# Dentigerous cyst associated with an upper permanent central incisor: case report and literature review

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*Traumas to deciduous teeth may have severe consequences. This article addresses a dentigerous cyst case report associated with an upper permanent incisor, unusual site of occurrence, which was impacted and dislodged from its natural site of eruption after trauma at the deciduous predecessor.*

*The main aspects of etiopathology and its clinical characteristics are also discussed, with especial focus on the radiographic features of the diagnosis in order to allow for an accurate surgical planning.*
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## INTRODUCTION

The dentigerous cyst represents 33% of all odontogenic cysts. It is generally associated with an impacted tooth and develops after the complete formation of the crown.[1] The classification by the World Health Organization of epithelial cysts related to the odontogenic apparatus refers to dentigerous or follicular cysts as an epithelial developmental odontogenic cyst.[2]

The diagnostic hypothesis of dentigerous cysts depends on a correct radiological identification of a space between the dental crown and the folliculus, as well as on the identification of such space during surgery.[3] The final diagnosis is only possible after the histological examination.

This article reports the case of a dentigerous cyst associated with an upper permanent central incisor, previously diagnosed as odontogenic tumor.

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## CASE REPORT

A systemically healthy female patient, XX years old, was referred to our office complaining of an increasing volume on the front side of the face, which caused pain and discomfort. Clinically, she presents great swelling on the right region of the maxilla and absence of the upper right permanent incisor, which was rehabilitated by an adhesive prosthesis. The patient brought us radiographic and computed tomographic exams, which were diagnosed as odontogenic tumor. (Figure 1). On those images we could see the presence of an osteolytic lesion in the maxilla within focal radiodense area and an expansion of the buccal bone cortical.

The patient reported the history of trauma to the face when still a child. The resulting absence of the upper incisor made the prosthesis necessary.

Other radiographic images were requested, e.g. occlusal, periapical, lateral and panoramic views as well as linear tomography. It was possible to identify the presence of an impacted tooth below the nasal floor associated with the osteolytic lesion. (Figures 2 and 3). The differential diagnosis of dentigerous cyst or odontogenic keratocyst was established.

The patient was submitted to oral surgery under general anesthesia for the enucleation of the lesion and removal of the associated impacted tooth. The rupture of the nasal floor mucosa that occurred during the surgery was immediately closed by resorbable suture (vicryl 5-0).

The post-surgery evaluation one year later revealed ossification of the region and absence of relapse. (Figure 4).

## DISCUSSION

The pathogenesis of dentigerous cysts is still controversial. Shear[4] advocates an inter-follicular origin in the

