Our research study also included three cases of ameloblastic carcinoma. All the cases arise in the posterior mandible, and all were newly diagnosed cases without a history of pre-existing ameloblastoma. Two cases were strongly associated with lingual and facial nerve paralyses. On gross examination, their cut surface was much hemorrhagic than the ameloblastoma and histopathologically all the three cases presented with the features of epithelial dysplasia.

Conclusion

The ameloblastoma was seen most commonly in the third decade of life. It is more common in males than females. The right posterior site was the most common site for the development of new ameloblastoma. The follicular pattern was the most common pattern, followed by the acanthomatous. The plexiform pattern was seen only in the females. The ameloblastic carcinomas were more aggressive than the ameloblastoma.

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