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Short Case Report

Mandibular ameloblastic carcinoma: case report and literature review

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Abstract – Introduction: Ameloblastic carcinoma is an extremely rare malignant odontogenic tumor with predominantly mandibular localization. In most cases, it is treated surgically. **Observation:** Here, we describe a case of ameloblastic carcinoma. The patient presented a large expansive mass on the ascending branch of the left mandible, which was ulcerated and communicating with the oral cavity. He refused the proposed surgical treatment after being informed of the risk of facial decomposition. After several years, due to progressive symptomatology, he received palliative radiotherapy of 60 Gy divided into 30 sessions. Local control of the disease was achieved. **Discussion:** The efficiency of radiotherapy for ameloblastic carcinoma remains controversial. **Conclusion:** Radiotherapy appears to be a second-line approach when surgery is not feasible for ameloblastic carcinoma treatment.

Introduction

Ameloblastic carcinoma is an exceptional malignant tumor mainly occurring in the mandible. It may be primary or secondary to the transformation of a pre-existing ameloblastoma. Its prognosis is reserved because of its local aggressiveness and risk of metastatic expansion. Precise diagnosis is based on anatomopathological examination. The most common treatment is surgical via complete resection, followed by adjuvant radiotherapy. Here, we present the case of a patient with primary ameloblastic carcinoma treated with palliative radiotherapy; therapeutic approaches to this pathology in the literature are reviewed.

Observation

First consultation

A 73-year-old patient presented for consultation following discovery of a swelling of the left horizontal branch of the mandible. His case history was type II diabetes, rhizomelic pseudo-rheumatoid arthritis, and coronary artery disease. He was surgically treated for herniated disc and triple bypass. He had no allergies or significant family history. He was a former smoker (40 packs per year). Treatment included clopidogrel (Plavix®) 75 mg, glucophage (Metformin®) 850 ezetimibe + simvastatin (Vytorin®), ziloric (Allopurinol®), manidipine (Iperten®), and ramipril (Triatec®). He was previously biopsied and diagnosed with primary ameloblastic carcinoma located on the ascending left mandibular branch (Fig. 1); extension examniation was negative at the locoregional level and at a distance. The surgical team recommended resection surgery: dissection with fibula free flap reconstruction. However, the patient, in the view of the surgical risks and disfigurement, refused the surgery without follow-up.

Consultation at 5 years

He was examined for increased swelling and complaint of episodes of local infections and frequent intraoral bleeding from tumors. On endobuccal examination, a lesion with 15-mm diameter was detected behind the last lower left molar, which was bleeding on contact, painless, ulcerated, and communicating with the oral cavity. The tongue, floor of the mouth, tonsillar lodge, and veil seemed to be unaffected. There was no restriction in mouth opening, hypoesthesia in the left labiomental area, involvement of cranial nerve pairs, or palpable lymphadenopathy. Panoramic radiography (Fig. 2) and imaging (Fig. 3) revealed an expansive bone lesion of the mandibular angle and left horizontal mandibular branch,

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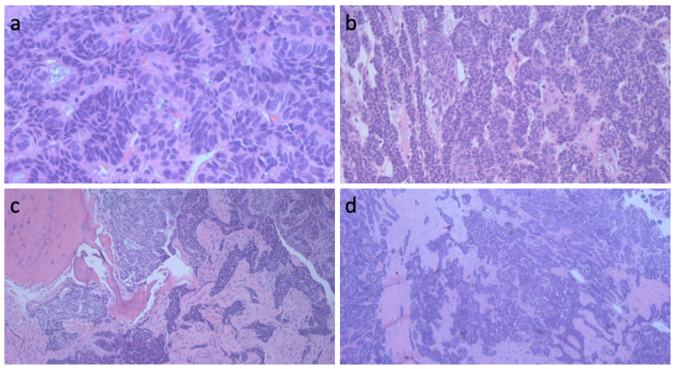

Fig. 1. Histological section of the biopsy showing cells with elongated nuclei assuming a palissadic appearance with clarified cells having an inverted nuclear polarity. The nuclei are the site of clear-cut nuclear atypia, and mitotic figures are visible. (a) Magnification ×50, (b) Magnification ×100, (c) Magnification ×200, (d) Magnification ×400.

