

## ORIGINAL RESEARCH

# Dentigerous Cyst containing a Supernumerary Tooth below Floor of Maxillary Sinus

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## ABSTRACT

Dentigerous cyst is considered to be a developmental odontogenic cyst that surrounds the crown of impacted, unerupted or supernumerary teeth. This case report presents a dentigerous cyst associated with a supplemental supernumerary tooth in right anterior maxillary region. Enucleation of the pathology along with the impacted supernumerary tooth was done. The patient has remained asymptomatic since 6 months and there is no evidence of recurrence.

**Keywords:** Dentigerous cyst, Supernumerary tooth, Enucleation, Computer tomography.

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## INTRODUCTION

Odontogenic cysts are the cysts of jaws that develop from epithelium of the tooth forming organs. Dentigerous or follicular cyst is the second most common type of odontogenic cyst after radicular cyst and the most common developmental cyst of jaw. The definition of dentigerous cyst according to the World Health Organization (WHO) is: 'A cyst which encloses the crown and is attached to the neck of an unerupted tooth'.<sup>1</sup> Dentigerous cysts are benign and generally solitary. Multiple cysts are occasionally reported in association with syndromes, such as Gardner's syndrome, Maroteaux-Lamy syndrome, mucopolysaccharidosis and basal cell nevus syndrome.<sup>2</sup>

## CASE REPORT

A 25-year-old male patient reported to the Department of Oral and Maxillofacial Surgery, Government College of Dentistry, Indore, with the complaint of progressively increasing swelling over canine and premolar area since 1 year (Fig. 1). He was prescribed antibiotics for the same by a general practitioner, but his complaints did not improve. There was no history of trauma. Intraoral examination revealed presence of solitary well-defined hard swelling of 3.8 × 3.5 cm with cortical plate expansion extending from mesial aspect of lateral incisor to the distal aspect of second premolar. Orthopantomograph showed a large well-defined radiolucency associated with 12, 13, 14, 15 and mesiobuccal



**Fig. 1:** Extraoral clinical appearance of the patient showing swelling laterally below nose on right side of face

root of 16 enclosing a horizontally impacted supernumerary tooth (Fig. 2). The resorption of roots was seen in relation to 12, 13, 14, 15. Routine hematological and biochemical investigations were within normal limits. Fine needle aspiration was done (Fig. 3). Smear prepared from centrifuged deposit of aspirated cyst fluid did not reveal any atypical cells or keratin like material. Histopathological examination revealed it to be a dentigerous cyst. After confirmation of diagnosis, cyst enucleation was planned. 11, 12, 13, 21, 22 were endodontically treated. The surgical procedure was done under conscious sedation. Mucoperiosteal flap was raised from left maxillary lateral incisor to right maxillary first molar (Fig. 4). Resorption of labial cortex was seen above



**Fig. 2:** Panoramic radiograph showing supernumerary tooth in the cystic cavity



**Fig. 3:** Aspirated cystic fluid



**Fig. 5:** The gross cystic soft tissue specimen along with the supernumerary tooth



**Fig. 4:** Intraoperative view showing the cystic cavity



**Fig. 6:** Postoperative view after 6 months

the roots of 13 and 14. This existing bone defect was further enlarged to expose the pathology. Entire pathology along with impacted tooth was enucleated (Fig. 5). The recovery of the patient was uneventful and he is symptom free 6 months later (Fig. 6).

## DISCUSSION

Dentigerous cysts are odontogenic lesions arising from the crown of impacted, embedded or unerupted teeth. They usually present in the second and third decades of life. There is a slight male predilection and the prevalence is higher for whites than for blacks.<sup>3</sup> They are most frequently associated with mandibular third molar, maxillary canine, mandibular premolar and maxillary third molar in decreasing order of frequency.<sup>4</sup> Typically dentigerous cysts are painless, progress slowly and may exist for several years without being noticed. They may acquire a large size and cause root resorption of the involved teeth before presenting any clinical symptoms<sup>5</sup> or may be detected accidentally in routine radiographic examination. Neglect for long periods

