

Dentigerous cyst associated with an impacted maxillary mesiodens

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ABSTRACT

A dentigerous cyst is a developmental odontogenic cyst, which apparently develops by accumulation of fluid between the reduced enamel epithelium and the tooth crown of an unerupted tooth. When observed with erupted and complete permanent dentition the diagnosis is 95% dentigerous cysts, and only 5% are associated with supernumerary teeth. Mesiodens is a supernumerary tooth situated between the maxillary central incisors. We report the case of a dentigerous cyst in association with an impacted mesiodens in an 18-year-old male patient. Radiographically, the cyst appeared as an ovoid, well-demarcated unilocular radiolucency with a sclerotic border. The present case report describes the successful management of a dentigerous cyst by surgical enucleation. Careful evaluation of the history and the clinical and radiographic findings, help clinicians to diagnose the condition accurately, identify the etiological factors, and administer the appropriate treatment.

Key words

Dentigerous cyst, enucleation, mesiodens, supernumerary tooth

INTRODUCTION

Dentigerous cysts are one of the most prevalent types of odontogenic cysts, mostly associated with an embedded or unerupted tooth. These cysts may involve impacted, unerupted permanent teeth, supernumerary teeth, odontomas, and rarely, deciduous teeth.^[1] The teeth that are commonly affected are, in order of frequency, the maxillary canines, the maxillary third molars, and rarely the central incisors. Dentigerous cysts around the supernumerary teeth account for 5% of all dentigerous cysts, most developing around a mesiodens in the anterior maxilla. 'Mesiodens' are the most common supernumerary teeth situated between the maxillary central incisors. More frequently the mesiodens occur unilaterally, but they may also be bilateral, while three or more supernumerary teeth, in the median region of the palate, are found more rarely. The usual age of the clinical presentation of the dentigerous cyst due to supernumerary tooth is in the first four decades.^[2]

Dentigerous cysts are often asymptomatic and are usually diagnosed during routine radiographic examination. The diagnosis relies on the radiographic and surgical observation of the attachment of the cyst to the cemento-enamel junction.^[3] They can enlarge, causing bone expansion, erosion, pathological fractures, or may become secondarily infected. The expansion of a dentigerous cyst is related to a secondary increase in the cyst fluid osmolality, as a result of the passage of inflammatory cells and desquamated epithelial cells into the cyst lumen. Swelling, teeth displacement, tooth mobility, and sensitivity may be present if the cyst reaches a size larger than 2 cm in diameter. A radiograph of the dentigerous cyst shows a well-defined unilocular radiolucency, often with a sclerotic border, surrounding the crown of an unerupted tooth.^[4] Surgical excision and pathological analysis of the lesion is essential for a definitive diagnosis. The present case report describes the management of a dentigerous cyst by surgical enucleation along with the involved tooth.

CASE REPORT

An 18-year-old male patient presented to the Outpatient Department of the Faculty of Dental Sciences, IMS, BHU, Varanasi, India, with a swelling in the maxillary anterior region, which was gradually increasing in size over the past two months. On general examination, the patient was apparently healthy. There was no significant past

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medical history. Clinical examination of the oral cavity revealed a painless, hard swelling, which had extended onto the maxillary alveolar process [Figure 1]. The routine laboratory tests were within normal limits.

A diagnostic orthopantomograph (OPG) revealed a radiolucent lesion in the alveolar process of the right anterior maxilla [Figure 2]. A supernumerary tooth was observed lying horizontally and inverted within the lesion, with a distinct crown, in relation to the roots of the right maxillary lateral incisor. There was no evidence of resorption of the roots of the associated permanent teeth. The lesion was well-defined, lying apical to the left central incisors, measuring approximately 4.5×4 cm. The buccal cortical plate showed slight expansion and the overlying mucosa was slightly inflamed. There was no sign of any acute periodontal condition or carious lesions.

