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Priyanka Ghogre, V Dal Singh

ABSTRACT

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Case Report: Herein, we report a case of dentigerous cyst associated with impacted inverted supernumerary tooth in anterior maxilla in a 28-year-old male. The patient was treated surgically by enucleation of total cyst and surgical extraction of mesiodens under local anesthesia and was subsequently confirmed histopathologically.

Conclusion: Recurrence of dentigerous cyst is rare and could be due to the residual fragments of the cystic lining. To prevent the development of a dentigerous cyst and to avoid unwanted effects on adjacent teeth, early detection consisting of a thorough clinical and radiographic examination is necessary for accurate diagnosis and proper treatment planning.

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CASE IN IMAGES

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Keywords: Dentigerous cyst, Reduced enamel epithelium, Supernumerary teeth, Mesiodens.

How to cite this article

Ghogre P, Singh VD. Management of an impacted inverted mesiodens associated with a large circumferential type of dentigerous cyst: A rare case report with one-year follow-up. International Journal of Case Reports and Images 2014;5(1):80–85.

doi:10.5348/ijcri-2014-01-445-CI-18

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]. This is the most common type of developmental odontogenic cyst, making up about 20% of all epithelium-lined cysts of the jaws. Most dentigerous cysts are considered to be developmental in origin, there are some appear to have an inflammatory pathogenesis. Dentigerous cysts can grow to a considerable size with a painless expansion of bone in involved area. Small dentigerous cysts are usually completely asymptomatic and are discovered on routine radiographic examination, whereas secondarily infected cysts are associated with pain and swelling [2].

Hyperdontia is a developmental alteration resulting in increased number of teeth and the additional teeth are termed supernumerary [2]. The prevalence of hyperdontia is reportedly between 0.15–3.9% [3]. About 80–90% of all supernumerary teeth occur in the maxilla, out of which almost half are found in anterior region. A mesiodens is a supernumerary tooth located in the maxillary central incisor region with the overall prevalence of 0.15–1.9% [4]. Mesiodens may occur as

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Received: 26 July 2013

Accepted: 31 August 2013

Published: 01 January 2014

single or multiple, unilaterally or bilaterally and may be erupted or impacted.

This case report describes the surgical management of an inverted impacted mesiodens associated with large circumferential type of dentigerous cyst.

CASE REPORT

A 28-year-old male reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain and swelling in left anterior maxillary region of buccal vestibule and palatal region of jaw since two months. On general examination, the patient was apparently healthy. There was no relevant past medical history.

On extraoral examination, there were no signs of swelling or deformity. On intraoral examination, the mucosa over the buccal vestibular swelling was intact (Figure 1A). Palatal swelling showed prominence of rugae with pain while mastication (Figure 1B). He also had features of midline diastema, High labial frenum attachment and slightly supra-erupted maxillary left central and lateral incisors compared to right side. On palpation the swelling was fluctuant, tender with no discharge. It was gradually increasing in size over the last two months. Electric pulp testing showed no response with 21, 22, 23, 24 and 25 with no tender on percussion.

A diagnostic orthopantomograph and maxillary occlusal radiograph were used as a preliminary investigation. Orthopantomograph showed a large unilocular radiolucent lesion extending from apical root portion of maxillary left central incisor to left second premolar region of jaw measuring approximately 4.5x2.5 cm (Figure 2). It involved a radio-opaque irregular structure associated with left maxillary central incisor.

Occlusal radiograph confirmed the presence of an impacted inverted supernumerary tooth with mamelons on its crown towards the lumen of the radiolucency (Figure 3). Almost two-third of the impacted tooth was enclosed within the radiolucency. Fine-needle aspiration biopsy showed brick-red colored fluid (Figure 4).

On the basis of clinical, radiographic examination and aspiration biopsy, the provisional diagnosis of an infected dentigerous cyst was made, associated with an impacted and inverted mesiodens. Surgical enucleation of the dentigerous cyst was planned along with the removal of impacted supernumerary tooth.

Treatment started with two visit-endodontic therapy in relation to 21 to 25, as all of them are nonvital and involved by the extent of cyst. Endodontic treatment was completed prior to surgical procedure. Surgical intervention was done in strict aseptic conditions under local anesthesia and antibiotic coverage. Buccal mucoperiosteal trapezoidal flap was raised from mesial gingival margin of 12 to mesial margin of 16. After reflecting the flap with periosteal elevator and protected with a retractor, the fluctuant cystic swelling was visible

Figure 1: Clinical preoperative pictures showing (a) labial and (b) palatal swelling.

Figure 2: Panoramic radiograph showing large well-circumscribed, unilocular radiolucent lesion with corticated margins, with radio-opaque irregular structure in relation to maxillary left central incisor.

Figure 3: Occlusal radiograph showing an inverted, impacted supernumerary tooth associated with unilocular radiolucent lesion.

because of bone resorption due to expansion of cyst. Surgical enucleation of cyst (Figure 5) along with removal of an impacted and inverted supernumerary tooth was done (Figures 6 and 7). Inspection of the cavity showed the maxillary roof was intact and not involving the maxillary sinus. Approximation of the flap was done and sutured with 3-0 silk non-resorbable suturing material which were removed after seven days of uneventful healing (Figure 8). Cystic lining sent for histopathological

investigation showed increased thickness of cystic lining due to inflammation, lined by non-keratinized stratified squamous epithelium and underlying fibrous connective tissue wall, also presence of cholesterol clefts in cystic wall (Figures 9 and 10) and thus confirmed the diagnosis of an infected dentigerous cyst.

