Myositis ossificans of the masseter muscle: A rare location. Report of a case and review of literature

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Abstract
Background: Myositis Ossicicans is a rare heterotopic bone formation within a muscle being the masticatory muscles exceptionally involved. In most cases there is a previous trauma, bearing in mind that there may be many other etiologies. CT scan and panoramic radiographs along with histological findings are essential diagnostic aids.
Case Description: we report a rare case of MO of masseter muscle in 49 years-old woman after repetitive wisdom tooth infection with the discussion of clinical, radiological and histological features.
Clinical Implications: MO is a rare disease of masticatory muscles being the masseter the most frequently affected. Wide surgical excision with free margins is the treatment of choice although close postoperative monitoring it’s essential to avoid relapses.

Key words: Myositis ossicicans, myositis ossicicans traumatica, masticatory muscles, masseter muscle, trauma.

Introduction
Myositis ossificans (MO) is also known as a Myositis ossificans traumatica (MOT) because in over half of the cases exists a direct relation with a single or repetitive injury of the muscle. The most accepted etiologic mechanism includes an osteoblast stimulation as a consequence of a bone or soft tissue damage causing a formation of new bone, dystrophic calcifications or calcified chondroid matrix. However, in approximately 25% of cases, there is no correlation with a trauma. Regardless of its origin, MO is a rare disease involving heterotopic ossification in the muscle or soft tissue (1-3).
The aim of this article is to report a case of a 49 year-old woman with MO located in the masseter muscle and a literature review about MO related to masticatory muscles due to the few reported cases.
Case Report
In April 2015, a 49-year-old female was visited at Maxillofacial Surgery department of Vall d’Hebron Hospital to assess the sudden appearance of a left paramandibular hard tumor accompanied by pain, swelling, progressive growth and difficulty in mouth opening during last 10 days (Fig. 1). She denied any medical history of interest but referred repetitive infection of her left wisdom tooth few weeks ago. An orthopantomography and a CT scan were performed (Fig. 2) that showed a well-defined calcification within the left masseter muscle suggesting a benign tumor of soft tissue. Due to define its histology an incisional biopsy of the lesion was done. The anatomopathological study reflected morphologic changes compatibles with myositis ossificans. No malignant signs were observed in the sample. Surgical removal of the tumor under general anesthesia was done by a left cervical approach (Fig. 3a). The lesion was exposed after a careful dissection and was excised, with 1cm of tumor-free margins, sacrificing the marginal nerve because it was totally surrounded by the MO (Fig. 3b). The definitive anatomopathological analysis described a central zone of bone tissue with abundant osteoblasts surrounded by mature bone tissue compatible with myositis ossificans (Fig. 3c-d). The edges of the sample were tumor free. At 3rd month postoperative the patient had no pain, a correct healing and a left marginal nerve paralysis.

Discussion
MO is the most frequent extraskeletal bone forming in larger muscles of the legs (1), especially in the quadriceps femoris and brachialis anticus, however, its location in masticatory muscles is uncommon with only 52 reported since 1924 to current date (2,3). The longest series of cases has shown a male predominance (M 2,5:1 W) with a mean age of appearance between 38-48 years (2,3). Regarding the location, masseter muscle is the most affected, followed by medial and lateral pterygoid...
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Trismus is the most frequent symptom of MO, as in our case (2,3). But other symptoms could be showed like pain, facial asymmetry or swelling. The absence of symptoms it’s also a possibility (8) and in some cases its diagnosis could be prolonged more than 20 years (9). A differential diagnosis should be done between others pathologies with similar clinical manifestations (Table 1). Diagnosis is made by radiological and histological study. Although orthopantomography isn’t the most effective study to determinate the extension of the lesion, it may aid with the identification of odontogenic infection focus (3). CT scan is the most useful instrument which can show a well circumscribed image with high-attenuating periphery and a low-attenuating central portion within muscle or soft tissues. The histological examination highlights an inner zone of proliferating fibroblasts and mitotic activity, an intermediate zone of developing osteoid cells and collagen trabeculae and an outer zone of mature bone separated from the surrounding muscle by connective tissue without inflammatory infiltrate (1,4,5,10). The term myositis ossificans is contradictory because the inflammation is absent and, if present, it is usually minimal and the muscle may not be involved. It is important to make a differential diagnosis with extraosseous osteosarcoma and parosteal osteosarcoma where greater cytologic atypia and aberrant mitosis are present. The histological features of our patient included a lobulated, well delimited and partially encapsulated lesion with peripheral mature laminar bone that formed...
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Table 1. Clinical differential diagnosis.

trabeculae. There was an intermediate area with osteoid material surrounded by osteoblasts and a central zone made of a cellular proliferation with mesenchymal features. Nor cytological atypia neither mitosis are seen in the lesion.

Surgical excision is the most consensual treatment, however, there are different opinions about if it is recommended an interval of 6 to 12 months after initial diagnosis before surgical treatment to allow a complete calcification of the lesion. On the other hand, about a third of cases resolve spontaneously, so it could be considered an expectant attitude (1). Some articles defend the use of interpositional materials, such as abdominal or buccal fat pads, with the aim of prevent relapse, hematoma or collapse after excision (1,6). Other authors have proposed a complementary treatment with drugs such as etidronate disodium -a biphosphonate commonly used as a prophylaxis and treatment of Paget’s disease which prevents aggregation, growth and calcification of crystals (4,7), nonsteroidal anti-inflammatory drugs, steroids, warfarin – a inhibitor of vitamin K products that reduces the production of osteocalcin which plays a significant role in metabolic regulation (1,6,11), and low-dose radiation. In our case, from diagnosis to definitive treatment we spent a total of 3 months and didn’t use any filling material or postoperative drug treatment. Nonetheless, a close monitoring of the patient is essential because the difficulty to establish a consensus about the most effective treatment due to the few published studies and their quality.

References