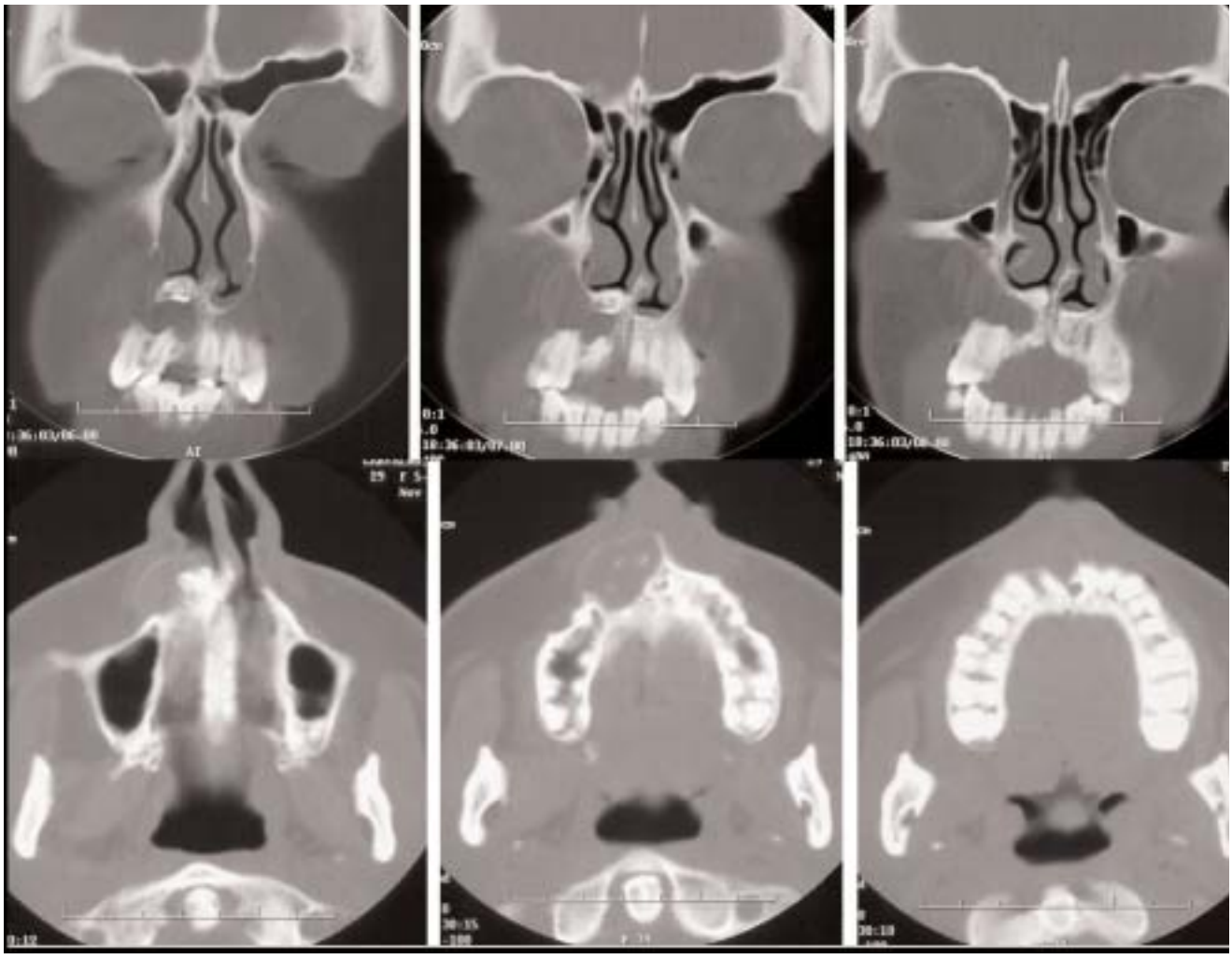

**Figure 1.** Preoperative Computed Tomographic (CT) Exams – Coronal and Axial CT showing the presence of the osteolitic lesion, with a "tumor-like" pattern with cortical expansion and a focal radiodense area into the lesion

development of the dentigerous cyst. He presumes that it starts with fluid accumulating between the reduced enamel epithelium and the enamel, or between the layers of the reduced epithelium and the enamel.

Inflammation at the apex of a deciduous tooth could lead to the development of an inflammatory follicular cyst around the permanent successor[5]. Toller[6] postulated that dentigerous cysts develop from the follicular proliferation, which would eventually lead to impaction, however the induction proliferation is not known. It appears that in certain cyst-prone individuals the cyst develops between the reduced enamel epithelium and the crown of an unerupted tooth and genetic factors are believed to contribute to the process.[7] Several studies have demonstrated that the dentigerous cyst tissue *in vitro* cultures secretes factors with bone resorbing activity, such as protaglandins[8] and interleukin-1.[9]

This reported case relates to a trauma to the deciduous central incisor when the patient was a child. At that time no diagnosis was made regarding the permanent central absent incisor impaction.

