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Histopathologic features and management of ameloblastoma: study of 20 cases

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ABSTRACT

Background: Odontogenic ameloblastoma (OA) of the jaws is a rare neoplasia of the oral cavity (0.78%) with a 5:1 mandible/maxilla relation, with the molar region and the ascendant ramus being the most affected areas. Comparing our results with the literature demonstrated to us that this tumor may be considered to be a worldwide problem due to the similarity in clinical findings among different ethnic groups

Case series: The purpose of this study of 20 patients with ameloblastoma of the mandible and maxilla diagnosed at the Stomatology and Head and Neck Services of Heliópolis Hospital, São Paulo, Brazil, from 1980 to 1997, was to establish the histopathologic pattern of classification of those tumors through optical microscopy and the relation of this histopathology to therapeutic management. Using the Regeze, Kerr and Courtney classification (1978), we diagnosed follicular tumor in 11 cases, plexiform in 6 cases and unicystic in 3 cases, and performed surgical resection with a safety margin of 1.5 to 3.0 cm in the follicular and plexiform cases and bone curettage in the unicystic cases.

Keywords: Ameloblastoma. Histopathology. Surgery.

INTRODUCTION

Odontogenic ameloblastoma (OA) of the jaws is a rare neoplasia of the oral cavity (0.78%) with a 5:1 mandible/maxilla relation, with the molar region and the ascendant ramus being the most affected areas. Comparing our results with the literature demonstrated to us that this tumor may be considered to be a worldwide problem due to the similarity in clinical findings among different ethnic groups. The widening of our knowledge will allow us to find solutions and fight against the overall harmful effects of such tumors.

The choice of best management method needs to be made between a histological classification into types 1, 2 and 3 (Vickers and Gorlin),¹ or by establishing the relation between clinical behavior and histopathological pattern according to age and anatomical location (Regeze, Kerr and Courtney).² After a histopathologic review, we thus established a correlation between these features and the best therapeutic procedure, with the aim of decreasing disease recurrence.

CASE SERIES

Between 1980 and 1997, 45 odontogenic tumors were reviewed, representing 0.78% of

all oral cavity benign tumors (Table 1).

A selection of 29 ameloblastoma cases was made from among 45 patients with odontogenic tumors (Table 1) who had been submitted to different surgical procedures at the Stomatology and Head and Neck Service of Heliópolis Hospital between 1980 and 1997. From this selection, 20 cases were reviewed by means of histopathologic specimens, using optical microscopy with hematoxylin-eosin, relating them to age, sex, ethnic group and surgery. For statistical analysis, the hypothesis test was used for relating the results from our group to those in the literature.

Among these cases, the location affected was the mandible in 27 cases and the maxilla in 2 cases, whose ages ranged from 20 to 30 years old, comprising 16 blacks and 13 whites, 14 females and 15 males. Reanalysis was possible in 20 cases, which were classified according to the Regeze, Kerr and Courtney² criteria (Table 2).

Table 2 shows that there was a predominance of white patients over black ones: two-thirds of all cases, summing the three types of tumor. The male to female ratio was 7:4 for the follicular type. The mandible location occurred in 19 cases whereas there was only 1 in the maxilla location. The histopathologic reclassification showed that follicular

ameloblastoma (11 cases) affected the body of the mandible in 6 cases, the ascendant ramus in 3 cases and the angle in 2 cases. For the plexiform type, there were 5 cases in the body of the mandible and 1 in the angle, and for the unicystic type, 2 in the body and 1 in angle (Figures 1, 2 and 3).

The distribution of ameloblastoma histological type according to age is shown in Table 3.

DISCUSSION

Günhan et al³ noticed a rate of 1.3% for odontogenic tumors of the oral cavity, of which 46.34% were ameloblastomas. In our results, the ratio of these tumors was 0.78% to 64.44% (Table 1). No predominance of one sex over the other was shown in our data (Table 2), nor has it been observed by others. The predominant age group in our material was 20 to 30 years old (Table 3), whereas other series showed a wider range of 11 to 31 years old. The frequency of the follicular type was similar for all ages from 11 to 60 years old, with an average of 45.1 years old. For the other two categories (plexiform and unicystic), greatest incidence occurred within the age range 11 to 30 years old, with the average ages being 34.3 and 22.7 years old, respectively.

