Mandibular traumatic peripheral osteoma: a case report

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An osteoma is a slow-growing, benign lesion comprising mature bone tissue. Osteomas rarely occur in maxillary bones, with the exception of the maxillary sinuses. Various possible etiologies have been proposed, including congenital anomalies, chronic inflammation, muscular activity, embryogenetic changes, and trauma. Here we present a case of an osteoma of the buccal plate of the mandible at the site where a sports-related traumatic injury occurred 15 years earlier. Both conventional and 3-dimensional x-ray examinations were used for diagnosis and preoperative evaluation of the possible involvement of the adjacent anatomic structures. The lesion was treated surgically without complications and the patient made a complete recovery. Histologic tests confirmed the preoperative diagnosis. A review of the international literature is also presented. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:e44-e48)

An osteoma is a benign lesion characterized by the proliferation of compact or spongy bone.1 Various etiopathogenetic hypotheses have been proposed for osteoma formation. Some1-3 have hypothesized that the lesion is caused by congenital anomalies. Another proposal, which is no longer held, was that chronic inflammation caused neoplastic proliferation.4,5 The development of these formations may be a result of trauma6 or embryogenetic changes. In addition, others7-10 have hypothesized that muscular traction contributes to neoplastic changes in the bone. The lesion has 3 forms: central, peripheral, or extraosseous. The central form derives from the endosteum and the peripheral form derives from the periosteum, whereas the extraosseous form develops in muscular tissue structures.10-12 This lesion has a higher prevalence in males with almost double the number of cases in men than in women.13,14 The peripheral form has particular growth characteristics that make it the easiest form to diagnose because it can be verified clinically and x-ray images are clear.3 Peripheral osteomas are mainly found in the frontal, ethmoid, and maxillary sinuses,15-17 whereas maxillary and mandibular bone sites are less frequent.9,10,14,18 In maxillary bone, however, osteomas are the most frequent lesion among those that form hard tissue.19 In mandibular bone, the lesions most frequently develop in the condyle, angle, and margin.3,20,21

Histologically, 3 types of osteoma can be identified: compact, spongy, and mixed22. When an exophytic lesion presents inside the oral cavity, still firmly fixed to the underlying bone and of a bony consistency, a differential diagnosis should be made between an osteoma or a more common exostosis. A peripheral osteoma can be distinguished from an exostosis on the basis of an accurate case history and clinical characteristics, but there are no histologic differences.22 Exostosis is a bony growth in the lingual plate of the maxillary bones, usually symmetric, well circumscribed, associated with inflammatory or traumatic phenomena, and characterized by limited growth. It has nothing in common with benign neoplasia.23,24 The term osteoma, therefore, is reserved exclusively for those lesions that demonstrate independent growth and clinical characteristics of benign tumors.22,25 The initial development of an osteoma is, with some exceptions,26 asymptomatic1,16 and osteomas are often identified incidentally on radiographs obtained to investigate the underlying causes of violent headaches, sinusitis, and rhinitis.27 The slow and progressive growth of osteomas causes subsequent swelling and an asymmetric appearance,16 which prompts clinical evaluation. On x-rays, the lesion is radiopaque with well-defined margins.28 Computed tomography (CT) scans should be obtained for a complete preoperative evaluation of the lesion.10,25
A peripheral osteoma can be completely cured by surgical intervention, and there is no recurrence.\textsuperscript{28,29} Surgery consists of removing the lesion at the base where it enters the cortical bone.\textsuperscript{8,9,28} The choice of therapy should be based on the general risks of the operation itself to the patient and the risk of damaging important anatomic structures adjacent to the lesion. In the present case, the mandibular and mental neurovascular bundles could be damaged during surgical resection of the lesion because of its close proximity to the mental foramen and nerve.

The purpose of this article is to add another case to the literature showing a clear association of a previous trauma with osteoma formation.

