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Dentigerous cyst associated with complex odontoma

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Abstract
Dentigerous cysts are odontogenic cysts that arise by the accumulation of fluid between reduced enamel epithelium and the tooth crown. Typically, they affect impacted teeth, in the majority of cases mandibular third molars and maxillary canines. Occasionally, supernumerary tooth or odontoma are involved.
Odontomas are considered to be hamartomatous malformations rather than true neoplasms. They develop from epithelial and mesenchymal components of the dental apparatus, producing enamel and dentin.
In this article we report a case of dentigerous cyst associated with complex odontoma in a 15-year-old patient.

Keywords: dentigerous cysts, complex odontoma, treatment, radiological exam

Introduction

Odontomas are the most common odontogenic tumor. They are considered to be hamartomas rather than neoplasms, composed of the tissues native to teeth: enamel, dentin, cementum and pulp. They occur before the age of 30 with the peak in the second decade of life. There is no gender predilection. Clinical symptoms are uncommon and most lesions are detected on routine radiographs, however, an affected patient may present when a permanent tooth that fail to erupt. Rarely, an odontoma may erupt into the oral cavity. The etiology of odontoma remains unknown [1, 2, 3, 4, 5].

Dentigerous cysts are the second most common cystic lesion to affect the mandible. The term dentigerous means "containing tooth". They account between 15.2 and 33.7% of all odontogenic cysts. They are more frequent in patients between 10 and 30 years of age and in Caucasians, with male predilection [6, 7].

The aim of this article is to report clinical case of complex odontoma associated with cystic lesion which be treated at the department of Medicine and Oral Surgery of the Dentistry Clinic of Monastir, Tunisia.

Case report

A 15-year-old male patient was referred from department of pedodontics to our department due to one radiolucent-radiopaque lesion identified over right side of angle and mandibular branch on the panoramic film. The patient hadn't noticed any discomfort prior to the dental appointment and he had neither major systemic problems nor congenital hereditary diseases.

Extraoral examination yielded no abnormal findings on inspection and palpation of right mandibular bone. Intraoral examination show occlusal caries on lower right and left first molars, clinical absences of lower right and left second molars and upper left second molar. Also we note a soft swelling at the lower right second molar region, the overlying mucosa was normal (figure 1). There was no cervical lymph-node involvement.

Panoramic radiograph show, wisdom teeth to germ state, impaction of lower right and left second molars and upper left second molar, a large unilocular radiolucent-radio opaque lesion localized at the right angle and branch of the mandible, limited by a sclerotic border in relation to the germ of third molar and impacted of the second molar (figure 2). The cone-beam computed tomography (CBCT) of the mandible demonstrates a well-defined mixed hyperdense-hypodense lesion. We note a low-density area with massive radiopacity near the mandibular canal and expanded lingual cortical plate but bone cortex were not perforated by the lesion (figure 3).

Ossifying fibroma, calcifying epithelial odontogenic tumor, calcifying cystic odontogenic tumor, complex compound odontoma, dentinogenic ghost cell tumor, and adenomatoid odontogenic tumor were proposed as possible clinical-radiographic diagnosis.

Consequently, extraction of the third germ's molar, conservative enucleation of the lesion and curettage of the surrounding tissues were performed under local anesthesia. During the surgery, the lesion was easily removed, not showing any adherence to bone (figure 4, 5). The surgical specimen was sent for histological examination (figure 6).

Histopathologic examination revealed non-keratinized stratified squamous epithelium, underlying connective tissue which was moderately dense fibrocellular, with calcified material. Dentigerous cyst associated with complex odontoma diagnosis was retained.

The patient had been followed up for 6 months postoperatively and there was no recurrence noticed. The inferior alveolar nerve was preserved and the patient retained normal sensation.

Discussion

According to 2005 World Health Organization (WHO) classification of odontogenic tumours, there are two types of odontomas, compound (small tooth like structures) and complex (a conglomeration of dentin, enamel and cementum) odontomas. Clinically, they are classified as intraosseous (central), peripheral (soft tissue or extraosseous), and erupted odontomas [2, 4, 5, 8, 9, 10, 11].

The term odontoma was first coined by Broca in 1866, who defined it as a tumour formed by overgrowth of complete dental tissue. Odontoma has also been defined as 'tumour' that has developed and differentiated enough to produce enamel and

dentin. Odontomas are the most frequently occurring odontogenic tumors which constitute 22% of all the odontogenic tumors of the jaws, characterized by their slow growth and non-aggressive behavior. The etiology of odontoma is still unclear, despite several theories have been proposed, and various causes including trauma, infection, family history and genetic mutation have been postulated [1, 12, 13, 14, 15].