Killian *et al.*[10] remember that traumas to deciduous teeth can lead to odontogenesis disturbances on the permanent successor. Such disturbances can usually give rise to hypoplastic defects or crown / root disruption in permanent teeth or even deviations from the normal eruption direction. The author has reported a case of trauma to the upper deciduous incisor leading to an inflammation process in the apex of the deciduous tooth. This could have caused the reduced epithelium to proliferate and the permanent tooth enamel to develop the cyst.

The permanent teeth are more likely to be affected. However dentigerous cysts can develop from any impacted tooth-deciduous, supernumerary-and also from odontomas. The incidence is particularly high during the second and third decades of life, when third molars erupt.[11] Takagi and Kouama[12] report that 9.1%

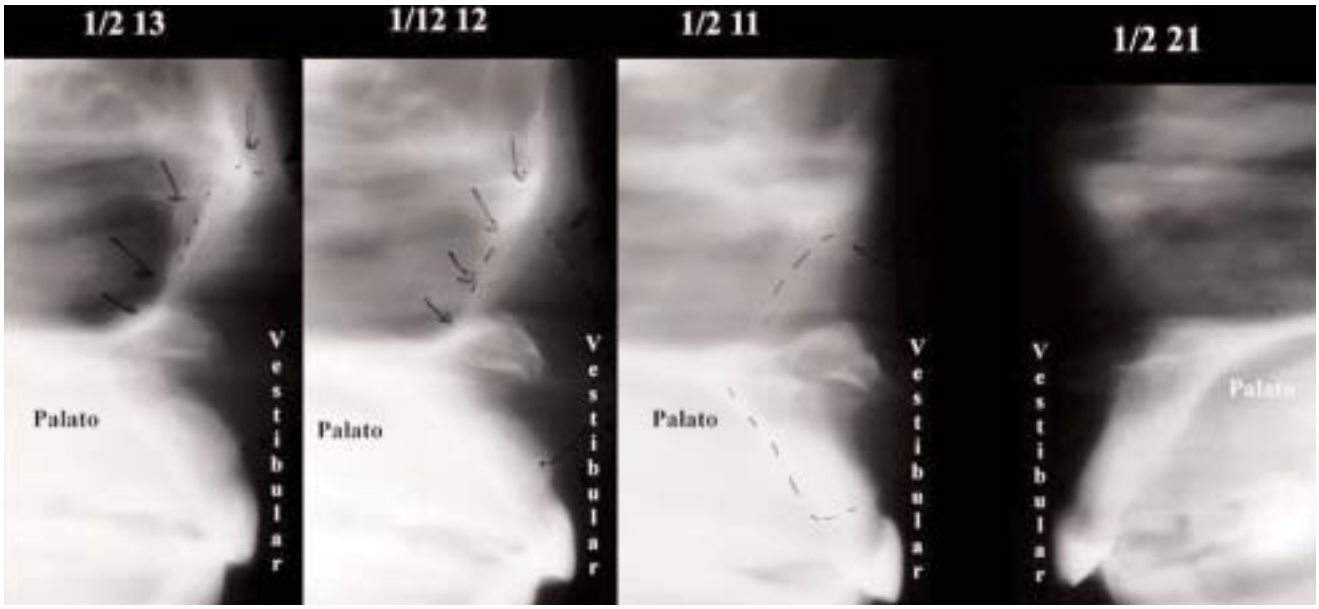


**Figure 2.** Linear tomography exams, cross sectional tomograms, were performed at the anterior region. It was possible to visualize the radiographic appearance of a displaced tooth under the nasal floor associated with the expansive osteolitic lesion.

refer to 6 to 7 year old children. Most cases are associated with impacted inferior third molars, and then with superior canines, upper third molar and impacted inferior premolars in that order.[13] The reported case involves an upper permanent incisor, which is an unusual site of occurrence.

