

## DENTIGEROUS CYST WITH AN IMPACTED CANINE: CASE REPORT

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### Abstract

Dentigerous cysts are the second most common developmental odontogenic cysts after radicular cyst. They usually present in the second or third decades of life and these cysts are rarely seen during child hood. Their frequency in the general population has been estimated at 1.44 cysts for every 100 unerupted teeth. According to frequency of impaction, the maxillary permanent canine ranks second only to the third molar, with a prevalence of approximately 2% in the general population. Impacted canines are positioned palatally 85% of the time. The frequency of impaction is three times greater in females than males.

In many instances the cyst may be asymptomatic till it attains a large size. It usually presents as a slowly enlarging, sometimes painful swelling; particularly if infected. At radiography, dentigerous cysts appear as well-defined, round or ovoid, corticated, lucent lesions around the crowns of unerupted teeth. The radiographic appearance of such dentigerous cysts is comparable with that of cystic, unilocular odontogenic keratocysts. Treatment includes extraction of the associated tooth and enucleation of the cyst. In this study we present dentigerous cyst that caused by impacted canine.

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### Introduction

After radicular cysts, the second most common are dentigerous cysts of odontogenic origin and account for about 16.6% of all such jaw lesions<sup>1,2</sup>.

They are usually asymptomatic but can become extremely large and cause cortical expansion and erosion. In 75% of the cases, they are located in the mandible. The mandibular third molar and maxillary canine are involved most frequently<sup>1,2</sup>.

Radiographically, the dentigerous cyst appears as a unilocular radiolucency of variable size with well-defined sclerotic borders,

associated with the crown of an unerupted tooth. Histologically, the dentigerous cyst displays a thin fibrous cyst wall with a myxomatous appearance. The epithelial lining consists of 2-4 layers of fat or cuboidal cells, which in fact is the reduced enamel epithelium and is characteristically non-keratinized.

Nests, islands or strands of odontogenic epithelium are often seen in the fibrous capsule. Localized proliferation of epithelial lining may occur in response to inflammation. Several treatment options existed, including removal of the cyst via enucleation; marsupialization of the cyst to the oral mucosa, with placement of a wire to allow for drainage and decompression of the cyst; decompression of the cyst via fenestration.

The aim of this study is illustrates a simplified surgical treatment for large dentigerous cysts with impacted tooth. The procedure can be performed in the office and provides the best chance to preserve.

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## Case Report

A 19 year-old female patient referred to our clinic with a complaint of swelling in the anterior maxilla. The patient's medical history was insignificant. No other abnormality was detected on complete systemic examination.

The patient reported that she had first noticed the swelling one year ago. Oral and radiologic examination showed the absence of left maxillary canine tooth. Panoramic radiograph showed that maxillary permanent canine was a radiolucency with a well-defined border which measured 2.0cm x 2.0cm, surrounding the left maxillary impacted canine. (Figure 1).



Figure 1. Preoperative panoramic view.



Figure 2. Surgical specimen.

In the left lower canine region a softly palpable, remarkable swelling was evident. The overlying mucosa was of normal color and appearance. Extra oral examination revealed that there is no hard bony expansion over laying the maxilla. The oral soft tissues were within normal limits, and inferior alveolar nerve function was normal. Fine needle aspiration biopsy showed a serious cyst liquid with cholesterol crystals.

The patient was further prepared for

enucleation of the pathology with a provisional diagnosis of dentigerous cyst arising from the impacted canine. On incision and reflection of the mucosa, a thinned maxillary cortex was evident with areas of perforation. The bone cavity was lined by a thick epithelium that was easily enucleated (Figure 2).

Impacted canine was removed along with the left lateral incisor and left first premolar that lacked sufficient bone support. The mucosa was then sutured. Post operative healing was uneventful. Biopsy specimen was sent for histopathological examination. The lesion was reported as dentigerous cyst (Figure 3).

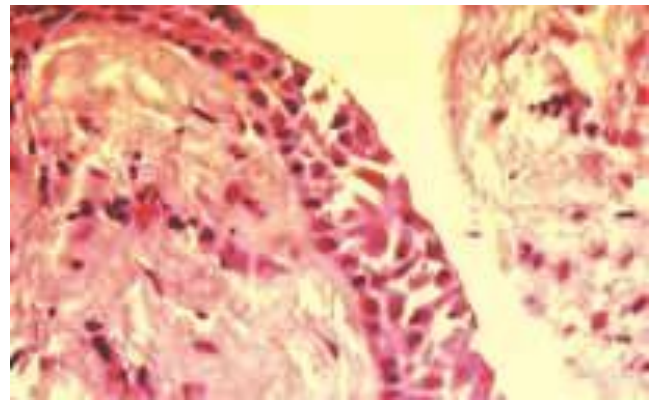


Figure 3. Histological view.

The patient was follow up for six months. In routine controls there was no problem and was also no evidence of recurrence of the cyst (Fig-4).



Figure 4. Postoperative panoramic view.

## Discussion

Teeth may be impacted or erupt ectopically for a variety of reasons. Hereditary factors, lack of space, persistence of primary canines, a true ectopic path of eruption, reduced root length and aplasia of lateral incisors are a few of the factors cited<sup>3</sup>.