The follicular type of ameloblastoma was the most common (Table 3), agreeing with the findings of Regeze et al.² According to Chapple and Manogue,⁴ this tumor consists of discrete follicles with a similarity to the starry reticulum of the external enamel with a varying quantity of conjunctive tissue stroma. The covering epithelium is columnar or cuboid with nuclei positioned

Table 1- Relation between odontogenic tumors and ameloblastoma

Odontogenic Tumor	Number	%
Ameloblastoma	29	64.44
Others	16	35.56
Total	45	100.00

Table 2- Distribution of Ameloblastoma histopathological types according to skin color, sex and location

Histopathology	Number	Skin color		Sex		Location	
		Black	White	Female	Male	Mandible	Maxilla
Follicular	11	4	7	4	7	10	1
Plexiform	6	1	5	4	2	6	0
Unicystic	3	1	2	1	2	3	0
Total	20	6	14	9	11	19	1

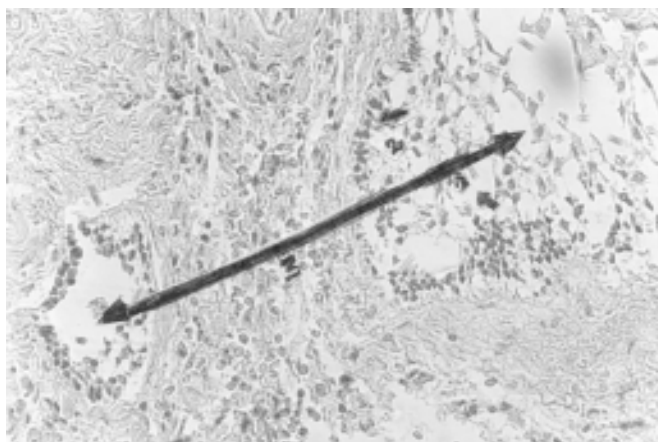


Figure 1 - Photomicrograph of follicular ameloblastoma (hematoxylin eosin x250). 1: islets or trabeculae formed by cells loosely arranged like the starry reticulum of the external enamel. 2: layer of high columnar cells reminiscent of ameloblasts, with nuclei positioned opposite the basal membrane. 3: follicles.

opposite the basal membrane. In Figure 2, the plexiform type is shown to have degeneration of the stroma with the formation of cysts with few areas similar to the starry reticulum, thus justifying its low aggressiveness.

According to Vasan,⁵ the follicular type consists of discrete epithelial lines in a conjunctive tissue stroma and the plexiform consists of a continuous line of anastomosis. According to Ackerman, Altini and Shear,⁶ the unicystic type is found as three forms: unilocular capsules, diffused intraluminal and diffused intramural, spreading out to the middle of the conjunctive tissue. This has been corroborated in the new classification from Philipsen and Reichart.⁷ In our material, the greatest incidence was of the follicular type (11 cases), compared to plexiform⁶ and unicystic,³ with 19 cases occurring in the mandible location and 1 in the maxilla.

The anatomopathological classification of the ameloblastoma is not yet routine, but we are convinced that dealing with the differences in histologic patterns is relevant in establishing surgical procedures, from the simplest biopsies and bone scraping to the most invasive acts. According to Williams,⁸ the therapeutic model and treatment of these tumors depends on their size. The choice of extra- or intra-oral approach is determined during surgical planning, with

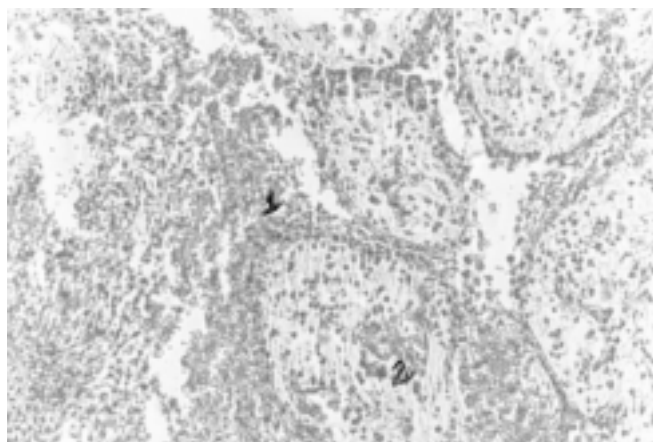


Figure 2 - Photomicrograph of plexiform ameloblastoma (hematoxylin eosine x250). 1: interconnected epithelial bridges. 2: degeneration of the stroma with cyst formation. There are minimal areas of starry reticulum and in some regions ameloblasts are not evident. No inflammation in the stroma.