The high growth potential of dentigerous cysts is apparently limited, but it can rise to great dimensions causing considerable bone destruction[14] or bone expansion sufficient to promote facial asymmetry.[13] The lesion growth on this reported case showed a high expansion, which might suggest a differential tumor diagnosis. However, by the time the permanent incisor was impacted, the lesion could have already started to slowly develop asymptomatically leading to facial asymmetry. This kind of cyst usually promotes bone expansion, but rarely causes cortical destruction.[11] Many dentigerous cysts reach great dimensions before being diagnosed.[1] Although not common in children, they apparently have great growth potential. Displacements of impacted teeth to another region, such as the mandible border, are relatively common. Movement of adjacent teeth or root resorption also occurs.[13] In the present case, the impacted tooth lay contiguous to the nasal floor. These cysts are usually asymptomatic, except in the presence of either infection or inflammation or when they reach large dimensions.[1]

The hypothetical diagnosis of the present lesion as an odontogenic cyst was possible based on data obtained during the clinical interview, as well as radiographic, linear and computerized tomographic images that allowed the individualization of the permanent impacted incisor and the bone lesion associated with it.

The selection of the proper surgical therapy depended on the dimension of the osteolytic lesion and its relation to adjacent anatomic structures that could be radiographically observed. The enucleation technique is the first surgical therapy choice for small cysts. When there is no continuity with important anatomical structures, this therapy provides the possibility of a histological study of the whole lesion.[11] It was possible to enucleate the entire lesion under general anesthesia despite the extensive bone destruction. Another surgical option would be marsupialization, usually recommended in cases of greater size, since it can promote decompression and lesion reduction. Considered a less invasive surgical procedure,[12] it may be the primary choice for children and when the impacted permanent tooth associated with the lesion is desired to erupt. In this particular case, would be unlikely in view of the age of the patient, the tooth location and the risk of relapse or pathology persistence.

The dentigerous cyst is not keratinized[1] and is seldom related to severe complications like ameloblastoma or epidermoid carcinoma transformation.[7]

This kind of cyst is usually detected in routine radiographic examination.[13] A dentigerous diagnosis requires an accurate radiographic image to be further confirmed by a histological exam. The radiographic images should identify the enhancement of the pericoronary space just around the crown of the impacted tooth[15] and will complement the histological exam of the odontogenic cyst.


**Figure 3.** Preoperative radiographs: Panoramic radiograph
Maxillary occlusal view
Intraoral view

An osteolytic lesion with a focal radiodense area was observed at the anterior region of the maxilla. It was possible to see the involvement with a reverse architecture and thinning of the nasal fossa at the right side.

The lesion is well visualized in the panoramic as compared to the occlusal and intraoral views

The dentigerous cyst presents typical radiographic features,[14] usually an unilocular radioluscence with clear borderlines generally related to an impacted tooth that can be displaced or not.[13] In order to clinically diagnose dentigerous cysts, the pericoronal space dimensions should be wider than 2.5 mm, which could be an evidence fluid gathering. However this fact is controversial among the authors.[11] Dentigerous cysts together with the radicular one represent one of the most common oral pathologies that exhibits radiolucent images.[11] The widening of the follicular space can also offer differential diagnosis other than that of dentigerous cyst, such as follicular hyperplasia, other odontogenic cysts or tumors.[11]

The panoramic radiography, although useful as a routine diagnostic method, has some limitations as proven by the present report. Computerized and linear tomographies were required to identify the retained


**Figure 4.** Postoperative Follow-up: Panoramic radiograph
Maxillary occlusal view
Intraoral view

At one-year-follow-up radiographs, we could appreciate the pattern of the ossification of the region and the absence of reverse architecture of the nasal fossa wall.

tooth. Images of conventional and panoramic radiography might be misleading, like in cases of superposition of bone structures. The CT and linear tomography provided a clearer view of the anatomical structures allowing us to plan a safe surgical procedure. The anatomic structure details and even the pathological condition are preserved on a CT image.[13,16,17]

Radiation on the CT method is higher than on conventional radiography. The literature does not recommend its use as a routine, however, radio-exposition should be taken into account taking into account the risks and benefits of an accurate diagnosis and surgical planning.[16]

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