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CASE REPORT

Infected Dentigerous Cyst Associated with a Horizontal Impacted Ectopic Supernumerary Tooth Induced by Trauma to the Maxillary Incisors: A Rare Case Report

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Dentigerous cyst is known to be caused by the accumulation of fluid between the epithelium and the crown of an unerupted tooth. Its size increases by the expansion of the follicle, and it is attached to the neck of the tooth. These cysts are often associated with impacted third molars and maxillary canines and rarely with supernumerary teeth. In the present paper, we report a case of a dentigerous cyst associated with an impacted ectopic supernumerary tooth. This cyst was missed initially due to a failed root canal treatment associated with the nonvital maxillary central incisor. This case of a cystic lesion can create a dilemma between radicular and dentigerous cyst. The pathogenesis of the ectopic tooth, differential diagnosis, and management are also discussed.

Key words: Dentigerous cyst, radicular cyst, ectopic tooth, supernumerary

INTRODUCTION

Dentigerous cysts are the second most common type of odontogenic cysts after radicular cysts and also the most common developmental cyst of the jaws.[1] The term dentigerous literally means "tooth bearing."[2] The term was coined by Paget in 1853 and arises from the crowns of impacted, embedded, or unerupted teeth.[3] Dentigerous cysts which are associated with supernumerary teeth constitute 5%–6% and about 90% of them are dentigerous cysts associated with maxillary mesiodens.[4]

Dentigerous cyst appears to result due to the accumulation of fluid between an unerupted tooth and the surrounding reduced enamel epithelium. They are twice as common in males as compared to females; with about 30% of them occurring in the maxilla.[5] Supernumerary teeth being most common in the maxilla have a strong predilection for the anterior region. Only 5% of dentigerous cysts are associated with supernumerary teeth. The most common clinical presentation of a dentigerous cyst with a supernumerary tooth is seen in the first four decades of life.[6]

The present paper reports a case of an infected dentigerous cyst associated with an ectopic supernumerary tooth which was missed at its initial presentation and was misdiagnosed with a radicular cyst.

CASE REPORT

A 47-year-old male patient reported to our dental clinic, with the chief complaint of painful swelling in the upper anterior region, which had been gradually increasing in size for the past 3 months. Detailed history revealed a traumatic injury to the anterior teeth 10 years back which was ignored, after temporary medication by a general physician. The pain resurfaced 6 months back for which the patient underwent a root canal treatment for the maxillary right and left central incisors. This was followed by an apicoectomy. However, no permanent relief was obtained, and the condition further deteriorated with pus discharge from the labial vestibule.

On clinical examination, a solitary diffuse extraoral swelling was seen causing a slight elevation of the upper lip. Intraoral examination revealed a swelling about 4 cm × 4 cm in the maxillary anterior labial vestibule which extended from the maxillary left canine to the maxillary right canine

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region [Figure 1]. The swelling was tender on palpation, fluctuant in consistency with the overlying mucosa appearing slightly bluish. The maxillary left and right central incisors showed grade II mobility and were tender on vertical percussion. Vitality test was performed on the incisors, canines, and premolars in the maxillary arch. The maxillary right and left central incisors did not give a positive vitality test.

Radiographic evaluation included orthopentamogram (OPG) and cone beam computed tomography (CBCT) scan. The panoramic radiographic showed a well-circumscribed, corticated radiolucent lesion in the anterior maxilla, crossing the midline, and extending from the right maxillary first premolar to the left maxillary first premolar. A radio-opaque object was seen at the floor of the nasal cavity suggestive of an impacted tooth [Figure 2].