**CASE HISTORY**

The patient was male, aged 25 years, who presented with evident swelling of the right cheek. His previous history included trauma to the right mandible during a baseball game when he was 10 years old. The hematoma was notable. The lesion was noticed by the patient 5 years earlier and had shown slow and progressive growth until a visible deformity could be seen in the right genial zone, causing concern to the patient (Fig. 1). General clinical examination showed no changes in organs or systems, and laboratory tests were normal. Local examination showed a painless, cherry-sized swelling in the right mandibular zone. The swelling was of a hard bony consistency and was firmly attached to the mandible. There were no painful symptoms or lesions of the perioral skin or the oral mucosa. The patient could open his mouth normally without any deviations. A panoramic x-ray examination and posterior-anterior (PA) cranial x-ray examination, which revealed the bony origin of the lesion, were performed (Figs. 2 and 3). A CT scan was performed to allow for a more accurate diagnosis (Figs. 4-6) (CT scanner: Siemens Somatom Definition, Siemens Spa, Milan Italy; pixel size: 0.2441, field of view: 12.50, algorithm: H60s). The lesion was located in the mandible on the buccal plate, distal to the mandibular foramen, above the external oblique line. The maximum diameter of the lesion was approximately 1.5 cm. Radiographically, the lesion appeared typically sessile and mushroom-shaped with a narrow base that widened (Fig. 6). The base was 8 mm from the mandibular foramen, and the mandibular nerve did not appear to be involved (Fig. 5). The continued growth, together with the esthetic transformation and the patient’s concern, led to the decision to surgically enucleate the lesion. The operation was conducted by an intraoral vestibular incision to the mandible, with a paramarginal linear incision to elevate a full-thickness flap of the right-side incisor distal to the third ipsilateral molar. The edge was delicately freed with location of the mental foramen noted and isolation and protection of the neurovascular bundle. The lesion was located and completely exposed following the subperiosteal cleavage plane (Fig. 7). It was then resected at the base, first with the help of rotating instruments cooled with saline and finally with manual chisels. The procedure was completed with bone files at the residual site (Fig. 8). After surgical resection, the wound edges were stitched with 3/0 resorbable thread. Upon release from hospital, the patient was prescribed amoxicillin plus clavulanic acid (1 g every 12 hours for 4 days, Augmentin, GlaxoSmithKline S.p.a., Verona, Italy) and ketorolac as needed (maximum of 3 tablets a day, Toradol, Recordati S.p.a, Milan, Italy). The patient was
given precise oral hygiene guidelines. The healing was uneventful and no complications were observed (Fig. 9). Histologic tests confirmed the preoperative diagnosis and showed compact mature bone (Figs. 10 and 11). The postoperative follow-up consisted of an annual clinical check-up and x-ray examination (PA projection).

**DISCUSSION**

Only 4 cases of peripheral osteoma of certain traumatic origin are reported in the literature, 3 of which were at the mandibular angle\(^9,30\) and 1 in the lingual zone.\(^9\) In the present case, however, the lesion was located in the vestibular lower premolar zone, behind the mandibular foramen in correspondence with the end of the external oblique line. The continued slow growth and the site and asymmetry of the lesion led to a preoperative differential diagnosis of peripheral osteoma, which was confirmed histologically. A 3-dimensional CT scan allowed for better resolution and the location of the lesion was confirmed more precisely,\(^10,25\) excluding involvement of the bony wall of the mandibular canal, which was approximately 3 mm from the base of the neoformation.

Although removal of a peripheral osteoma is not compulsory, it was indicated in this case, both by the continued growth in a young patient and the esthetic implications of the patient’s obvious facial asymmetry.
Recurrence of peripheral osteoma after resection is extremely rare, and there are no reports of malignant transformation. In maxillofacial surgery, access to lesions in the lower jaw can be oral or cutaneous. In this case, oral access was selected to more easily locate the neurovascular bundle and for esthetic reasons. The tissue covering the osteoma was intact and well vascularized, and there was no inflammation. Histologically, the lesion was made up of well-defined, highly calcified bone tissue, which identified it as a compact osteoma.

Gardner syndrome must be excluded in patients with osteoma. This syndrome comprises gastroenteric polypus, skin and soft tissue tumors, skeletal abnormalities, such as osteoma and hypercalcification of the skull or the maxillary bones, and, finally, multiple embedded or supernumerary teeth. The differential diagnosis of oral and maxillofacial phenomena is essential because presentation in this zone precedes the formation of gastroenteric polyps, which have a certain malignant evolution.

The etiology of peripheral osteomas is not clear, and there are 3 theories of its origin: developmental, neoplastic, and reactive. The theory that a peripheral osteoma is a growth anomaly seems improbable because most cases are observed in patients no longer in a formative period of growth. The neoplastic theory contradicts the extremely slow growth. The reactive theory is the most likely in cases of confirmed trauma.

Our patient was a baseball player who clearly remembered having suffered a sports-related injury in the zone where the osteoma developed. It is therefore likely that the trauma provoked a subperiosteal hematic extravasation that led to a neoplastic degen-
eration of the tissues involved. The patient’s complete recovery and nonrelapse must be confirmed by long-term follow-up.

CONCLUSIONS

A peripheral osteoma of traumatic origin is a rare benign lesion of the mandible and few cases are reported in the literature. The presented case seems to confirm that the origin of the lesion was a trauma that had occurred 15 years earlier. An accurate preoperative study was performed using conventional and 3-dimensional radiographs and represented the base for a correct diagnosis and the surgical strategy. Although osteomas are benign lesions, long-term follow-up should be performed to confirm complete recovery.

REFERENCES


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