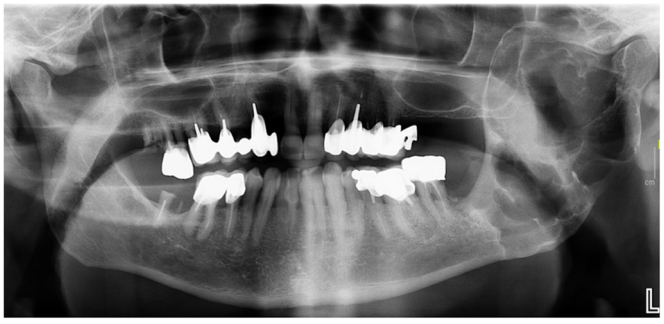

Fig. 2. Panoramic radiography showing diffuse osteolysis of the ascending branch of the left mandible 5 years after the first consultation. (Panoramic radiography showing diffuse osteolysis of the ascending branch of the left mandible 5 years after the first consultation.)

invading the cortical layer, with gaseous content, and measuring $60 \times 45 \times 37\ mm^3$. The lesion spared the condyle, parotid, and submaxillary gland. Extension examination revealed a single adenopathy of the ipsilateral facial pedicle, which was not very specific.

Surgery with reconstruction using microanastomosed fibula flap was proposed again, but after Multidisciplinary Consultative Meeting and given his arterial condition, radiotherapy for tumor control was proposed. The patient was again lost to follow-up.

Consolation at 6 years

One year later, magnetic resonance imaging (Fig. 4) revealed a larger lesion, measuring $75 \times 55 \times 54\ mm^3$, near the base of the skull, in contact with the parotid gland and invading the masticatory space.

The patient's general condition was preserved. Clinical examination showed a clear progression of the tumor with increased face deformation. At the intraoral level, there was a large necrotic cavity behind the 36, which bled spontaneously.

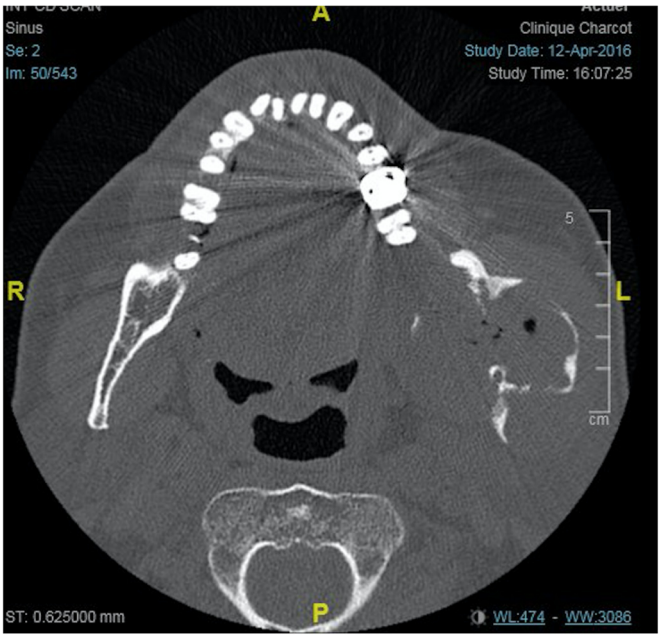

Fig. 3. Scan of facial bone window and in axial section at the mandibular level, at 5 years, showing an osteolytic and expansive lesion of the ascending branch of the left mandible. (Scan of facial bone window and in axial section at the mandibular level, at 5 years, showing an osteolytic and expansive lesion of the ascending branch of the left mandible.)

