Ameloblastoma. A case report

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Case Report

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Background: Ameloblastoma is a benign but locally aggressive odontogenic tumor that frequently requires extensive segmental resection. Titanium plate reconstruction represents an effective alternative for restoring mandibular continuity when microvascular procedures are limited.
Objective: To describe the clinical and reconstructive rationale for hemimandibulectomy followed by titanium plate reconstruction in patients with ameloblastoma.
Methods: A narrative review based on recent literature and contemporary surgical principles.
Results: The titanium plate provided mechanical stability, restoration of mandibular contour, and the possibility of delayed rehabilitation. Complications included plate exposure, infection, and loosening of fixations.
Conclusion: Titanium plate reconstruction is a viable and effective option in the initial management of mandibular defects caused by ameloblastoma, especially in contexts where free flaps are not feasible.

Keywords: Ameloblastoma, Mandibular reconstruction, Titanium plate.

Ameloblastoma accounts for 10–15% of odontogenic tumors, with a high predilection for the posterior region of the mandible and a locally aggressive behavior that favors recurrence if treatment does not include adequate oncological margins (1,2). Conservative techniques have high recurrence rates, which is why segmental resection remains the standard for extensive solid or multicystic lesions (1,3).

Hemimandibulectomy creates a bone defect that compromises occlusion, facial contour, mastication, and phonation; therefore, immediate reconstruction is essential to preserve function and aesthetics (4). Although microvascular bone flaps are the ideal reconstructive treatment for large defects (5,6), they are not always feasible due to patient comorbidities, institutional limitations, or treatment choices.

In these contexts, reconstruction with a titanium plate allows for the restoration of mandibular continuity with less surgical morbidity and reduced operating time, while also preserving space for a delayed definitive reconstruction if required (3,7). Titanium offers high biocompatibility, mechanical strength, and reliability in segmental defects (8). This paper reviews the principles, indications, and expected results of hemimandibular reconstruction with a titanium plate in patients with ameloblastoma.

Case report

We present the case of a 43-year-old female patient who came to the maxillofacial consultation due to a non-mobile, uniform, and approximately 5 cm diameter tumor in the right inframandibular region. A study protocol was performed with CT imaging studies (Figure 1), which demonstrated a tumor compatible with ameloblastoma in the right hemimandible region. She was scheduled for a surgical event with a complete pre-surgical protocol. A resection of the right hemimandible was performed via a right inframandibular approach (Figure 3). The prosthesis was fabricated using a sterile 3D printed model with a titanium plate and a titanium mandibular condyle prosthesis (Figure 4). It was verified with the contralateral hemimandible, and corrections were made to achieve the greatest symmetry and proper fit of the prosthesis in the joint in the articular fossa of the temporal bone. Once fabricated, osteosynthesis was performed on the mandibular symphysis using four 2.0 mm x 9 mm screws (Figure 5). The proper placement was verified, and the closure was performed in layers, thus concluding the surgical event.

Discussion

Ameloblastoma treatment should ensure clear margins to minimize the risk of recurrence, which can be elevated with conservative techniques such as enucleation or curettage (1,2). Segmental resection has proven to be the most effective technique for preventing recurrence, particularly in multicystic or solid variants (3,9). Immediate reconstruction with a titanium plate is indicated when the patient is not a candidate for free flaps, when surgical morbidity needs to be reduced, or when delayed bone reconstruction is part of the treatment plan (3,7,10). Reconstruction plates of 2.0–2.4 mm provide adequate stability to

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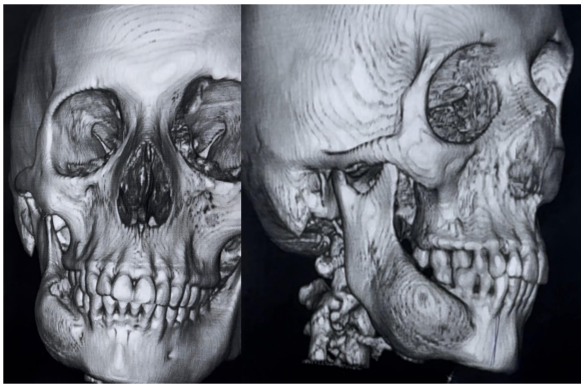