After a clinical and radiological examination, a provisional diagnosis of dentigerous cyst was made, and also, large periapical cyst, odontogenic keratocyst, central giant-cell granuloma, adenomatoid odontogenic tumor, and ameloblastic fibroma were considered in the differential diagnoses.

Surgical enucleation of the cyst was chosen as the treatment of choice. The treatment consisted of an incision in the labial vestibule, removal of the cyst lining, and extraction of a mesiodens, along with total enucleation of the dentigerous cyst [Figures 3-5]. The surgery was done under local anesthesia (2% lignocaine with 1:80,000 epinephrine) and antibiotic cover. The cyst cavity was packed with sterile iodoform gauze, to achieve hemostasis and to prevent hematoma formation [Figure 6]. The iodoform gauze was removed on the following day and the sutures were removed after one week. The cyst was attached to the cemento-enamel junction of the extracted mesiodens [Figure 7]. The specimen was sent for histopathological examination. Histological examination showed a thin fibrous cystic wall lined by two to three layers of thick non-keratinized, stratified, squamous epithelium, with islands of odontogenic epithelium. The connective tissue showed a slight inflammatory cell infiltrate, which confirmed the diagnosis of a dentigerous cyst, associated with the mesiodens. The patient was on regular follow-up and no complications developed within the six-month follow-up.

DISCUSSION

The word dentigerous means ‘tooth bearing,’ which describes the cyst appropriately. A dentigerous cyst can be defined as a cyst that encloses the crown of an unerupted tooth, expands the follicle, and is attached to the cemento-enamel junction of the unerupted tooth.^[5] A dentigerous cyst develops only after the tooth crown is almost formed, and the precise sequence of events leading to its origin are uncertain. Studies have shown

that the incidence rate of dentigerous cysts involving the maxillary central incisor is 1.5%, as compared to 45.7% involving the mandibular third molar.^[6]

According to the pathogenesis, a dentigerous cyst can be of two types: The first is developmental in origin and occurs in mature teeth, usually as a result of impaction. The second type is inflammatory in origin, and occurs in immature teeth, as a result of inflammation from a non-vital deciduous tooth follicle.^[7] It has been suggested that a dentigerous cyst may develop by fluid accumulation either between the reduced enamel epithelium and the enamel, or alternatively, between individual layers of the reduced enamel epithelium. This fluid accumulation occurs as a result of the pressure exerted by an erupting tooth on an impacted follicle, which obstructs the venous outflow, and thereby, induces rapid transudation of the serum across the capillary wall.^[8] Toller has stated that the likely origin of the dentigerous cyst is the breakdown of proliferating cells of the follicle, after impeded eruption.^[9] These breakdown products result in increased osmotic tension, and hence, cyst formation.

In this case, the dentigerous cyst was due to a supernumerary tooth/mesiodens. The etiology of supernumerary teeth is unknown. Mesiodens may be single or multiple, erupted or impacted, and are rarely seen associated with a dentigerous cyst. The direction of the crown of the mesiodens may be normal, inverted, or horizontal. Mesiodens are known to have a cone-shaped crown and a short root as seen in our patient. Radiological examinations are indicated for the diagnosis of mesiodens. Their location, number, direction of the crown, influence on the adjacent teeth, resorption of the adjacent roots, and formation of a dentigerous cyst should be carefully evaluated. Most mesiodens are located palatal to the permanent incisors. Only a few lie in the dental arch or labial to the permanent incisors. Resorption of the adjacent roots by mesiodens or its cyst is a rare complication. In our patient, resorption of the roots was not observed.

