

AMELOBLASTOMA: ANALYSIS OF 76 CASES FROM A UNIVERSITY-BASED BIOPSY SERVICE IN SAUDI ARABIA

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ABSTRACT

Ameloblastoma is the most clinically significant odontogenic tumor. There has been no previous comprehensive report from Saudi Arabia about the presentation and prevalence of the tumor. This study aimed to describe the cases of ameloblastoma seen in a biopsy service of a teaching hospital in Saudi Arabia over a 32 year period. The records and archival material of the patients seen during this period were examined and evaluated with emphasis on age and gender distribution and the location of the tumor. Classification of the variants was based on that outlined by the World health Organization (WHO). Seventy six cases were available for this study. Most cases of ameloblastoma were seen during the second and third decades and found to be more common in males in this study (M:F ratio of 2:1). The most common location of the tumor on the jaws was the mandible (92% of cases), particularly on posterior mandible. The most common variant was the solid/multicystic type (65%), followed by the unicystic variant (33%). Peripheral and desmoplastic ameloblastoma were very rare. Apart from high number of unicystic ameloblastoma, the general presentation of ameloblastoma in this Saudi Arabian institution is similar to those reported in various parts of the world in terms of demographic and clinical features.

Key Words: Ameloblastoma, analysis, university based Biopsy Service.

INTRODUCTION

Ameloblastoma was defined by the World Health Organization (WHO) in 2005 as “a benign, locally invasive odontogenic neoplasm of putative enamel organ origin”.¹ When consideration is made for odontogenic tumors with clinical significance, ameloblastoma ranks first. The more common odontomas are of minor clinical significance and generally regarded as hamartoma and not true neoplasm. In some parts of the world, ameloblastoma is even more common than odontomas.²⁻⁴ The prevalence of ameloblastoma ranges between 11% and 18% of all odontogenic tumors from most studies.^{5,6} They typically present clinicopathologically as one of 3 forms: solid/multicystic (SMA), unicystic (UA) and peripheral (PA). Rarely, malignant forms are encountered. The clinical significance of SMA is highlighted by its relatively high infiltrative capacity and recurrence (especially after less than optimal treatment). The typical presentation of UA is like benign odontogenic cyst while PA presents as an extraosseous growth. Both latter lesions do not share the infiltrative behavior of SMA and have relatively much lower recurrence rates.

Reports devoted to assessing the prevalence of odontogenic tumors in Saudi population are very rare.⁷ Even more importantly, no previous report on specific clinically important odontogenic tumors such as ameloblastoma in Saudi population was found in the literature. Ameloblastoma has been reported to have racial and geographic differences among populations.^{5,6} This study aimed to analyze retrospectively the cases of ameloblastoma diagnosed in the oral biopsy service of the College of Dentistry, King Saud University, Riyadh, Saudi Arabia over a 32 year period (1984-2015). This institution is the premier university in Saudi Arabia and oral biopsy services commenced in 1984 and have been continuous since then. Additionally, it is aimed that the findings from this Saudi population can be related to those from other parts of the world.

METHODOLOGY

The study was approved by the College of Dentistry, Research Center (CDRC registration number FR 0280). The study comprised biopsy records of patients whose biopsy specimen were seen and diagnosed as ameloblastoma at the Histopathology laboratory from January 1984 to December 2015. The data extracted from the records include the age, sex, location and clinicopathologic type of lesion. The archived slide(s) of each case was then recalled to re-evaluate the diagnosis. All the slides were evaluated by the author. New hematoxylin and eosin (H & E) slides were made from their original histological blocks in cases where they

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were no longer available. Only primary tumors were included in the study. The location of ameloblastoma in the jaws was categorized thus: maxilla into anterior (incisor-canine), premolar area and posterior (from first molar); mandible into anterior (incisor-canine), premolar area and posterior mandible. Those cases in which the exact location could not be verified were labeled as “unspecified” for both jaws.

TABLE 1: GENERAL AND CLINICO-PATHOLOGICAL FEATURES OF PATIENTS WITH AMELOBLASTOMA

Age (years)	
Mean	28.8
Range	11- 65
Gender Distribution (%)	
Male	51 (67)
Female	25 (33)
Location (%)	
Maxilla	06 (08)
Mandible	70 (92)
Ameloblastoma Subtype (%)	
Solid/multicystic	49 (65)
Unicystic	25 (33)
Desmoplastic	01 (1)
Peripheral	01 (1)

The data was tabulated and descriptive statistics was performed to assess the frequency and percentages of each variable. To reasonably identify the frequencies of clinicopathologic types of ameloblastoma among age groups, a commonly used stratification of age into decades was done. Mean age and age range were also calculated for each type.

RESULTS

Seventy six cases of ameloblastoma made up of 51 male patients (67%) and 25 female patients (33%) were included in the study. The mean age of patients was 28.8 years with a range of 11-65 years. Ameloblastoma was almost 12 times more common in the mandible (92%) than in the maxilla (8%). The predominant subtypes of the lesion were SMA (Fig 1) and UA (Fig 2) together accounting for 98% of all cases (Table 1).

