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Research Article

The Difficulty of Surgical Management of Mandibular Ameloblastoma: About 59 Cases

Mohamed Benchad[2]*, Mohamed Belhallaj[2] and Faiçal Slimani[1,2]

[1]Faculty of Medicine and Pharmacy, University Hassan II Casablanca, Casablanca, Morocco

[2]Department of Stomatology, Oral and Maxillofacial Surgery, 20 August 1953 Hospital, University Hospital Center Ibn Rushd of Casablanca, Casablanca, Morocco

***Corresponding Author:** Mohamed Benchad, Department of Stomatology, Oral and Maxillofacial Surgery, 20 August 1953 Hospital, University Hospital Center Ibn Rushd of Casablanca, Casablanca, Morocco.

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Abstract

Ameloblastoma is a dysembryoplastic tumor with dental origin. It is characterized by a slow evolution and a local aggressivity. Two surgical attitudes can be discussed: a conservative or radical one. The aim of this study is to draw conclusions about these two attitudes.

Our work is a retrospective study, including 59 cases of mandibular ameloblastoma, collected at the department of maxillofacial surgery of the University Hospital Center of Casablanca over a period of 13 years. The average age of our patients is 31.7 years. The diagnosis was suspected clinically and by imagery. 67.8% of our patients had an interrupt resection and 32.2% a tumor enucleation. The surgical reconstruction was performed by an iliac crest graft in 25.4% of cases, costal graft in 20.32% of cases and free fibular flap in 18.6% of cases. Infectious complications of the bone graft were recorded in 10.16% of the cases. 12 patients had recurrence. No case of malignant degeneration was noted.

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Ameloblastomas are benign tumors with aggressive local development. In 80% their location are in the mandible. Their degeneration is exceptional. Their evolution is slow, with no clear symptoms, leading to a diagnosis of the tumor, often late. The treatment is exclusively surgical, justifying a wide excision to avoid recurrences.

There is no consensus on therapeutic modalities. Radical treatment provides the best chances of recovery and less With conservative technique, recurrence is common and morphological sequelaes are uncommon.

Keywords: *Ameloblastomas; Radical Surgery; Conservative Surgery; Recurrences*

Introduction

Ameloblastoma is a benign neoformation with evolutionary and local invasive potential. It originates from the odontogenic epithelium and develops within a fibrous stroma without reproducing in its calcified tissues [1]. It accounts for only 1% of all maxillary tumors and about 11% of odontogenic tumors [1-4].

The radiology allows to orient towards the diagnosis, and specifies the degree of local extension. Surgical treatment may be conservative or radical. Conservative treatment is at risk of recurrence.

We try through a series of operated patients at the stomatology and maxillofacial surgery department of Casablanca for mandibular ameloblastomas, to report the clinico-épidemiological and radiological features of ameloblastomas, share our experience in its treatment field, draw some conclusions about the surgical attitude of these tumors, and compare the results of radical surgery to those of the conservative.

Methods

This retrospective descriptive study took place in the department of stomatology and maxillofacial surgery of Casablanca over a period of 13 years from 2004 to 2016. The study has included any patient presenting clinically, radiologically and/or histologically a mandibular ameloblastoma. Patients who did not accept medico-surgical management were not included. All patients benefited from a radiological assessment (orthopantomogram, facial computed tomography). The main data were collected from medical records, then analyzed with SPSS software. A data collection sheet has been focused on age, gender, antecedents, tumor location, radiological features, type of surgery, histology and evolution.

Results

During the study timeframe, and according to our required criteria we selected 59 patients with mandibular ameloblastoma. The mean age was 31.7 years with extremes of 17 years and 62 years (Figure 1).