Various treatment modalities are indicated for dentigerous cysts, it may be the surgical removal of the cyst, avoiding damage to the involved permanent tooth; enucleation of the cyst along with removal of the involved tooth; or use of a marsupialization technique, which removes the cyst, while preserving the developing tooth. The nature of the causative tooth influences the type of surgical treatment required for the dentigerous cyst. If the cyst is associated with a supernumerary or wisdom tooth, complete enucleation of the cyst along with extraction of tooth may be the first treatment of choice, as in our case. However, when preservation of the teeth is desirable and in a young patient, where the lesion is isolated, then marsupialization is the treatment of choice. On occasions, some untreated dentigerous cysts rarely develop into an odontogenic tumor (e.g., ameloblastoma) or a malignancy (e.g., oral squamous cell carcinoma). In such cases the



Figure 1: Preoperative maxillary view

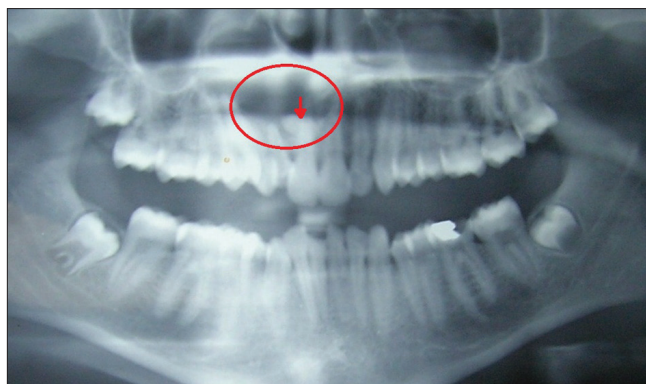


Figure 2: Orthopantomograph showing cyst with impacted mesiodens



Figure 3: Removal of the cyst lining

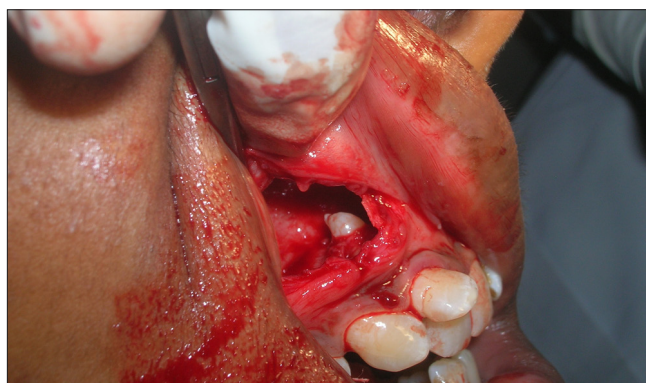


Figure 4: Impacted mesiodens

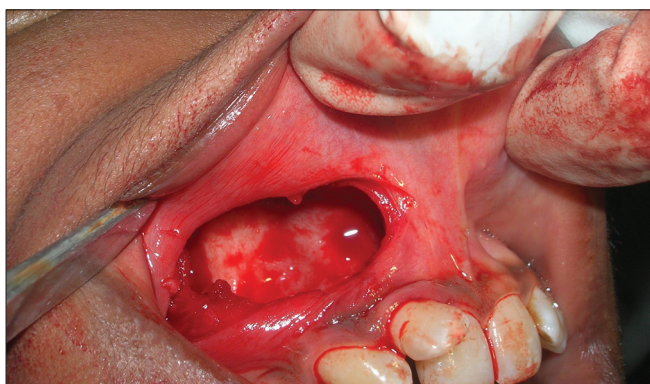


Figure 5: After extraction of mesiodens



Figure 6: Iodoform dressing



Figure 7: Extracted mesiodens

treatment of choice is surgical enucleation. Treatment of a dentigerous cyst depends on the size, location, and disfigurement, and often requires variable bone removal, to ensure total removal of the cyst, especially in cases of large ones. Complications associated with dentigerous cysts include pathological bone fracture, loss of the permanent tooth, bone deformation, and development of squamous cell carcinoma, mucoepidermoid carcinoma, and ameloblastoma.^[10]

CONCLUSION

Dentigerous cysts are usually associated with unerupted teeth. Therefore, it is important to perform a radiographic

examination of all the unerupted teeth. Removal of the associated tooth and enucleation of the soft tissue component is a definitive therapy in most of the cases. In this case, a mild displacement of maxillary anterior teeth, due to the cyst, was corrected with time, into the proper alignment of the arch. The result of this technique was elimination of the pathology and maintenance of proper dentition.

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