Figure 1. 3D tomography bone reconstruction showing a 6.5 x 4 cm tumor in the right hemimandubular region.

withstand moderate functional forces (11). Limitations and complications include plate exposure, infection, fracture, and screw loosening, which are common complications reported in the literature at rates of 10–30% (7,13,14). Defects larger than 6 cm present a higher risk of mechanical failure (3). On the other hand, computer-aided design and surgical guides allow for better plate adaptation, reduce surgical time, and improve functional and aesthetic outcomes (15). Functional restoration depends on multidisciplinary follow-up and the use of the plate as a bridge to secondary reconstructions when conditions permit (4,12). Immediate mechanical stability facilitates early rehabilitation of bite and speech.

Conclusion

Hemimandibular reconstruction with a titanium plate is an effective option for restoring mandibular continuity in patients undergoing ameloblastoma resection, especially when there are limitations to the use of free flaps. It offers mechanical stability, restoration of facial contour, and preservation of function, which was the objective in this particular case due to the extensive nature of the tumor. It can serve as a bridge to definitive reconstruction based on microvascular bone grafts; however, one of the limitations in this case is that it requires prolonged monitoring to detect complications associated with the material.

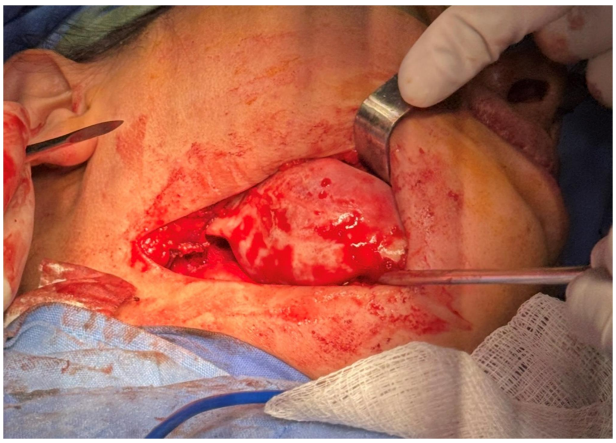

Figure 2. Inframandibular dissection and layered approach until the tumor is completely dissected

Figure 3. Final result of resection of right hemimandible completed.

Figure 4. Comparison of the hemimandible with the 3D model and the titanium prosthetic plate

Conflicts of interests

The authors have no conflicts of interests.

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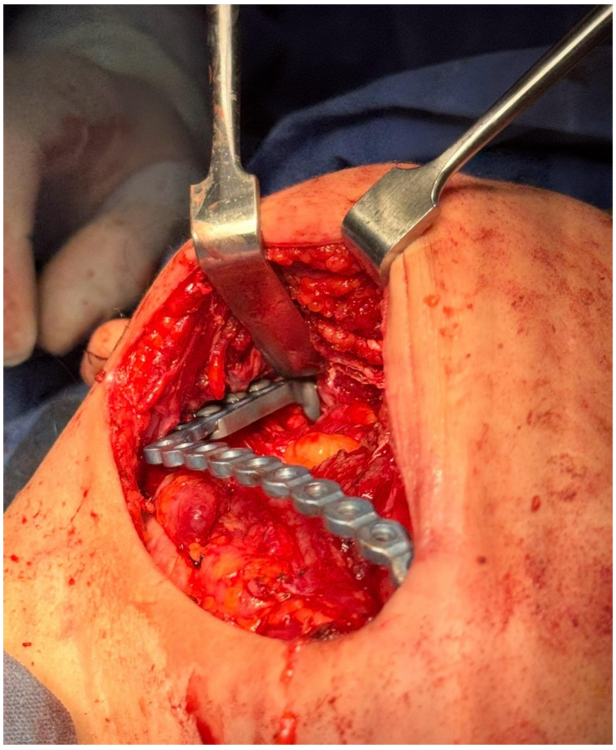

Figure 5. Final result of coupling the titanium plate to the temporal joint and the osteosynthesis in the mandibular symphysis

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