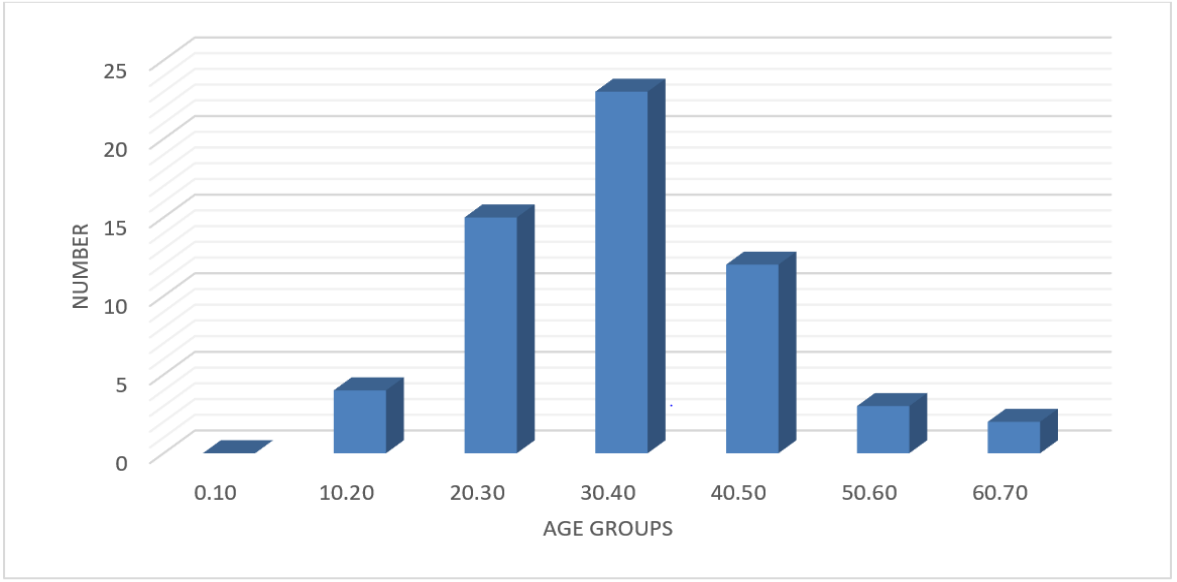

Figure 1: *Distribution of cases by age group.*

The sex ratio was 0.59 with 22 men and 37 women. The time limit before consultation fluctuated from 1 month to 6 years with an average of 15 months. The symptoms leading to consultation were mandibular tumefaction in 52 patients (88.13%), displacement or dental fall in 25 patients (42.37%) and pain in 15 patients (25.42%). The preferred site was the horizontal limb with the ramus in 23 patients (39%), followed by the horizontal limb alone in 20 patients (33.9%) (Table 1). panoramic radiography indicated to all of our patients showed in 43 patients (72.88%) a bone lysis feature polycyclic, finely partitioned into soap bubbles, other aspects of unikystic images, dental inclusion, and Cortical lysis were identified (Table 2). All patients benefited from CT examination.

Location	Number of cases	Percentage
symphysis	5	8,4%
Horizontal branch	20	33,9%
Horizontal branch and ramus	23	39%
Hemimandible	11	18,7%

Table 1: *Distribution of the patient population according to the anatomical location of the tumor.*

Radiological aspect	Number of cases	Percentage
Soap bubble	43	72,88%
Unicyst	16	27,12%
Dental inclusion	13	22%
Cortical lysis	18	30,5%

Table 2: *Distribution of radiological aspects of the tumor.*

Our patients, all operated, benefited from:

- Hemimandibulectomy for 22 patients (37.28%).
- partial resection of a mandibular bone with tumor excision for 18 patients (30.5%).
- Tumor enucleation for 19 patients (32.2%).

In case of a radical attitude the surgical repair was made by (Figure 2):

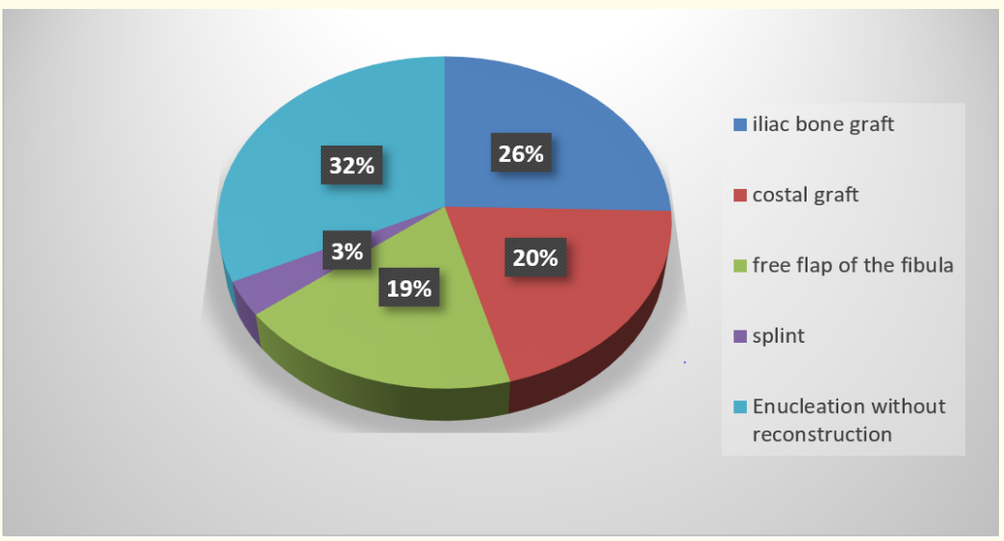

Figure 2: *Techniques of reconstruction of mandibular loss of substance adopted in our patients.*