Failure of eruption of the mandibular canine is an unusual event<sup>4</sup>. Mandibular canine impaction is regarded as a much rarer phenomenon, and there are limited numbers of studies revealing its frequency of occurrence<sup>5</sup>.

Grover and Lorton found only 11 impacted canines (0.22%) in the mandible in 5000 individuals<sup>6</sup>. Chu et al. reported five mandibular impacted canine (0.07%) teeth in 7486 patients<sup>7</sup>. A study by Rohrer examining 3,000 patients radiographically found 62 impacted maxillary canines (2.06%) and only three impacted mandibular canines (0.1%), a 20:1 ratio.<sup>8</sup> An another study by Aydin et al. involving 4500 Turkish patients, the incidence of mandibular canine impaction was 0.44%<sup>5</sup>.

Dentigerous cysts enclose the crown of an unerupted tooth, attaching to the neck of the tooth and grows by expansion of its follicle. It is classified as a developmental cyst by the World Health Organization<sup>9</sup>. In 75% of cases they are located in the mandible. The mandibular third molar and maxillary canine are involved most frequently.<sup>10</sup> The first is developmental in origin and occurs in mature teeth usually as a result of impaction. The incidence of cysts and tumours around impacted third molars is 3.1%<sup>11</sup>.

According to the literatures two types of dentigerous cysts occur. These cysts usually occur in the late second and third decades, are discovered on routine radiography, and predominantly involve mandibular third molars<sup>12,13</sup>.

The second type is inflammatory in origin and occurs in immature teeth as a result of inflammation from a nonvital deciduous tooth follicle<sup>12</sup>. These are diagnosed in the first and early part of the second decade either on routine radiographic examination or when the patient complains of swelling and pain<sup>14</sup>. Our cases classified as the first type of dentigerous cyst.

Dentigerous cysts are usually single lesions. Bilateral and multiple cysts have been reported in patients with syndromes such as basal cell nevus syndrome, mucopolysaccharidosis, and cleido cranial dysplasia<sup>15,16</sup>.

Bilateral mandibular dentigerous cysts have also been reported after prolonged concurrent use of cyclosporine A and calcium channel blockers. Gingival hyperplasia and impaired dentition are the most common features shared by most of these syndromes<sup>2</sup>. No

syndrome was detected in our cases.

It's known that panoramic radiography has a limited value for evaluating the margins and extension of the lesion. CT examination aid in delineating the extent of the lesion. The indications for CT examination of dentigerous cysts are not so familiar. Conventional X-ray methods /extraoral and intraoral/ give enough information for occasional findings- asymptomatic and without clinical signs dentigerous cysts. CT imaging displays bony details and gives exact information about the size, origin, content and relationships of the lesion involving the maxilla<sup>9,18</sup>.

The epithelial cells lining the lumen of dentigerous cysts are able to undergo metaplastic change to other epithelial cell types. The cyst's lining may contain areas of orthokeratinization, ciliated cells or mucin-secreting cells<sup>18</sup>. Because of this inherent ability for metaplastic change, some dentigerous cysts appear to progress to more aggressive lesions such as an odontogenic keratocyst, ameloblastoma, mucoepidermoid carcinoma or squamous cell carcinoma<sup>19</sup>. We performed long term follow up of our cases (approximately one year and still goes on) and no dysplastic changes were observed.

The histopathologic findings of dentigerous cysts vary depending on whether the cyst is inflamed. In the noninflamed variant, the fibrous connective tissue wall is loosely arranged with small islands of inactive odontogenic epithelial rests<sup>18</sup>. In our cases histological sections of specimens were similar, showing cyst walls composed of fibrous tissue and lined by stratified squamous, non-keratinized epithelium.

Treatment of dentigerous cysts depends on size, location, and disfigurement, and often requires variable bone removal to ensure total removal of the cyst, especially in cases of large ones<sup>20</sup>. However, cysts causing tooth displacement and involving loss of bone should be treated with marsupialization or decompression<sup>21</sup>.

In this method, new bone formation is stimulated because marsupialization decreases intracystic pressure. The major disadvantage of marsupialization is that pathologic tissue is left in situ, without a thorough histologic examination. Although the tissue taken in the window can be submitted for pathologic examination, there is a possibility of a more aggressive lesion in the residual tissue<sup>22</sup>. We preferred enucleation of the

cyst. Because the cyst is not as large as for using the method of marsupialization.

## Conclusions

These cysts are usually slow-growing lesions and may attain a considerable size with minimal or no symptoms. Ameloblastoma, mucoepidermoid carcinoma, and squamous cell carcinoma have also been reported to arise from the lining epithelium of dentigerous cysts, indicating the pluripotentiality of their cells. Early detection and removal of such cysts is therefore important to reduce potential morbidity.

As it is common to find an unerupted tooth as the only initial presenting symptom of a dentigerous cyst, it is important to undertake radiographic examinations of all such teeth that are well past their expected eruption date.

Despite the rarity of bilateral occurrence, once a dentigerous cyst has been identified, attempts must be made to rule out the presence of any co-existent lesions in other parts of the jaws.

## Declaration of Interest

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