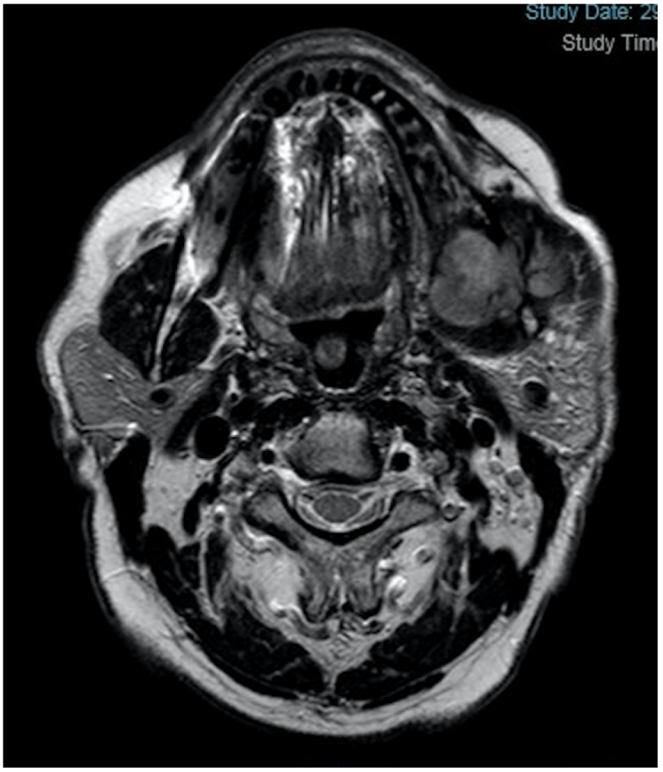

Fig. 4. T1 time MRI in axial section, at 6 years, through the mandible, showing the expansive process in relation to the ascending branch of the mandible. (T1 time MRI in axial section, at 6 years, through the mandible, showing the expansive process in relation to the ascending branch of the mandible.)

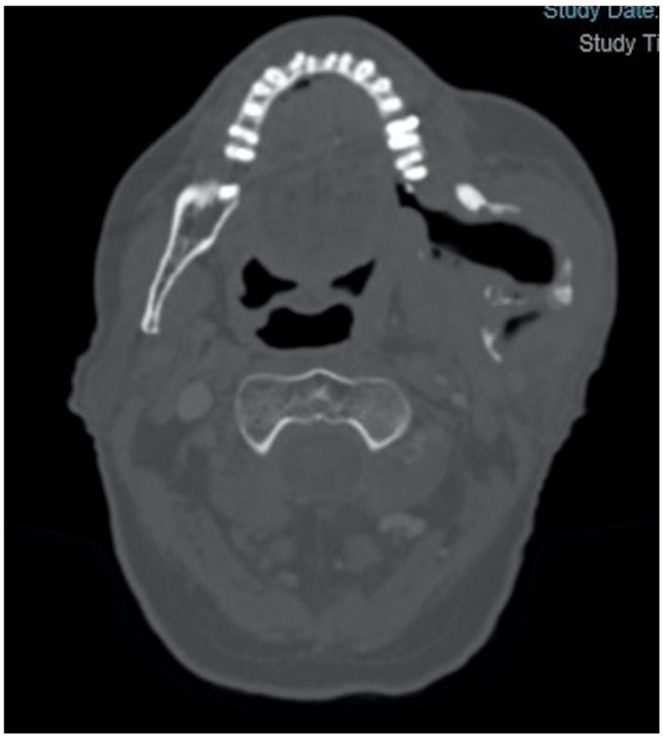

Fig. 5. Facial scan (bone window) in axial section 1 year after radiotherapy showing a stabilization of this expansive process and communication with the oral cavity. (Facial scan (bone window) in axial section 1 year after radiotherapy showing a stabilization of this expansive process and communication with the oral cavity.)

After further discussion with the patient, he refused surgery (which corresponded to the reference treatment) once gain and requested "to stop bleeding." Therefore, a conventional external radiotherapy for local and hemostatic control was proposed.

Radiotherapy was delivered 60 Gy divided in 30 sessions (2 Gy per fraction, 5 weekly fractions). At the end of irradiation, the patient reported excellent tolerance, despite known side effects, as well as disappearance of bleeding. Six months later, his general condition was preserved and he was asymptomatic. Clinical examination revealed improvements with mucosal healing, suggesting a single arch sequella. The patient only complained of hearing loss on the left side.

Consolation at 7 years

One year after radiotherapy, follow-up imaging (Fig. 5) showed a relatively stable tumor ($75 \times 45 \times 39$ mm^3), pushed back parotid without invasion, decreased local circumferential tissue component, and lack of ganglionic encroachment. A quarterly follow-up has been initiated.