The frequency of complex variant constitutes between 5 to 30 % of all odontogenic tumors [1]. Usually they are located in the posterior mandible and the second most common site is the anterior maxilla. They are usually symptomless and often prevent the eruption of contiguous teeth; they are frequently discovered incidentally during routine radiographic examination. Sometimes it may include retention of permanent teeth, bone expansion, pain, and tooth displacement [1, 2, 4, 5, 8, 9, 14].

Odontomas present different stages of development which can be identified based on radiological features and the degree of calcification of the lesion. The first stage is characterized by radiolucency; the second stage shows partial calcification and the third stage exhibits predominant tissue calcifications with the surrounding radiolucent halo [4, 9, 12, 15].

Histologically, the odontoma is not a diagnostic dilemma. It is composed of dentin, cementum, pulpal tissue and enamel. However, mature enamel is lost during the decalcification processing and will not be seen on conventional hematoxylin and eosin stained slides. Complex odontomas consist of an irregular mass of mature hard and soft dental tissues, which has no resemblance to teeth [2, 5].

Odontoma has a limited growth potential, but it should be removed because it contains various tooth formulations that can predispose to cystic change, cause interference with eruption of permanent teeth and considerable destruction of bone. Odontomas can cause cystic degeneration, although this is considered to be a rare phenomenon [4, 9, 10]

The early diagnosis and management of odontomas is important because these are a major category of odontogenic tumors occurring within the jaws. Odontomas are usually managed by conservative surgical excision. Prognosis after treatment is very favorable, with rare risk of recurrence [3, 14].

Dentigerous cysts are odontogenic cysts that are attached to the cemento-enamel junction of the unerupted tooth. Occasionally they are associated with supernumerary tooth or odontoma. They are most frequently involve mandibular third molars and maxillary canines [1, 6, 7, 12, 16].

Dentigerous cysts are typically asymptomatic and are an incidental finding on routine radiographs. They are rarely painful and any pain suffered is associated with infection in the lesion. In some instances, these cysts can grow to very large size and affect the surrounding anatomical structure such as the mandibular canal, can trigger the inflammation, expansion and erosion of the cortical bone. They are solitary; however, multiple cysts may be seen with syndromes such as Gardner's syndrome, mucopolysaccharidosis, Maroteaux Lamy syndrome and basal cell nevus syndrome [6, 7, 16].

Radiographically, the dentigerous cyst usually occurs as a well-defined unilocular radiolucency, often with a sclerotic border. Three types of dentigerous cyst have been described radiographically: The central variety, in which the tooth crown is enclosed by the radiolucency, and the crown protrudes into the cystic lumen. The lateral variety in which the cyst occurs laterally along the tooth root, thus, partially surrounding the crown. The circumferential variety exists when the cyst not only surrounds the crown, but also extends down along the root surface, thus, giving the impression of the tooth within the cyst [6, 7].

The standard treatment for these cysts is the enucleation and the extraction of the affected tooth. However, if the patient is a child and the affected tooth is not developed, a more conservative attitude should be considered, such as marsupialization [6, 7].

Dentigerous cysts were diagnosed in conjunction with 27.6% of the odontomas [3]. Radiologically, this association appears as a mixed image containing radiolucent and radiopaque areas, with the differential diagnosis including calcifying cystic odontogenic tumors and ameloblastic fibro odontomas. Usually, they are asymptomatic and this delays the diagnosis. They together are a potential for complications like attaining large size, root resorption, destruction of the jaw bones and sometimes neoplastic changes like ameloblastoma. Prompt diagnosis and treatment is mandatory to prevent complications [4, 7, 17, 18, 19].

Conclusion

Simultaneous occurrence of pathologies like odontoma and dentigerous cyst are uncommon and their diagnosis based on the radiographic appearance alone is a challenge to overcome [17].

Fig 1: intraoral examination.

