Acta Scientific Dental Sciences
Volume 2 Issue 3 March 2018
Case Report

Surgical Management of Solitary Mandibular Bone Cyst: A Case Report

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Received: January 04, 2018; **Published:** February 03, 2018

Abstract

The solitary osseous cyst is a rare lesion of jaws, classified among intra-osseous pseudocysts. It occurs most often at the time of the second decade, its privileged localization is the symphysis and the body of the mandible. Its typical radiological image might be unilocular, homogenous radiolucent lesion with clear and irregular or scalloped borders, making corticals thinner without interrupting them. It is generally asymptomatic and of casual discovery at the time of radiological exam. Surgical exploration confirms the diagnosis by the discovery of an empty cavity or filled with a sero-hematic liquid. The aim of this work is to illustrate a clinical case, diagnosis and surgical management of solitary osseous cyst.

Keywords: Solitary; Bone; Cyst

Introduction

A great variability in the denomination of solitary osseous cysts is found in literature: idiopathic cyst, essential cyst, traumatic osseous cyst, hemorrhagic cyst, hematic cyst, progressive osseous cyst, cystic osteodystrophia signing by even the in certainties concerning the nature and etiology of these pseudo-tumors.

The international histological classification of tumors by the WHO puts them among non-epithelial odontogenic tumors, and recommends the denomination of solitary osseous cysts [1].

They are an empty intra-osseous lesion or filled with serous, serohematic or bloody liquid, mainly found at the level of proximal part of metaphysis of children's and teenagers' bones [2]. The localization of solitary cysts in jaws is rare (frequency goes between 0.5 and 1% of all the cysts of jaw bones) [2]. They affect particularly the antero-middle part of the body of the mandible and exceptionally the jaw bone [2]. Solitary cysts cover the roots of teeth present on the arch, especially in the area of premolars, and mandibular molars [2]; a scalloped aspect of the high edge of the lesion which is attached in interradicular spaces without dental displacements or resorption is quite typical of solitary cyst, the same of conic form, with the head towards median line [3].

Case Report

A 19 years old mal patient with no medical history was referred to our oral surgery department for the extraction of wisdom teeth and diagnosis on a radiolucent image of mandibular symphysis discovered during a routine panoramic radiography (Figure 1). There was no associated clinical sign.

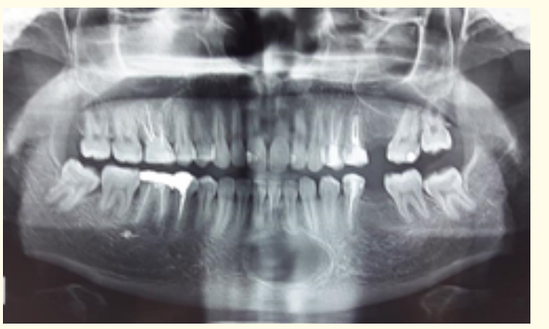

Figure 1: Panoramic radiograph showed a scalloped radiolucent image in the symphysis region extended from 42 to 34.

The radiolucency was homogenous and had a well-defined limits but discontinuous at the apex of 43, 42 and 41. The neighboring teeth were normal in pulpal tests, the overlying mucosal was normal and the endobuccal palpation was painless (Figure 2).

Figure 2: Intraoral picture showing a normal appearance of overlying mucosa.

Clinical and radiological exams gave rise to a keratocyst, an ameloblastoma or a solitary cyst.

A surgical exploration was made, carried out by a lifting of mucoperiosteum shred of 33 to 43.

The surgical approach had shown a thin layer of a vestibular osseous tissue opposite the lesion (Figure 3).

Figure 3: Mucoperiosteal flap in the symphysis region before trepanning a bony window.

The trepanning was done easily with bone cutter, allowing access to a pneumatized cavity, filled with blood, covered with a little membrane which was proved to be of conjunctiva nature after histologic examination (Figure 4).

Figure 4: Bone trepanning showing a bone cavity.

Postoperative symptoms were simple, with an edema and slight pains, relieved by aid of paracetamol. Clinical and radiological follow-up after six months showed an evidence of bone repair in progress with new bone tissue formation.

Discussion

The solitary bone cyst usually occurs on the second decade in the mandible without clinical symptomatology. All these data are in accordance with the elements reported in this case, since the patient was aged 19 and showed a solitary cyst found by accident, lodging in the horizontal side of the mandible.

Etiology

Among the multitude of theories on the etiology of this lesion found in literature, three principal ones are evoked.

Degeneration of benign tumor lesions

Several hypotheses evoke a tumor transformation during the development of fibro-osseous lesion [4-7], from the lesion of fibrous dysplasia's [8] or from low-grade infections [9].

The association of solitary osseous cyst and fibro-osseous lesions (most particularly florid periapical dysplasia's) seems to touch the most ageing patients [6] and could be explained by a decoupling of the osteoblastic and osteoclastic activity [6].