Patient was followed for a year and presented no complications radiographically as well as clinically (Figures 11 and 12A–B). Sequential postoperative radiological follow-up using occlusal radiograph was done. The spontaneous regression of the lesion was seen.

Figure 4: Fine-needle aspiration biopsy showing brick-red colored fluid.

Figure 7: Supernumerary tooth with mamelons over the crown portion and serrations on the root portion showing gradual increase in size of cyst.

Figure 5: Cystic cavity after surgical enucleation of cyst with fresh bleeding.

Figure 8: Approximation of the flap with 3-0 silk suture material.

Figure 6: Excised cystic lining with supernumerary tooth.

Figure 9: Histological picture showing increased thickness of cystic lining due to inflammation, lined by non-keratinized stratified squamous epithelium and underlying fibrous connective tissue wall (H&E stain, x400).

Figure 10: Presence of cholesterol clefts in cystic wall (H&E stain, x100).

Figure 11: Occlusal radiographs showing (A) preoperative, (B) three months, (C) six months, (D) nine months, and (E) one year follow-up.

DISCUSSION

A cyst is an epithelial-lined pathological cavity containing fluid, semi-solid or gaseous contents and which is not created by the accumulation of pus [1]. The literal meaning of dentigerous is **tooth bearing**. Although dentigerous cysts are common lesions, their precise origin is uncertain. Histopathogenesis of dentigerous cyst suggests that it may develop by fluid accumulation either between the reduced enamel epithelium and the enamel of developing tooth, or alternatively between individual layers of the reduced enamel epithelium.

According to Main's theory, the pressure exerted by an erupting tooth on the surrounding connective tissue follicle has been suggested as obstructing the venous outflow to increase transudation of fluid across the

Figure 12: Clinical postoperative pictures of healed lesion on (A) Labial and (B) Palatal side after one year.

capillary wall, so that the increased hydrostatic pressure of this fluid separates the follicle from the crown with or without the epithelium. It has also been argued that over time, the capillary permeability is altered and protein-rich exudates accumulate within this newly formed space, which causes more fluid accumulation by osmosis and enlargement of the cyst [5].

Dentigerous cyst associated with an impacted supernumerary tooth was first described by A. T. Pitts in 1923 [6]. The peak incidence of dentigerous cysts commonly ranges from second to third decades of life but the age range for reported cases varies widely from 9–71 years with a slightly high predilection for males compared to females with ratio of 2:1 [7]. It has been shown radiographically that lesion 4–5 cm in diameter may develop in 3–4 years [1].

According to Gunduz et al. [8], 78.8% of mesiodentes were fully impacted, 7% were partially erupted and 14.1% were fully erupted. Most of the mesiodentes (55.2%) were found to be in vertical position (55.2%) followed by inverted position (37.6%) and horizontal position (7%). Stafne studied dentigerous cysts associated with supernumerary teeth and found an incidence of 5.5% among 200 supernumerary teeth [9]. Thus dentigerous cyst associated with supernumerary teeth is rare and estimated to constitute 5–6% of all dentigerous cysts.

According to Shear [1], a dentigerous cyst is one that encloses the crown of an unerupted tooth by expansion of its follicle, and is attached to its neck. In this case the cystic lining is not attached to the neck of tooth but involved the half of root portion along with crown. The diagnostic feature of this cyst is the presence of the unerupted tooth in its cavity results in failure of eruption of involved tooth.

The current case was an interesting rare example of a supernumerary tooth with mamelons over crown and completely formed root. Mamelons are the small protuberances separated by grooves best seen on the incisal edge of the newly emerged permanent incisor teeth. All anterior teeth show traces of four lobes— three labially and one lingually. Each labial lobe of the incisor terminates in a rounded eminence known as mamelons [10].

Radiographically, three types of dentigerous cysts

have been described as: central variety, lateral variety and circumferential variant, which exists when the cyst surrounds the crown and extends for some distance along the root surface, as if the significant portion of the root with crown is located within the cystic lumen [2]. The present case was radiographically a classic presentation of the circumferential variety of dentigerous cyst.

The treatment approaches were based on patient age, cyst site and size, involvement of vital structures by the cyst, and the potential for normal eruption into occlusion of the impacted tooth involved [1]. Once a mesiodens has been diagnosed, the clinician must decide on treatment to minimize further sequelae. Enucleation is the standard treatment for a dentigerous cyst along with extraction of the associated supernumerary tooth. Marsupialization is recommended for extremely large lesions, in cases when the involved tooth is desired to keep in the arch, or when a single draining may not be effective or when enucleation and curettage might otherwise result in neurosensory dysfunction or increased chances of pathological fracture [11]. 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 [12].

CONCLUSION

Recurrence of dentigerous cyst is rare and could be due to the residual fragments of the cystic lining. To prevent the development of a dentigerous cyst and to avoid unwanted effects on adjacent teeth, early detection consisting of a thorough clinical and radiographic examination is necessary for accurate diagnosis and proper treatment planning.

Author Contributions

Priyanka Ghogre – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

V Dal Singh – Conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Critical revision of the article, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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Article citation: Ghogre P, Singh VD. Management of an impacted inverted mesiodens associated with a large circumferential type of dentigerous cyst: A rare case report with one-year follow-up. International Journal of Case Reports and Images 2014;5(1):80–85.

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