Solid/multicystic ameloblastoma (SMA)

The mean age of presentation of SMA was found to be higher in males (31.7 years) than in females (25.9 years). The peak age of incidence for this group was in the second and third decades (Fig 3). The commonest location of SMA was found to be the posterior mandible comprising the molar area, the angle, ramus and coronoid processes (Table 2). This was followed by the premolar area of the mandible. This location presentation was similar in both sexes. The cases seen in the maxilla were too few and did not seem to have a specific sight predilection.

TABLE 2: PATIENTS (N=49) WITH SOLID/MULTICYSTIC AMELOBLASTOMA

		Male	Female
Age Mean(Range) in years	29.9 (13-58)	31.7 (14-58)	25.9 (13-47)
Location (%) Anterior maxilla	1 (2.0)	0 (0)	1 (7.1)
Posterior maxilla	2 (4.1)	2 (5.7)	0 (0)
Maxilla unspecified	2 (4.1)	1 (2.9)	1 (7.1)
Anterior mandible	9 (18.4)	7 (20)	2 (14.3)
Premolar area	5 (10.2)	4 (11.4)	1 (7.1)
Posterior mandible	19 (38.8)	13 (37.1)	6 (42.9)
Mandible unspecified	11 (22.4)	8 (22.9)	3 (21.4)
Total (%)	49 (100)	35 (100)	14 (100)

TABLE 3: PATIENTS (N=25) WITH UNICYSTIC AMELOBLASTOMA

		Male	Female
Age Distribution: Mean (Range) in years	25.1 (11-50)	5.9 (11-50)	24.1 (12-46)
Location (%) Anterior mandible	2 (8)	2 (13.3)	0 (0)
Premolar area	2 (8)	1 (6.7)	1 (10)
Posterior mandible	18 (72)	11(73.3)	7 (70)
Mandible unspecified	3 (12)	1(6.7)	2 (20)
Total (%)	25 (100)	15 (100)	10 (100)

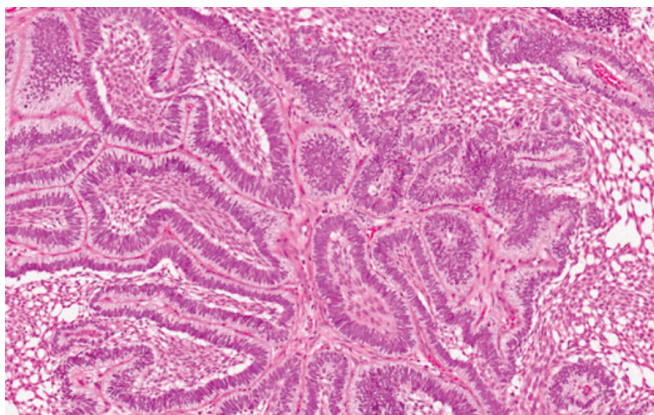


Fig 1: Solid/multicystic ameloblastoma (SMA), (H&E,100X)

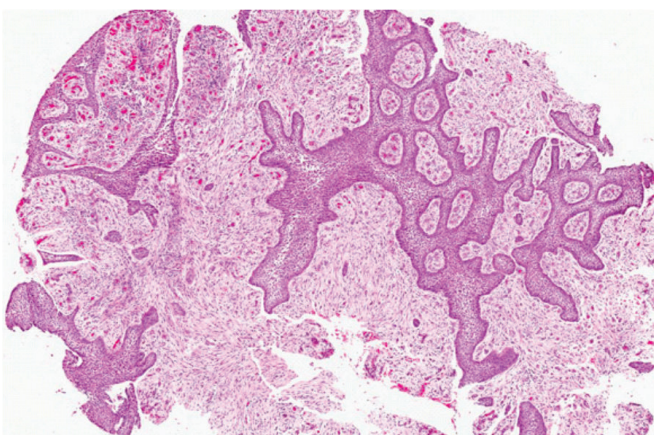


Fig 2: Unicystic ameloblastoma (UA), (H&E,12.5X)

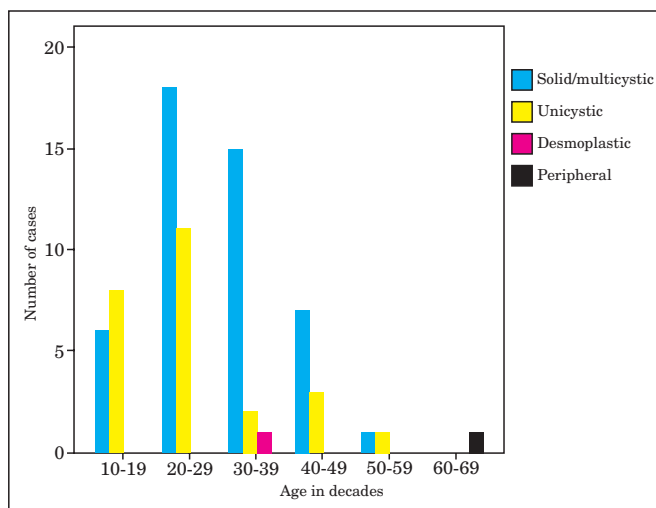


Fig 3: Age distribution (in decades) of ameloblastoma in a Saudi Arabian patient population