Discussion

Ameloblastic carcinoma is an extremely rare epithelial tumor of odontogenic origin located in the mandible or maxilla, with a predilection for the mandible [1]. There are little data on this pathology because few cases have been reported. According to a meta-analysis of 199 cases in 2017, ameloblastic carcinoma occurs primarily at the age of ~40 years, with 2.4-fold male dominance [1]. It may be primary or secondary to pre-existing benign ameloblastoma, as described by Lin *et al.* [2]. Primary ameloblastic carcinoma is the most common. Clinically, it can manifest as pain, rapidly growing swelling, bleeding, ulceration, tooth mobility, trismus, labiomental paresthesia, dysphonia, or dysphagia [3]. Histological examination is pivotal to confirm diagnosis. It is a malignant epithelial tumor that retains the characteristics of ameloblastic differentiation but also shows cytological characteristics of malignancy [3]. For diagnosis, most studies use immunohistochemical analysis of Ki67—a frequently elevated marker in ameloblastic carcinoma—which is an index of tumor proliferation [4–7]. This is an additional aid for the differential diagnosis of ameloblastomas. Bello *et al.* [5] have examined different epithelial and stromal prognostic markers for ameloblastic carcinoma and solid multicystic ameloblastoma and concluded that Ki67 expression is significantly higher in ameloblastic carcinoma than in ameloblastoma. In the present case, histological examination was conducted outside the hospital monitoring facility and did not report assessments of any of these markers. There is no histological distinction between primary and secondary ameloblastic carcinoma. In 2005, the World Health Organization classification included ameloblastic carcinoma in ameloblastic tumors and described three subcategories: primary, secondary, and peripheral types. The new classification of odontogenic lesions in 2017 (4th edition) [8] (Fig. 6) reclassified it in the group of malignant odontogenic tumors discarding the previous subcategories, which are considered a morphological continuum because of their similar behavior. Imaging is non-specific and only has diagnostic value in locoregional extension examination. Management remains controversial, although surgery with healthy margins of exeresis offers the best prognosis and remains the treatment of choice. Most studies are in favor of surgery, followed by radiotherapy. Giridhar *et al.* [1] have shown that tumor resection with healthy R0 margins was associated with favorable survival without the need for adjuvant radiotherapy, except in older people who present more risk factors. The effectiveness of radiotherapy remains controversial. Jensen *et al.* [9] have shown complete remission of the disease with high dose of radiation (60 Gy) and concluded that it offered an alternative to surgery. According to retrospective study of radiotherapy alone for recurrence (old surgery) and adjuvant radiotherapy after surgery [10] in 2016, radiotherapy offered the potential for disease control when exeresis margins were affected or when recurrence was noted. In other studies [6–11], this approach was reportedly ineffective. In our case, radiotherapy seemed to have stabilized the course of the disease, as seen on the last scan. However, decreased hearing acuity seemed to be a complication of radiation therapy and not tumor progression given the absence of radiological evolution of the tumor. The tumor evolves via either a rapid and aggressive local extension or a distant metastatic lesion, particularly pulmonary, appearing in the 4th to 12th month after the surgery [6]. The bone, liver, and brain are other metastatic sites. The

Table I: 2017 WHO classification of odontogenic tumors and cysts

Malignant Odontogenic Tumors
Ameloblastic carcinoma
Primary intraosseous carcinoma, NOS
Sclerosing odontogenic carcinoma
Clear cell odontogenic carcinoma
Ghost cell odontogenic carcinoma
Odontogenic carcinosarcoma
Odontogenic sarcomas
Benign Odontogenic Tumors
Epithelial Origin
Ameloblastoma, conventional
Ameloblastoma, unicystic type
Ameloblastoma, extraosseous/ peripheral type
Metastasizing (malignant) ameloblastoma
Squamous odontogenic tumor
Calcifying epithelial odontogenic tumor
Adenomatoid odontogenic tumor
Mixed (Epithelial-Mesenchymal) Origin
Ameloblastic fibroma
Primordial odontogenic tumor
Odontoma
Compound type
Complex type
Dentinogenic ghost cell tumor
Mesenchymal Origin
Odontogenic fibroma
Odontogenic myxoma/myxofibroma
Cementoblastoma
Cemento-ossifying fibroma

Fig. 6. Table of the new 2017 classification of odontogenic tumors [8].

prognosis is reserved, with a high recurrence rate [7] and overall survival rates of 87.16% and 69.08% at 2 and 5 years, respectively [1]. Careful long-term follow-up is, therefore, essential in the management of this tumor [11].

Conclusion

For ameloblastic carcinoma, surgery remains the treatment of choice to date, sometimes combined with adjuvant radiotherapy, because it offers the best survival potential and prognosis. The effectiveness of radiation therapy remains controversial across various studies; however, this could be an alternative to surgery when it is not feasible and could provide good local control of the disease, as presented in this clinical case.

Conflicts of interests: The authors declare that they have no conflicts of interest in relation to this article.

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