The CBCT scan showed a massive, expansile lytic lesion involving the anterior maxilla bilaterally about 4 cm × 3 cm × 3 cm in size. There was significant expansion and thinning of the buccal and palatal cortical plates with dehiscence at the multiple sites. On the left side, the nasal floor was superiorly displaced and was thinned out. On the right side, there was the destruction of the nasal floor with the extension of the lesion toward the inferior turbinate. A horizontally impacted supernumerary tooth was observed along the palatal aspect just below the nasal floor on the left side. The crown of the tooth was oriented toward the basal bone of the maxilla. The root extended further palatally such that it was embedded in the hard palate [Figure 3].

Aspiration of fluid from the lesion was blood tinged, and the smear showed the presence of cholesterol crystals.

A provisional diagnosis of the periapical cyst, odontogenic keratocyst, dentigerous cyst, and unicystic ameloblastoma was arrived at.

The lesion was enucleated along with the supernumerary tooth and maxillary central incisors under general anesthesia. Full-thickness mucoperiosteal flap was elevated from left maxillary first premolar to the right maxillary second premolar. Overlying paper-thin bone was removed with rongeurs to expose the lining. In the area of central incisors, the lining was adherent to overlying mucosa which was dissected out. The cyst was attached to the cementoenamel junction of the maxillary supernumerary tooth along nasal floor [Figure 4]. The cyst was enucleated along with attached supernumerary tooth. Gel foam was placed in the cavity to aid hemostasis. The wound was sutured with 3-0 vicryl.

On histopathological examination, the gross specimen showed a cyst measuring approximately 4 cm × 2.5 cm in size, encircling the crown of the supernumerary tooth. The root apex of the maxillary central incisor was also attached to a portion of the cyst wall. The cyst was brownish-white. The luminal wall of the cyst showed the presence of granular projections [Figure 5].

The histopathological examination showed a cystic lumen with a thin stratified squamous epithelium, and a dense fibrocellular connective tissue wall with chronic inflammatory infiltrate. Features were suggestive of an infected dentigerous cyst [Figure 6].

DISCUSSION

Teeth which are located in the jawbones or regions other than the alveolar arch have been termed as ectopic. Ectopic eruption of a tooth is rare; however, few reports of a tooth in the nose,[7] mandibular condyle,[8] and coronoid process,[9] have been mentioned in the literature.

Ectopic eruption may occur due to any of the following three processes,[10]

Disturbance in tooth development where abnormal tissue interactions between the oral epithelium and the underlying

Figure 1: Intraoral photograph showing a swelling in the maxillary anterior labial vestibule

Figure 2: Orthopentamogram showing a well-circumscribed, corticated radiolucent lesion in the anterior maxilla, crossing the midline, and extending from the right maxillary first premolar to the left maxillary first premolar

Figure 3: Cone-beam computed tomography showing a horizontally impacted supernumerary tooth along the palatal aspect just below the nasal floor

Figure 5: Gross specimen showed a cyst encircling the crown of the supernumerary tooth with the root apex of the maxillary central incisor attached to a portion of the cyst wall

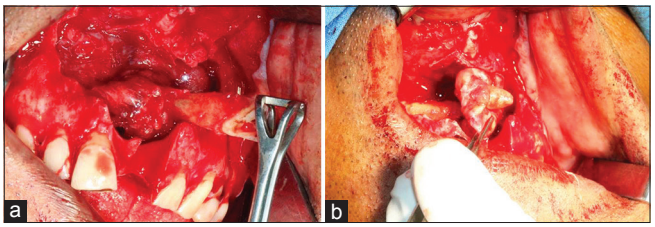

Figure 4: Surgical photograph showing (a) cyst attached to the periapical region of the maxillary central incisor and (b) the cyst attached to the cementoenamel junction of maxillary supernumerary tooth