Unicystic ameloblastoma (UA)

In both sexes, the mean ages of both sexes were generally lower in patients with UA than those with SMA (Tables 2 and 3). In similarity to SMA, the mean age of presentation of UA for males was also higher

than for females, although the difference here was not as marked as in SMA. The peak age of incidence for UA was in the first and second decades (Fig 3). No case of UA was found in the maxilla and most cases were located in the posterior mandibular area (Table 3).

Desmoplastic ameloblastoma

One case of this lesion was found in a 32 year old female in the anterior maxilla.

Peripheral ameloblastoma

A case of PA was seen in the soft tissue distal to the right mandibular last molar in a 65 year old man.

DISCUSSION

This study examined the cases of ameloblastoma that were diagnosed at a biopsy service and have complete demographic data in a Saudi Arabian dental teaching hospital from 1984 to 2015. Racial and geographic difference in the incidence rates and presentation of ameloblastoma has been previously reported.⁸⁻¹⁰ It was therefore worthwhile to examine and report cases from Saudi Arabia. A very recent report from the same institution using the same material as used in this study showed that ameloblastoma accounted for 25% of odontogenic tumors.⁷ This is more than 11% to 18% suggested by Siar et al⁵ but still quite less than the percentage reported for populations in China¹¹ and Egypt.¹²

In assessing the age distribution of all ameloblastoma in this study, most cases presented during the second and third decades in similarity to many previous studies.^{6,13} The mean age of patients in this study (28.8 years) was much lower than most others (averaging 35.9 years).⁶ This may be in agreement with previous suggestion that the mean ages of patients in developing countries tend to be lower than in developed countries.⁶ Also, the gender distribution of 2.04:1 (male: female ratio) is higher than the almost equal gender¹³ or just slightly higher male predilection in most studies.⁶ In agreement with virtually all previous studies, the mandible was by far the most common location for ameloblastoma, particularly the posterior mandible.¹³

The mean age of SMA and UA was higher in males than females, although much more pronounced in SMA. This is in agreement with many previous studies as reviewed by Reichart et al.⁶ According to these authors, this phenomenon cannot be explained by suggesting that women seek treatment earlier than men as studies have shown that they actually delay seeking medical treatment in comparison to men by as much as 9 months.⁶ This implies that it may just be the biological tendency of ameloblastoma to afflict men at a later age than women.

About 6% of cases of all ameloblastoma are said to be of the unicystic variant.⁶ In this study, UA constituted approximately 33% of the cases. The cause for this unusually high number of UA is not immediately apparent. It may just be based on referral of lesions suspected to be dentigerous cysts to this institution for treatment which were later found to be UA on histology. Unlike SMA, UA tends to be more common in the first and second decades with its peak in the second decade. This is also in agreement with previous reports.¹⁴ Presentation during adolescent years has been particularly related to the presence of an impacted tooth especially the third mandibular molar.¹⁴ Also of note is that UA in this age group has a male predilection of 1.5:1 (M:F ratio)¹⁴ which is the same as found in this study. In UA seen in older age groups, there is a slight female predilection.¹⁴ When all UAs are considered together, there seemed to be no gender predilection.¹⁵ Most of the cases of UA seen in this study occurred in the first and second decade (Fig 3). UA is said to have a particular predilection for the mandible with more than 90% of cases occurring there.¹⁵ In this study, all the cases of UA were found in the mandible.

In this study, 1% of cases were each desmoplastic ameloblastoma (DA) and PA respectively. In recent years, DA has been considered a separate variant of ameloblastoma because of its relatively unique radiographic and locational characteristics. It is rare in most racial populations except the ethnic Chinese.¹⁶ It shares several features of SMA except that 50% of cases seemed to have mixed radiolucency/radiolucency radiographic presentation and with far more cases in the maxilla and anteriorly located than SMA. The single case reported in this study fits the general profile of DA as described by the WHO.¹ PA is believed to constitute about 1.3-10% of all ameloblastoma.¹⁷ In this study, it seemed to be very rare and was found in a male patient who presented with a recurrence 4 months after initial excision.

In conclusion, ameloblastoma as seen in this institution-based study is generally similar to those described in previous studies. As this is the first relatively comprehensive report on this important odontogenic tumor from an institution in Saudi Arabia, it may serve as a useful baseline reference to clinicians and pathologists within the country and beyond.

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