- An iliac bone graft in 15 patients (25.4%).
- A costal graft in 12 patients (20.32%).
- One free flap of the fibula in 11 patients (18.6%).
- A splint in 2 patients (3.38%).

In all cases, the diagnosis of ameloblastoma was confirmed histologically. The histologic type found most frequently was follicular type in 38 cases (64.4%), cystic in 11 cases (18.64%) and follicular-cystic in 8 cases (13.55%) (Figure 3).

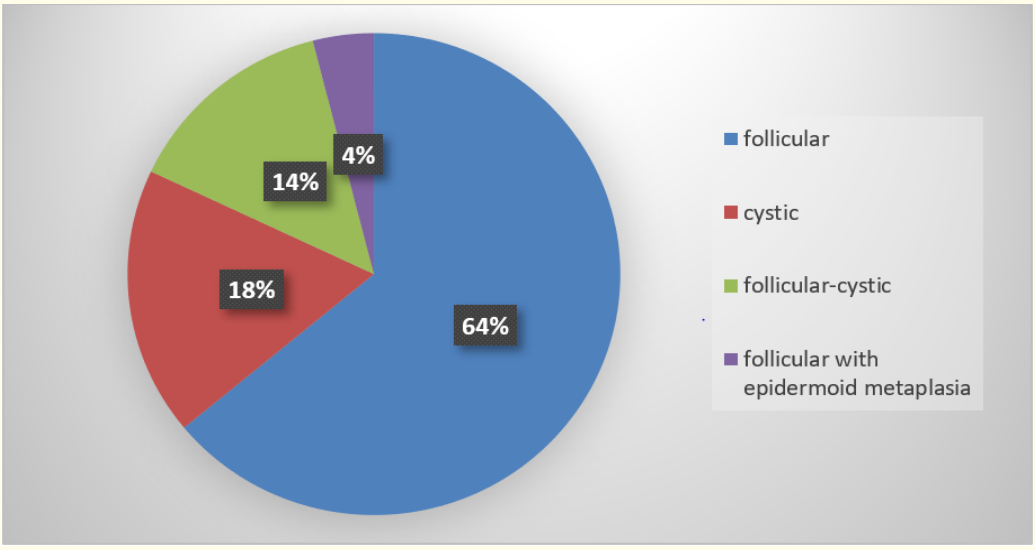

Figure 3: *Histological types found in our patients.*

Dental rehabilitation was performed in 45 patients (76.3%). It was provided by assistant prosthesis or implants. Antibiotics, analgesics and antiseptics were prescribed after surgery. The follow-up included consultation every month during the first year, every 6 months during the second year, and then once a year thereafter. Clinical controls have been completed using panoramic radiography. The evolution in the short and medium term were generally good over a variable period of 6 months to 6 years. 32 patients (54.23%) had labial-chin hypoesthesia, 10 patients (17%) had facial asymmetry most likely related to tissue retraction, 8 patients (13.55%) had a disorder of the dental joint and 4 (6.77%) a limitation of mouth opening. 12 cases had a recurrence (20.33%). No cases of malignant degeneration were seen.

Discussion

Ameloblastoma is a benign tumor that accounts for 1% of maxillary cysts and tumors [1-3]. Despite its undeniable structural benignity, it is considered a tumor with strong local aggressive and invasive potential. it remains in the mandible in 80% of cases [1-3,5]. It has a predilection for young adults with no predilection for sex, and it seems that the disease is more common in black race [6]. The signs of ameloblastoma are generally late. The discovery is often made during a dental check-up or a panoramic X-ray. It is sometimes the abnormal mobility of a tooth, a disorder of the dental joint or a recent pain that brings the attention to it [7]. The most frequent localization is the horizontal branch followed by the angle, the ramus , the parasymphysis and the mandibular symphysis, which has been also observed in our patients. The multilocular radiological appearance of soap bubbles is the most characteristic of ameloblastoma, often with an included

tooth [2]. The cystic forms are the most frequent [2]. Various therapeutic have been proposed. Surgery is the chosen way by the majority of authors [2-8]. There are two methods: conservative (enucleation) and radical (resection of the tumor or interruptive resection) [8].