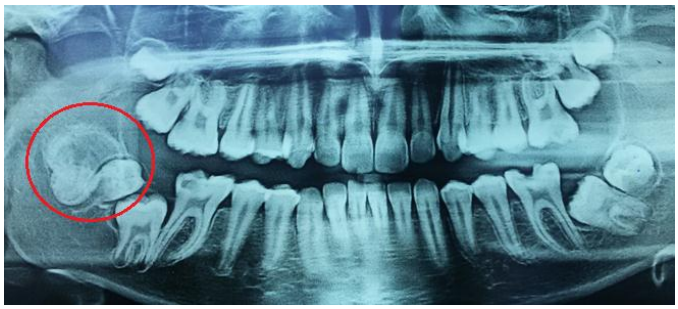

Fig 2: panoramic radiograph showing radio opaque-radiolucent lesions localized at the right angle and branch of the mandible, limited by a sclerotic border in relation to the germ of third molar and impacted of the second molar.

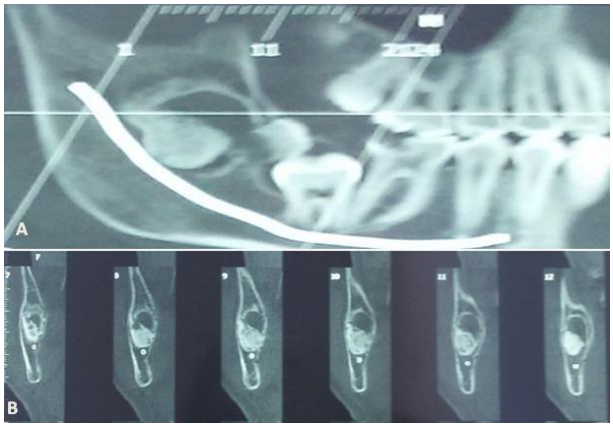

Fig 3: cone-beam computed tomography (CBCT) of the mandible demonstrated a well-defined mixed hyperdense/hypodense lesion: A: panorex, B: axial computed tomography scan.

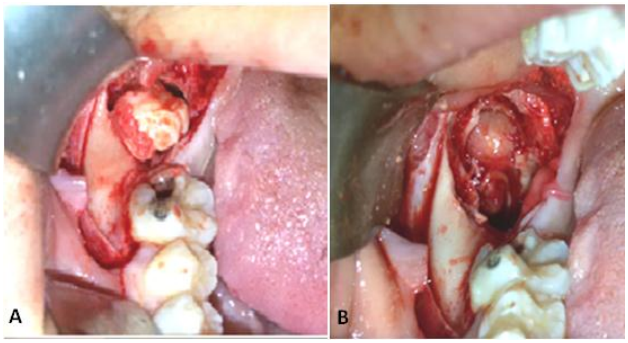

Fig 4: A: extraction of the germ of third molar.
B: operative cavity following to the extraction showing soft tissue.

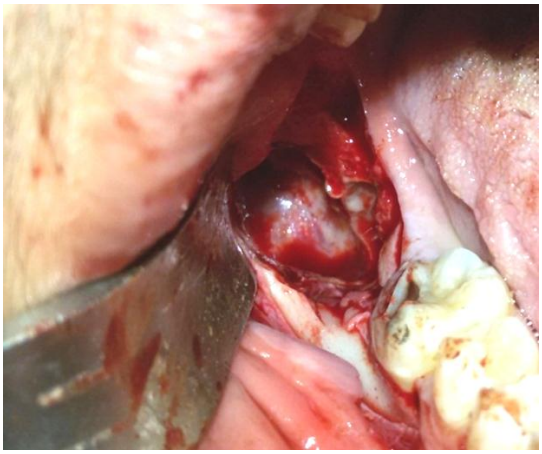

Fig 5: operative cavity following to the lesion removal.

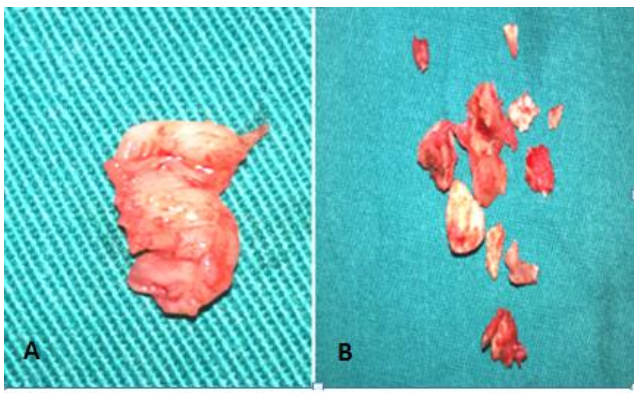

Fig 6: specimens: A: soft tissue. B: calcified tissue.

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