

## Original Research Article

# Epidemiological profile of ameloblastoma at Erasto Gaertner Hospital

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## Abstract

**Introduction:** Ameloblastoma is the most common benign tumor of odontogenic origin, and represents about 11% of all odontogenic tumors. It is characterized by being locally aggressive and having high recurrence rates. **Objective:** To evaluate the occurrence of ameloblastoma in the Erasto Gaertner Hospital in patients from 1972 to 2012. In addition, to assess the main treatments, the most prevalent histological variants, the recurrence rate, the anatomical location of the lesion and patient profile. **Material and methods:** A retrospective study of patients diagnosed with ameloblastoma at the Erasto Gaertner Hospital between the years 1972-2012 was performed. Epidemiological data were collected such as gender, age, race, lesion location, type of surgical procedure, follow-up and recurrence rate; and analyzed using descriptive statistics. **Results:** A total of 40 patients were selected for the study. The most affected age group was between the third and fifth decade of life, with 19 cases (47.5%), followed by the second and fourth decade, with 14 cases (35%); the sixth decade, with 5 cases (12.5%) and seventh decade with 1 case (2.5%). The patients' ages ranged from 13 to 66 years, with an average age 34.9 years. The mandible was the most affected site, with 38 cases (95%) of cases, and maxilla had only 2 cases (5%). Thirty-eight patients were treated with radical surgery and 5 patients presented recurrence after 1 year of follow-up. Both cases that occurred in maxilla presented recurrence. **Conclusion:** Recurrence of ameloblastoma decreases significantly when surgery is performed properly, with wide excision and margin. Combination of full tumor resection and reconstruction was the best approach observed in this study. In addition, we recommend a long period of clinical and radiographic follow-up.

## Introduction

The ameloblastoma is the most common benign tumor of epithelial odontogenic origin, and represents about 11% of all odontogenic tumors [3]. It originates from epithelial remnants of intra and/or extra-osseous location [6]. Characterized by slow and painless swelling is often diagnosed due to increased local volume or by means of routine radiographs [11].

Radiographically it can appear as unilocular or multilocular radiolucent images, with bone erosion. It may be associated with impacted teeth and cause radicular resorption [19]. The most frequent location is posterior mandible, but it is rarely found in the maxilla, where the prognosis is much worse due to increased infiltration of trabecular bone and anatomic location [4]. The peak incidence occurs at the third and fourth decades of life with equal gender distribution [14].

The high recurrence rates remain problematic, and several factors have been identified, such as clinicopathologic variant and anatomical location [12]. The occurrence in maxilla, due bone porosity, facilitates the spread of the tumor [4], that behaves more aggressively than in the mandible [2].

Treatment for ameloblastoma may be conservative or radical. The conservative technique includes enucleation and/or curettage. The radical treatment includes partial or marginal resection associated with chemical (Carnoy's solution) or thermal (cryotherapy) adjuvant treatment.

While conservative therapies may be presented as less morbid for patients, there are increased risk of recurrence in such treatment. For that reason, radical treatments have lower rates of recurrence and constitute the vast majority of cases [15], but this choice often requires bone reconstruction to restore function and aesthetics [24].

The aim of this study was to establish an epidemiological profile of ameloblastoma in the hospital, between the years of 1972 and 2012, assess the main treatments, the relapse rate, anatomic location of the lesion, and the patient's profile.

## Material and methods

A retrospective study was conducted with patients with diagnosis of ameloblastoma referred to the

Service of Oral and Maxillofacial Surgery of the Erasto Gaertner Hospital between the years of 1972-2012. Epidemiological data were collected such as gender, age, race, lesion location, type of surgical procedure, follow-up and recurrence rate. The study excluded patients with follow-up less than 12 months.

## Results

Between the years of 1972 and 2012, 54 patients were diagnosed with ameloblastoma. Fourteen patients were excluded because they had a follow-up lower than 12 months. From the 40 cases included in the study, 52.5% were women and 47.5% were men between the second and seventh decade of life. The patients' ages ranged from 13 to 66 years, with an average age of 34.9 years (table I). Most patients were white (77.5%) and the most frequent site was the posterior region of the mandible (90%). Maxilla presented only 2 cases (5%), both in posterior region.