may cause an expansion sufficient enough to impinge surrounding vital structures like inferior neurovascular bundle or invasion into maxillary sinus. Such patients, when become symptomatic present with swelling, facial pain, headache<sup>6</sup> and nasolacrimal obstruction.<sup>7</sup> Rare manifestation may include orbital proptosis and epiphora. The exact pathogenesis of the origin is uncertain. However, it is believed that in the later stages of development the enamel organ gets reduced to few layers of epithelial cells that covers the crown of tooth prior to eruption. The accumulation of fluid in these layers of epithelium (intrafollicular theory) or between the epithelium and the crown of tooth, lead to the formation of dentigerous cyst. However, the cyst that does not originate in the enamel organ may also present as dentigerous cyst. The primordial cyst that grows to envelop the neighboring tooth may become dentigerous. An inflammatory etiology has also been proposed. Some cysts that develop around the crown of unerupted permanent tooth as a result of periapical inflammation from the overlying deciduous tooth and



lesions due to recurrent pericoronitis also present as dentigerous cyst. Another theory suggests that dentigerous cyst formation occurs in association with enamel hypoplasia due to degeneration of stellate reticulum at a very early stage of tooth development. Main's theory<sup>8</sup> suggests that impacted tooth exerts pressure on the follicle with resulting obstruction of venous outflow. This induces rapid transudation of fluid across the capillary walls. This causes an increase in the hydrostatic pressure exerted causing separation of crown from the follicle with or without reduced enamel epithelium. On radiographic examination, dentigerous cysts appear as unilocular radiolucent cysts of varying sizes, with well-defined sclerotic borders, associated with the crown of an unerupted tooth. A variant of the dentigerous cyst that originates at the bifurcation of molar teeth is paradental cyst or buccal bifurcation cyst. It appears as a well circumscribed radiolucency in buccal bifurcation region and buccal tipping of crown can be demonstrated in occlusal radiograph.<sup>9</sup> Waters view, panoramic radiographs and plain skull radiographs are simple and inexpensive methods that are used routinely to aid in diagnosis. Computed tomographic (CT) imaging displays bony detail, and gives exact information about the size, origin, content and relationships of the lesions involving the maxilla. The indications for CT examination of the mandible include the following cases: Dentigerous cysts with large size, dentigerous cysts including >1 tooth and supernumerary impacted teeth with dentigerous cyst, especially in the transitional dentition. CT enables a more accurate visualization of the relations between the cyst and the surrounding bone structures and helps to assess the precise osteolytic changes.<sup>10</sup> Magnetic resonance imaging (MRI) may fail to show the bony detail but precisely displays the lesional contents and provides information about the cyst fluid. On Histopathological examination in noninflamed cysts the lining epithelium appears 2 to 4 layers thick formed by 2 to 4 layers of flattened nonkeratinizing cells, the fibrous connective tissue wall is loose and contains substantial amount of glycosaminoglycan ground substance. When the dentigerous cyst is inflamed, it is characterized by the presence of hyperplastic rete ridges, collagenized fibrous wall and the cyst wall demonstrates inflammatory infiltrate. The differential diagnosis of a dentigerous cyst includes radicular cysts, odontogenic keratocysts and odontogenic tumors, such as ameloblastoma, Pindborg tumor, odontoma, odontogenic fibroma and cementomas. In case of maxillary sinus cyst with maxillary expansion mucocoeles, retention cysts and pseudocysts are also included in the differential diagnosis. The complications include pathological jaw fracture if the cyst is large enough, rare development into a

mural ameloblastoma or mucoepidermoid carcinoma and if the cyst is chronically infected there is a potential of development of squamous cell carcinoma. The treatment is usually enucleation and extraction of the associated impacted or unerupted tooth.<sup>11</sup> Marsupialization is considered in case of very large lesion where enucleation may damage vital structures, in children to allow eruption of unerupted tooth or in patients who are unfit medically. In large cysts an initial marsupialization to reduce the size of lesion followed by enucleation is done.<sup>12</sup> Recurrence is uncommon, but may occur if parts of the cyst lining are left *in situ*. In case of an associated supernumerary tooth the direction of the crown, its location and relation with neighboring teeth, resorption of adjacent tooth roots must be considered.

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