The choice of conservative or radical treatment is a major concern of the maxillofacial surgeon whose goal is to eradicate the tumor in its entirety at a reduced surgical mutilation cost. There is no consensus on therapeutic modalities. Both surgical techniques are opposed. Conservative treatment consists of an enucleation-curettage of the tumor with maintenance of the periosteum for bone regeneration, especially in children. It seems appropriate in case of small unikystic tumor, well limited, with unbroken bone tables. Radical treatment consists of wide excision with healthy margins. It seems indicated in diffuse, ill limited and polycystic tumors.

The majority of authors seem to have endorsed the principle of radical treatment, which alone prevents any recurrence, any iterative surgical procedures more mutilating and carcinomatous transformation that becomes negligible [9,10]. It is the treatment of choice that ensures almost absolutely healing. The authors recommend a margin of 1.5 to 2 cm [11]. An exception will be made for unicystic forms that can be removed by enucleation and curettage provided that the excision is complete and leaves no fragment of the envelope in place.

Other authors [12,13], do not immediately condemn the conservative surgery. It allows patients to avoid the disadvantages of radical surgery with multiple repercussions: functional, cosmetic and psychological. It also provides patients a better socio-professional insertion because the sequelae of the intervention are minimal and constitute a way of waiting before a histological certainty. Its main disadvantages are the risk of recurrence and malignant degeneration [12].

Carlson demonstrates the inefficacy of conservative treatment [14]. Comparing the different recurrence rates, he found rates varying between 36 and 100% after conservative treatment, and between 0 and 21% after radical treatment. CHAPEL found rates varying between 90 and 100% after conservative treatment, and between 13 and 15% after radical treatment [15]. CERENEA has reported a percentage of 76% recurrence after enucleation [5] while TAKUMI has reported 48% [12] and Ruhin-Poncet reported 44% recurrence after conservative treatment [16].

Results from our study show a higher recurrence rate after conservative surgery (52.6%) than after radical treatment (5%), which correlates with data from literature and confirms the superiority of radical surgery in relation to the problem of ameloblastoma recurrent potential.

In our series and in general, we have had to perform an interruptive resection when the tumor is externalized, voluminous, even partially breaks a cortex or extends towards the mandibular condyle or towards the basilar margin or with a mandibular rod less than 7 millimeters. The localization of the tumor is also involved in the therapeutic choice: an incurrence of the mandibular incisor, for example, constitutes a tumor seeding pathway to the infra-temporal fossa indicating a radical treatment from the start [7-9].

We recommended conservative treatment for patients with a moderate volume tumor and facing thick unbroken bone tables [5]. Other criteria can take an important place: The young age of the patient, his general state, the evolution of the tumor and the possibility of monitoring and regular monitoring after conservative treatment.

Radiotherapy has been proposed by some authors. It seems that it should be reserved for malignant ameloblastomas and their metastases or inoperable forms [17,18].

The loss of substance generated by the tumor imposes a preferably an immediate reconstruction. Delayed reconstruction compromises functional outcome due to fibrosis, muscle retraction and inevitable cutanomucosal retraction. This reconstruction is a difficult surgical challenge. Mandibular reconstruction with vascularized bone flaps is today the chosen technique [18,19]. The most commonly used osteocutaneous flaps are those of the fibula, radius, scapula and ilium [19].

The results of the reconstruction can be assessed depending on aesthetic aspects (facial symmetry, aesthetic smile…) as well as functional aspects (chewing, swallowing, speech...) [18].

Given the potential for recurrence of this tumor, postoperative follow-up is essential. The surveillance should be spread out over a long period. This supposes a cooperation of the patient to respect the visits of control, prolonged in time [9-11]. In our series, 4 patients were have disappeared after conservative surgery.

Conclusion

Ameloblastomas are benign tumors with local evolution that only degenerate very exceptionally. The great variety of these formations lies on their latency and low noise evolution, which makes the discovery often late [1-3]. The treatment is exclusively surgical justifying a large excision to avoid recurrences that require uncertain and mutilating catch-up [7,20,21].

Conflict of Interest

The authors do not declare any conflict of interest.

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