Intraosseous Lipoma of the Jaws: An Overview

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Background: Intraosseous lipomas (IOLs) are tumors of the medullary adipose tissue. They most commonly occur in the long bones and calcaneus, but rarely in the jaws. **Objective:** The main objective of this article is to review the main characteristics of IOLs with emphasis on the lesions located in the jaws. **Methods:** A literature review of the Pubmed database was done using the keywords: *intraosseous lipoma of the jaws; mandibular intraosseous lipoma; maxillary intraosseous lipoma*". Selection criteria included English written articles about humans (literature reviews, case series/reports). **Results:** 32 papers from the types literature reviews, case series and case reports were selected and reviewed for mandibular and maxillary IOLs. **Discussion:** IOLs are rarely found in the jaws and less frequently reported in the maxilla than in the mandible. The majority of cases are asymptomatic. In the others, patients may suffer from swelling, pain and paresthesia. Radiologically, they appear as well-defined osteolytic lesions with sclerotic borders centered in some cases by calcification. Histologically, IOLs present as mature adipose tissue, without cellular atypia, associated with variable degrees of necrotic fat and calcification. **Conclusion:** Clinical and radiologic examinations are important but the gold standard for accurate diagnosis remains the histopathological evaluation. Early diagnosis and accurate treatment consisting in surgical enucleation/resection, followed by long-term follow-up of the patient are essential to avoid any possible recurrence.

Keywords: jaws; intraosseous; lipoma; mandible; maxilla.

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1. BACKGROUND

Lipomas are common benign tumors composed of mature adipose tissue without cellular atypia (1,2). They may involve any part of the body where fat exists, especially the trunk and proximal extremities (3,4). In 20% of all cases they are found in the head and neck region (4) and in only 1-5% in the oral cavity (the cheek, the lips, the tongue, the palate, the vestibule and the floor of the mouth) (5-7).

Intraosseous lipomas (IOLs) are tumors of the medullary adipose tissue where fatty cells of bone marrow may accumulate to form a 'lipomatous mass' (2). They most commonly occur in the long bones and calcaneus, but rarely in the jaws (1,4).

2. OBJECTIVE

IOLs occurring in the jaws are rare. They present comparable clinical and radiological features as many other lesions making their diagnosis challenging for the dental practitioner. The main objective of this article is to review the main characteristics of these tumors.

3. METHODS

A literature review of the Pubmed database was done using the keywords: *intraosseous lipoma of the jaws; mandibular intraosseous lipoma; maxillary intraosseous lipoma*". Selection criteria included English written articles about humans (literature reviews, case series/reports).

4. RESULTS

32 papers from the types literature reviews, case series and case reports were selected and reviewed for mandibular and maxillary IOLs.

5. DISCUSSION

Lipomas are well-circumscribed, painless and slow-growing soft masses located in subcutaneous tissue, muscles, retroperitoneal space and bones (1,2). They mostly occur between the 4th and 6th decades of life. Lipomas are asymptomatic when they are subcutaneous, and may cause pressure-related symptoms when they are deep (4,8).

Intraosseous lipomas (IOLs) are benign bone lesions, accounting for less than 0.1% of primary bone tumors (2,4,9). Although considered rare, an increasing number of cases of IOLs have been reported in the last years raising the incidence in some studies to 2.5% (9-11). The literature revealed that IOLs usually occur in patients aged between 20 and 65 years (1). Their gender predilection remains con-

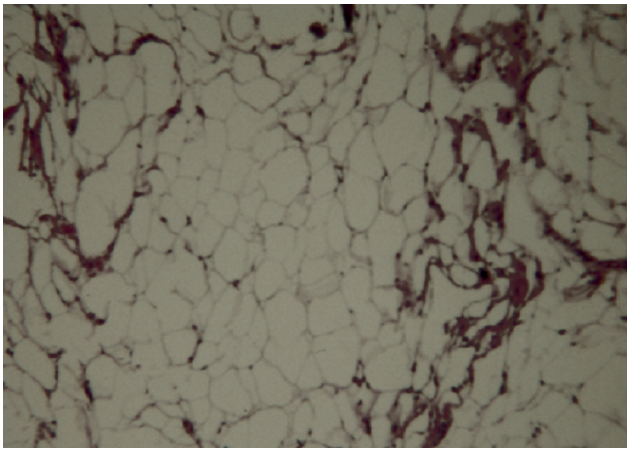

Figure 1. Histopathological section showing the mature adipose tissue

troversial; in some studies males are reported to be more frequently affected than females and in others no sex predilection was found. This is probably due to the difference in the sample size between these studies (9,12).