The theory "hemorrhagic intramedullar traumatism"

The traumatism causes the development of a hematoma in medullar spaces via rupture of capillary sinusoids, and we observe in most of the cases the formation of a clot. The liquefaction of the clot leads to the formation of the cavity which gets bigger by the increase of intra-cavity consecutive pressure to the decrease of venous or lymphatic drainage [10-12].

Disorder of the osseous growth

A disorder of osseous development allows explaining the preferential localizations of those pseudo-cysts near the conjugation cartilages [12].

At the mandible, the head of primary ossification is lodging at an immediate proximity of mental foramen, the anatomic region frequently affected by the solitary osseous cyst. Therefore, there is a probable relation between solitary osseous cyst and osseous remodelling.

Clinic

The solitary osseous cyst of maxillary is most often presented asymptomatically, and discovered by chance during routine radiography [3].

The semiology is most often absent, sometimes rough and a bit specific.

A few cases of pain and tumefactions were described [3,13].

The tests of vitality of the adjacent teeth are positive [14], signs of paresthesias being described in less than 3 % of the cases [15].

Radiology

Radiologically, the lesion seems generally in the form of unique, of weak extent, radioclear, homogenous image, surrounded by a thin edge of osseous condensation. Its borders are clear but irregular. Osseous cortical are thinner but not interrupted. However, the lesions of great extent may take on a multilocular aspect and can therefore be the origin of an error of diagnosis (keratocyst, ameloblastoma…) [16-20]. Intralesional septa can be presented within multilocular lesion [21,22]. The solitary cyst can be away from teeth or cover the roots of developed teeth which it doesn't generally resorb [21].

Histology

The histological exam is difficult in view of the absence of recoverable material.

The internal wall of the cavity seems to be upholstered of a thin conjunctiva layer, with an absence of epithelial wall.

The content of the cavity is variable, often pneumatized (especially in its mandibular localization), sometimes filled with a sanguine serous or sero-hematic fluid.

The content of the cavity seems related to the duration of the lesion's development, a period of long development allowing a progressive resorption of intracystic fluid, leading to empty cavities [23]. On most ageing patients, there may appear a tissue of granulation, having cholesterol granules and gigantic multinuclear cells [24].

Differential diagnosis

The differential diagnosis of certainty will necessitate most often a surgical exploration. Several lesions may resemble radiologically to solitary osseous cysts.

Apical, lateral or residual radiculo-dental cysts

Developed from pulpar necrosis, these lesions contain epithelial residues and cause the formation and the increase of a cyst by osmotic hyper-pressure. Apical and lateral radiculo-dental cysts are different only from their topography.

Ameloblastoma

Radiologically, it is represented most often by a typical aspect "in soap bulbs" which allows to differentiate it from a solitary osseous cyst ; whereas unicystic ameloblastoma may lead to confusion [25].

Odontogenic keratocyst

It is most frequently found between the second and fourth decade of life, may take on a multilocular aspect, with expansions and perforations of cortical, dental displacements and resorptions.

It is found frequently at the level of mandible (body and ramus), in relation to an impacted tooth [26,27].

Aneurysmal cyst

It shows osseous partitions along with radicular resorptions which allow to differentiate it from solitary osseous cyst from a radiological point of view [28,29].

Among the other differential diagnosis of solitary osseous cysts, we should also evoke: lack of Stafne, the central granuloma gigantic cells, residual cyst, arteriovenous malformations, the brown tumors related to secondary hyperparathyroidia and muco epidermoid carcinomas [27].

Therapeutic

Various treatment modalities are suggested for SBC. Follow up of an asymptomatic lesion and waiting for spontaneous regression, or curettage of the bone wall and induction of fresh bleeding into the cavities. Spontaneous resolution of the lesion due to organization of the formed blood clot is proposed as the normal sequel leading to complete resolution [30].

After the accomplishment of an incision and the detachment of mucoperiosteal shred, we carry out an osteotomy which consists of a perforation of the cortical under irrigation. The lesion is then washed abundantly with physiological serum, associated or not to a minute curette of the osseous walls. For the big cavities, if the spontaneous osseous regeneration is not done after the provoked bleeding, some authors recommend the filling of osseous defect by allogenic bone or other products to facilitate the osseous neo-formation [30-32]. There should be a clinical and radiological follow up as long as the ossification is not done.

Conclusion

The solitary osseous cyst constitutes a benign pseudotumor characterized by various localization in jaws.

Dental panoramic radiography presents an important interest for the discovery of solitary osseous cysts because they are must often asymptomatical and discovered by accident. The positive diagnosis is evoked intraoperatively in the absence of the cystic wall and the discovery of an empty cavity or filled with a serohematic liquid.

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