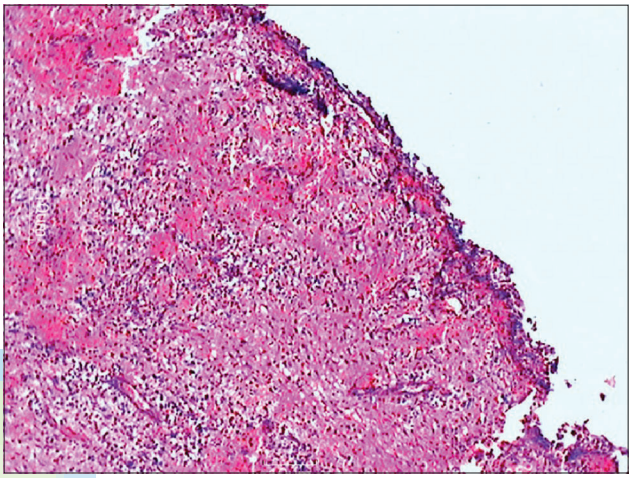

Figure 6: Photomicrograph showing a cystic lumen with a thin stratified squamous epithelium and a dense fibrocellular connective tissue wall with chronic inflammatory infiltrate (H and E, ×10)

mesenchyme occurring during development may result in ectopic tooth development. Iatrogenic activity where the displacement of the third molar into the maxillary antrum can occur during extraction. The pathological process where displacement of the tooth buds occurs by the expansion of the progressively growing dentigerous cyst may result in displacement of the tooth to other areas.

In the present case, the etiology was a dentigerous cyst, and the supernumerary tooth was attached to the nasal floor on the left side.

The association of a supernumerary tooth with a dentigerous cyst is rare condition, and this constitutes about 5%–6% of all dentigerous cysts.[4] Although dentigerous cysts have been reported in children, they are usually present in the second or third decades of life and are rare in childhood.[11] Males are more commonly affected (1.84:1).[5] Dentigerous cysts can be multiple and bilateral in patients such as basal cell nevus syndrome, mucopolysaccharidosis, and cleidocranial dysplasia or may be seen in nonsyndromic patients as well.[11]

Radiographic examination of a dentigerous cyst appears as unilocular radiolucencies of varying sizes, with sclerotic borders associated with the crown of an unerupted tooth. If the follicular space on radiography is more than 5 mm, an odontogenic cyst may be suspected.

An OPG is a simple, inexpensive radiographic method for viewing an ectopic tooth. However, a CBCT may have an edge over conventional radiography as it provides superior bony detail and helps to determine the size and extent of the lesion. In the present case, CBCT was helpful in locating the supernumerary tooth which was lying below the nasal floor and also in determining the extent of the cyst which was not appreciated on the OPG.

Histologically, dentigerous cysts are lined by a layer of a nonkeratinized stratified squamous epithelium, with a surrounding wall of thin connective tissue. In the present case, the lining was of variable thickness, and the connective tissue showed chronic inflammatory cell infiltrate. The cyst was

Figure 7: One-year postoperative orthopentamogram

large enough to approximate the roots of the maxillary central incisors. Hence, the apicoectomy attempted for the maxillary central incisors might have caused the infection to spread into the dentigerous cyst. The aspirated fluid also contained cholesterol crystals and red blood cells.

Cases of ameloblastoma, epidermoid carcinomas, and squamous cell carcinoma developing from the lining epithelium of a dentigerous cyst have been documented.[12,13]

The standard treatment for a dentigerous cyst is enucleation along with the extraction of the associated tooth. For large cysts, initial marsupialization to diminish the osseous defect, followed by enucleation and tooth extraction may be advocated. However, the recurrence or persistence of the lesion is a major disadvantage. In the present case, there was no evidence of any recurrence after 1 year [Figure 7]. Endoscopic approach for management of a dentigerous cyst has also been described in literature associated with less postoperative morbidity.[3]

CONCLUSION

Ectopic supernumerary teeth associated with a dentigerous cyst are a rare phenomenon. What may have been asymptomatic initially caused complications when the nonvital central incisors were improperly treated, and the apicoectomy which followed was unsuccessful. This caused the cyst to become infected. Advanced imaging techniques may be useful in treatment planning.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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