

EXTENSIVE ANTRAL INVOLVEMENT BY LARGE DENTIGEROUS CYST

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Abstract

A case of large dentigerous cyst associated with impacted third molar tooth involving the entire maxillary antrum is presented. It is interesting to observe that the lesion remained asymptomatic during its course with respect to its extent, causing destruction of a large part of the posterolateral wall of the antrum. Enucleation of the lesion with the associated impacted tooth through a Caldwell Luc approach was done under General Anaesthesia with good surgical outcome.

Key words : Dentigerous cyst, Maxillary antrum, Caldwell Luc

Introduction

A dentigerous cyst is one that encloses the crown of an unerupted tooth by expansion of its follicle, and is attached to its neck.¹ Dentigerous cyst occurred more commonly in men, white population, and age group between third and fourth decades; with prevalence of mandibular cyst twice more common than maxillary cyst^{2,3}. Dentigerous cyst occurs in association with an unerupted tooth, most commonly mandibular third molars. Other common associations are with maxillary third molars, maxillary canines, and mandibular second premolars. They may also occur around supernumerary teeth and in association with odontomas; however, they are only rarely associated with primary teeth.⁴ It is the second most common odontogenic cyst after the radicular cyst.⁵ These cysts may prevent normal tooth eruption, displace teeth when they become enlarged, destroy bone and encroach on vital structures (e.g., by encompassing or displacing the alveolar nerve or compressing the maxillary antrum). Nerve paresthesia is extremely rare for a dentigerous cyst. Paresthesia may be secondary to inflammation in the cyst wall or due to simple mechanical compression of the expanded cyst.⁶ Possibilities of development of squamous cell carcinoma, mucoepidermoid carcinoma and ameloblastoma have also been reported.⁷

Case Report

A 17year old female presented to Indraprastha Apollo hospitals, Sector 26, Noida, with a chief complaint of mild discomfort & occasional salty discharge from the upper right back tooth region. Patient was otherwise asymptomatic with no specific history of pain related to any of the teeth in the right upper jaw. Patient was on earlier occasions placed on antibiotics for similar mild episodes of discomfort by local doctors following which the symptoms generally resolved. There was no specific history of chronic rhinosinusitis. On examination intraorally, a full complement of teeth in the upper right quadrant except for a missing upper right third molar was observed. Expansion of the buccal cortical plate was palpable in the region of upper second molar tooth with 'egg shell crackling' perceptible along the posterolateral wall of the antrum. All teeth in the right quadrant were vital. An OPG radiograph showed a radiolucency with a radioopaque mass above the root apex of second molar tooth. Occipitomental view (fig 1) radiograph revealed a well defined radiolucency involving

the entire maxillary antrum with an impacted third molar displaced anteriorly, eroding the right buttress and posterolateral wall of the antrum extending to involve the zygomatic process of the maxilla. A CT scan (fig 2) confirmed the extensive antral involvement of fluid filled lesion displacing the impacted third molar anteriorly with destruction of the posterolateral walls. There was a strong clinical suspicion of a cystic lesion. FNAC revealed a yellowish tinged fluid. A preoperative diagnosis of a possible dentigerous cyst was made and an excisional biopsy under G.A was planned.

Patient underwent enucleation of the cystic lesion in toto, under general anaesthesia through a Caldwell Luc approach. The impacted third molar was immediately encountered after decorticating the anterolateral wall of the maxilla above the first molar region attached to the cystic lining (fig 3). The entire cyst was enucleated in toto with the tooth attached to the cystic lining (fig 4). After debridement the maxillary antrum was packed with roller gauze dipped in betadine solution and the pack was left protruding out from the vestibular incision site. The gauze was subsequently removed after 24hrs and the incision site was closed primarily under local anaesthesia. The enucleated specimen was sent for histopathological examination. The biopsy report confirmed the diagnosis of dentigerous cyst with an impacted upper third molar tooth. No untoward complications were observed postoperatively.

Discussion

Dentigerous cysts are benign odontogenic cysts associated with the crowns of permanent teeth.⁸ They are usually painless but may cause facial swelling and delayed tooth eruption. The usual presentation is in the second or third decade of life. Extensive maxillary involvement & childhood presentation are rare.⁹

Dentigerous cyst have greater tendency than other simple jaw cysts to produce some resorption of the roots of the adjacent teeth. This potential for root resorption may be derived from its origin from the dental follicle and the ability of the latter to resorb the roots of the deciduous predecessors, the crowns of which they surround.¹ The incidence of root resorption of the adjacent teeth has been reported to be as high as 50%.⁵ The tooth from which it erupts is generally clinically absent.