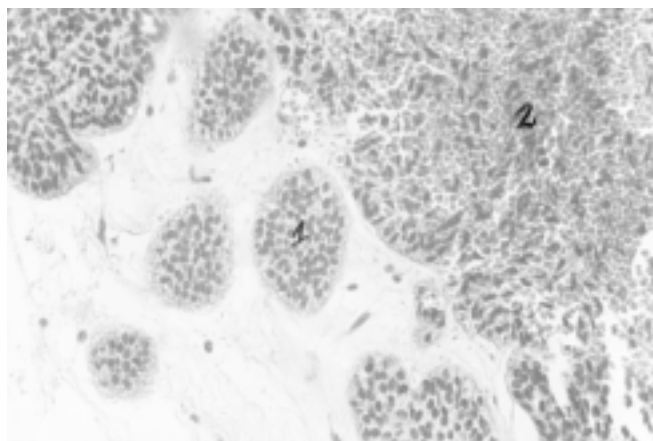


Figure 3 - Photomicrograph of unicystic ameloblastoma (hematoxylin eosin x250). 1: cysts in the process of formation. 2: conjunctive tissue dispersed over the stroma.

Table 3 - Ameloblastoma histological type related to age ranges

Age	Histological type			Total
	Follicular	Plexiform	Unicystic	
11 ─ 20	2	1	1	4
21 ─ 30	2	2	2	6
31 ─ 40	2	1	0	3
41 ─ 50	2	1	0	3
51 ─ 60	2	1	0	1
61 ─ 70	1	0	0	1
Total	11	6	3	20

the aim of completely extirpating the tumor, with or without reconstruction of the bone affected. Therapy is not the main focus of this paper, but when resection is essential, bone reconstruction using plates and titanium screws or an integrated bone implant may become necessary.

It can be seen that the invasive borders of ameloblastomas are diffuse and the clinical concept of a safety margin is needed. In order to prevent recurrence, we would suggest a safety margin of 1.5 to 3.0 centimeters. Nevertheless, Feinberg and Steinberg⁹ indicate different surgical margins for resections depending on the anatomical location and esthetic involvement. According to Li, Fabian and Goodman,¹⁰ surgery is the only treatment for ameloblastoma, due to its resistance to irradiation therapy. Anastassov et al¹¹ have reported that radiotherapy alone or associated with chemotherapy is only indicated for patients of advanced age.

Finally, we believe that histological classification of ameloblastoma will become routine in their morphological characterization. Regular use of immunohistochemical procedures will in the future bring more reliable results for determining best surgical procedures for preventing recurrence of such tumors. For the plexiform and follicular types, radical resection is the best procedure, with a safety margin of 1.5 to 3.0 centimeters, and for the unicystic type, bone curettage is indicated.

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RESUMO

Contexto: O ameloblastoma odontogênico é uma neoplasia rara da cavidade oral (0,78%), com relação de 5:1 entre a localização na mandíbula e na maxila, sendo as regiões molar e do ramo ascendente as áreas mais afetadas. A comparação entre nossos resultados e a literatura permite-nos considerar esta neoplasia um problema mundial em função dos achados clínicos semelhantes em diferentes grupos étnicos. **Relato de Caso:** A proposta deste estudo com 20 pacientes com ameloblastoma da mandíbula e da maxila, diagnosticados nos Serviços de Estomatologias e Cabeça e Pescoço do Hospital Heliópolis, São Paulo, Brasil, de 1980 a 1997, é estabelecer o modelo histopatológico de classificação destas neoplasias através da microscopia óptica e sua relação com a conduta terapêutica. De acordo com a classificação de Regeze, Kerr e Courtney (1978), foram diagnosticados o tipo foliolar (11 casos) o plexiforme (6 casos) e o unicístico (3 casos). A indicação terapêutica foi ressecção com margem de segurança de 1,5 a 3,0 cm para os dois primeiros e curetagem para o tipo unicístico.