IOLs most commonly occur in the metaphyses of long bones such as humerus, radius, femur, fibula and tibia, as well as in the calcaneus and cervical vertebrae (4,5). They are rarely found in the jaws (1,2,4) and less frequently reported in the maxilla than in the mandible (13), with probably the first one described by Oringer, in 1948, involving the body of the mandible (14).

The symptoms of IOLs depend on the location and size of the lesion. The majority of cases are asymptomatic. In the others, patients may suffer from swelling, pain and paresthesia (1,2,8,15,16).

Radiologically, IOLs appear as well-defined osteolytic lesions with sclerotic borders in approximately all cases. Central calcification may be often seen (2,4,16). Computed tomography (CT) and magnetic resonance imaging (MRI) techniques can be helpful in detecting fat (viable/necrotic) and calcification within the lesion, therefore allowing a more precise diagnosis (16,17). MRI features of IOLs include, similar to adipose tissue, high signal intensity on both T1 and T2-weighted images (18).

As all IOLs, diagnosis of IOLs of the jaws is very difficult when based only on clinical and radiological features (1,4). Hence, a biopsy is obligatory to distinguish these lesions from others that may present comparable radiological images such as cysts, benign odontogenic tumors, chondromyxoid chondromas, fibrous dysplasia, metastatic tumors, and osteoporotic bone marrow defect etc (1,2,8).

Histologically, they present as mature adipose tissue, without cellular atypia, associated with variable degrees of necrotic fat and calcification (Figure 1). Based on the degree of evolution of the lesion, Milgram has proposed a histological classification divided into three stages. Stage one: lesion without secondary necrosis; stage two: lesion with partial secondary necrosis; and stage three: lesion with complete secondary necrosis (19).

Furthermore, in addition to the common form of lipoma, histopathological assessment may reveal two different types: fibrolipoma and angiolipoma. Fibrolipoma is when the lesion contains adipocytes and connective tissue, and angiolipoma contains, besides mature adipose cells, several blood vessels. The most common form of IOLs of the mandible described in the literature is the lipoma (4).

IOLs pathogenesis remains unclear; According to Hart, infarctions in bone-nourishing vessels result in their ischemia; the adipocytes that create lipoma-like substances accumulate in such areas (20). For Baker and Sloane, ILOs of the jaws may be the result of trauma, including tooth extraction (15). For other researchers, hyperlipoproteinemia may be considered as etiological factors (13). With regard to the mandible, histological studies have shown that with age, obliteration of the inferior alveolar artery principally supplying the mandible leads to areas of infarction where fat cells of the marrow may accumulate (2,15).

IOLs of the jaws were mostly reported in the posterior segment of the mandible (the posterior sector of the body, the angle, the ramus); there have been only very few cases located in the anterior segment described in the literature since 1948 (1,2,12). In the maxilla, cases in the molar region and the tuberosity have been described in the literature (21-23). The literature includes four cases of patients whose mandibular ILOs underwent malignant neoplastic transformation (1,2,15,24).

The treatment of choice for IOLs of the jaws is surgical enucleation. In case of extensive lesions, partial resection of the bone may be required; grafting decision following the surgery depends on the age of the patient, the size and location of the defect, and whether the patient is a candidate for removable dentures or implants. IOLs recurrence after surgery is uncommon (1,2,4,15).

6. CONCLUSION

IOLs of the jaws are rare, but may be incidentally found by the dental practitioner. Clinical and radiological examinations, including panoramic dental radiograph, CT scan, and MRI are very essential; however, the gold standard for accurate diagnosis remains the histopathological evaluation. IOLs early diagnosis and accurate treatment consisting in a surgical enucleation, or complete resection in case of large lesions, followed by long-term follow-up of the patient are essential to avoid any possible recurrence.

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