**Table I** - Demographic characteristics

<b>Gender</b>	Female	21(52.5%)
	Male	19 (47.5%)
<b>Color</b>	White	31 (77.5%)
	Black	7 (18.4%)
<b>Age</b>	0-9	0
	10-19	6 (15%)
	20-29	9 (22.5%)
	30-39	9 (22.5%)
	40-49	10 (25%)
	50-59	5 (12.5%)
	60-69	1 (2.5%)

Forty-four patients had larger lesions with large involvement of the mandible region: body and angle (15.8%), body and ramus (18.4%), symphysis and body (5.3%), symphysis and ramus (2.6%); and one case with involvement of the right and left side of the mandible (2.6%) (table II).

All patients underwent surgical treatment, 38 (95%) were subjected to a surgical treatment in the mandible, with resection of the lesion with peripheral osteotomy and 2 cases (5%) underwent surgery in the maxilla. The mandibular reconstruction, when indicated, was performed with microvascular fibular graft or iliac crest bone graft.

**Table II** - Clinical characteristics of studied cases

Anatomical site	Region (%)	Treatment	Recurrence
<b>Mandible</b> (n = 38)	Body (42.1)	Radical surgery	5 (13,5%)
	Angle (2.6)		
	Ramus (5.3)		
	Body and angle (15.8)		
	Body and ramus (18.4)		
	Symphysis and body (5.3)		
	Symphysis and ramus (2.6)		
	Right and left side of the mandible (2.6)		
<b>Maxilla</b> (n = 2)	Posterior region (100)	Radical Surgery	2(100%)

Five patients presented recurrence in the mandible, and both cases that occurred in the maxilla also relapsed. The time for recurrence ranged from 10 months to 9 years, with a mean of 5.11 years. One patient, who had ameloblastoma in the maxilla, died from aggressiveness of the tumor and complications of the treatment.

## Discussion

The ameloblastoma is a benign tumor, locally aggressive, with odontogenic origin [25]. Most patients have between 30 and 60 years at time of diagnosis. Clinically, it is characterized by slow growth, painless enlargement and expansion involving the maxillary bones, leading to a facial deformity [18]. There is no predilection for sex [9]. In the present study gender distribution showed no preferences, as most reports in literature [1, 6-8, 21].

The location of the tumor is related to the individual's ethnicity, with the posterior region most frequently involved in Caucasian and Japanese; while in black, especially those of African origin, the anterior region is most common site of the disease [16]. This study had a high prevalence of white individuals.

Our study has identified that the mandible was the most affected site, posterior region with 36 cases (90%), the anterior with 2 cases (5%), which is in agreement with almost studies [4, 6, 8, 17].

The ameloblastoma is an odontogenic tumor with a strong tendency to recurrence after treatment [20]. There are many treatment protocols, the most appropriate being surgery. Cryotherapy, radiotherapy and chemotherapy are also reported, although the effectiveness of these procedures have not been established by controlled studies. Ameloblastomas

inadequately treated enables greater chance of relapse [26].

It is believed that the recurrence rate is related to many factors such as tumor subtype, methods of treatment and tumor behavior [5]. Nakamura *et al.* compared the long-term results of 78 cases of ameloblastoma, obtained a recurrence rate of 7.1% after radical surgery and 33.3% after conservative treatment. They recommended wide jaw resection as the best treatment for ameloblastoma [13]. Our study had a 17.5% recurrence rate after radical surgical treatment.

Sassi *et al.* [24] evaluated 43 patients, 31 who had no previous treatment were submitted to surgical treatment with a recurrence rate of 4 (13%) of cases. Of those who relapsed, 2 performed only partial resection, 1 curettage and cryotherapy; and 1 wide resection. Lower recurrence rate is observed with radical surgical treatment.

According to Doenja Hertog *et al.* [10] all patients in whom preoperative diagnosis of ameloblastoma was available were advised to radical surgery. However, in the 28 patients who were treated by enucleation, the recurrence rate reached about 60% over a mean follow-up of 8.3 years.

The reconstruction of large defects, caused by radical surgery with microvascular fibular graft favors patient in functional, aesthetic aspects for fast reintegration into society and minimize psychological effects arising from surgery [22].

Sassi *et al.* [23] confirmed the successful outcome of the functional rehabilitation of the stomatognathic system with titanium cylinder implants in microvascular fibular graft for reconstruction of mandible.

Ameloblastomas have a greater tendency to relapse when surgery is not performed properly,

with wide excision and margin of safety, thus, its treatment requires full resection with broad safety margin and immediate reconstruction whenever possible. The microvascular fibular graft is a good alternative for reconstruction of segments or even entire jaw, which restores the function, the aesthetics of the stomatognathic system, and allow implant-prosthetic rehabilitation.

In addition, it is recommended that a long period of clinical and radiographic follow-up, because recurrence may occur after a long period after treatment.

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