Radiographs of dentigerous cyst generally show unilocular radiolucent areas associated with crowns of unerupted tooth with well defined sclerotic margins unless they become infected.¹ A large dentigerous cyst may give the impression of a multilocular process because of the persistence of bony trabeculae within the radiolucency. However, dentigerous cysts are grossly and histopathologically unilocular processes and probably are never truly multilocular lesions.¹⁰

Three types of dentigerous cyst have been described radiographically, including the central variety, in which the radiolucency surrounds just the crown of the tooth, with the crown projecting into the cyst lumen. In the lateral variety, the cyst develops laterally along the tooth root and partially

surrounds the crown. The circumferential variant of the dentigerous cyst exists when the cyst surrounds the crown but also extends down along the root surface, as if the entire tooth were located within the cyst.¹⁰

There are two leading theories about the formation of dentigerous cysts. The first begins with fluid accumulation between the reduced enamel epithelium and the crown of the tooth. The other theory begins with a breakdown of the stellate reticulum, which forms a fluid between the inner and the outer enamel epithelium. In each theory, the fluid generates the cystic proliferation by its hyperosmolar content created by cellular breakdown and cell products, causing an osmotic gradient to pump fluid into the cystic lumen.⁵

The treatment is based on age of the patient, the site of presentation, the size of the lesion, the potential of the involved impacted tooth to erupt into occlusion and proximity of the lesion to the vital structures. Most dentigerous cysts are treated by enucleation with removal of the associated tooth, often without a preceding incisional biopsy. Large dentigerous cysts may be treated with marsupialisation when enucleation and curettage might otherwise result in neurosensory dysfunction or predispose the patient to pathologic fracture.¹⁰ Marsupialisation has the advantage of reducing the cyst cavity and preserving the involved tooth in the cyst. Orthodontic traction of the impacted tooth has generally been performed after marsupialization in patients with large cysts, a cyst-associated tooth with a mature root, or an ectopically erupted tooth.¹¹ Hyomoto et al. found that marsupialisation assisted natural eruption of the impacted tooth in the dentigerous cyst in 72.4% of their subject. Based on that, they concluded that marsupialisation promotes the natural eruption of a cyst-associated tooth and they suggest that in the paediatric population, marsupialisation should be considered as first line of treatment.¹²

In adults, the impacted teeth normally have a slim chance to erupt; therefore enucleation is a better treatment.³ Complete removal of the lesion and close monitoring of the patients are also critical as dentigerous cysts or the remnants may differentiate into ameloblastomas, squamous cell carcinomas, adenomatoid odontogenic tumors and complex odontomas.⁷ The possibility of the same must also be kept in mind. Enucleation of dentigerous cyst is curative with less recurrence rates. The low recurrence potential of a dentigerous cyst is probably related to the exhausted nature of reduced enamel epithelium, which has differentiated and formed tooth crown before becoming a cyst.⁵

Caldwell luc procedure is a standard approach for the management of antral disease as well as an operative route to reach sites such as pterygomaxillary space, orbit, ethmoid labyrinth, and the median skull base. It may be employed to remove mucocoeles, intra sinus tumours and large foreign bodies within the antrum, orbital decompression and ligation of the internal maxillary artery.³ It provides a very good exposure for enucleating large cysts within the antrum with minimal complications even though its role is decreasing with advances in technology. An opening at the inferior meatus is created surgically to promote sinus drainage. The inferior meatal antrostomy (IMA) theoretically allows passive drainage of reaccumulated material, though it is not always preferred to be performed after a Caldwell Luc approach. Al-Belasy reported IMA to close within 3 months after the operation in 82% of 367

cases.¹⁴

Caldwell Luc approach followed by primary closure is recommended in treatment of large maxillary sinus cysts.¹³ Complete surgical enucleation of the lesion with the associated impacted third molar was preferred in this case due to its large extent with destruction especially in the posterior maxillary region, uncertainty of the displaced impacted third molar to erupt in the desired occlusal position in the maxillary arch or with orthodontic tooth movement after marsupialisation.

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