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IP Indian Journal of Orthodontics and Dentofacial Research

Journal homepage: https://www.ijodr.com/

Case Report

Inflammatory dentigerous cyst management in paediatric patient followed by management of impacted maxillary canine with 1 year follow up: A rare case report

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ARTICLE INFO

Article history:
Received 28-09-2022
Accepted 16-11-2022
Available online 29-12-2022

Keywords:
Dentigerous cyst
Conservative therapy
Protruding teeth
Retained deciduous canine
Impacted permanent canine
Orthodontic management

ABSTRACT

Cysts of jaw present as swellings of jaws and midface. Of different varieties, dentigerous cyst is most common type of noninflammatory odontogenic cyst. Dentigerous cysts are generally associated with crowns of impacted or unerupted permanent teeth. Here we present a case of dentigerous cyst in 13-year-old female child, which was successfully treated with conservative therapy. Patient also reported after one and half year with protruding teeth and retained deciduous right upper canine & impacted permanent canine. This case report also presents orthodontic management of retained deciduous canine and impacted permanent canine.

1. Introduction

In general, cysts of jaw commonly present as swellings of jaws and midface. A sine qua non for development of dentigerous cyst is usually an unerupted tooth. Frequency of dentigerous cyst formation has been calculated as 1.44 in every 100 unerupted teeth.[1–3]

Dentigerous cyst is defined as cyst that originates by separation of follicle from around crown of unerupted tooth.[4] They are generally associated with crowns of impacted or unerupted permanent teeth, but they can be associated with an odontoma or developing tooth, and even deciduous teeth.[3,4] Dentigerous cysts are more common in male patients[5] and frequently occur during 2^{nd} and 3^{rd} decade of life.[6]

It is also been reported that progressing inflammation from root apex of deciduous tooth brings about development of dentigerous cyst around unerupted permanent tooth.[7] This finding suggests that teeth treated with RCT for pulpal and periapical infection may become involved in development of dentigerous cyst.[8]

Younger patients with unerupted or impacted teeth, have more predilections for dentigerous cysts.[9] Their early recognition and treatment is imperative to prevent further proliferation leading to osseous deformities and gross destruction. Dentigerous cyst may enlarge and extend posteriorly to involve ramus, or anteriorly into body of mandible to involve roots of adjacent teeth. It can also expand into antrum displacing involved teeth posteriorly or

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https://doi.org/10.18231/j.ijodr.2022.048

toward orbital floor.

Marsupialization is treatment of choice, for dentigerous cysts involving unerupted favourably positioned teeth to contemplate for smooth uneventful eruption of underlying teeth, however, for longstanding large lesions with teeth in unfavourable positions; enucleation of cyst along with removal of offending teeth remains gold standard.[10]

After mandibular 3^{rd} molars, maxillary canines are second most commonly impacted teeth,[11] with palatal impactions prevailing over buccal impactions.[12] Treatment approaches are aimed at canines' correct occlusion, as well as function and aesthetics of dentition and can be divided into preventive and surgical.

Most common treatment procedure in children and adolescents is surgical exposure followed by orthodontic appliance treatment, where, as a rule, primary canines are left in place until orthodontist has moved impacted tooth to this region.

Failure of eruption of mandibular canine is an unusual event. It has been suggested that eruption disturbances of mandibular canine are most often caused by local factors such as mechanical obstruction (supernumerary tooth/cyst/tumour), insufficient space in dental arch and tooth-arch size discrepancy. Systemic factors such as genetic disorders, endocrine deficiencies and previous irradiation of the jaws also have been suggested to play a major role.[13]

The purpose of this paper is to present a case of dentigerous cyst with unusual a paediatric patient and its conservative management. In this paper we have also illustrated orthodontic management of retained deciduous canine and impacted permanent canine.

2. Case Report

A 13-year-old girl reported to clinic, with chief complaint of swelling in the lower left posterior region of the face which was present since 1 month. Patient also complained of numbness of lower lip from left side. Otherwise, the child was physically healthy with no significant medical history.

Clinical history revealed that swelling started as small painless nodule which increased to present size over a period of 1 month. Past dental history suggested that pulp therapy had been performed on deciduous 2^{nd} molar.

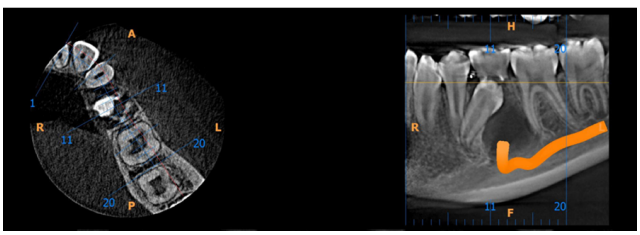

Fig. 1: Pre-operative CBCT

CBCT was adviced which revealed an unilocular well-defined radiolucency associated with an impacted deciduous 2^{nd} molar and retained permanent 2^{nd} premolar extending up to inferior alveolar nerve [Figure 1]. Histopathologic examination of aspirated biopsy showed cystic lesion, and presumptive diagnosis of dentigerous cyst was made.

Enucleation of cyst was considered as treatment of choice for minimize damage. Prior to surgery, routine blood and urine examinations were carried out and, results were within normal limits.

After obtaining an informed consent, surgical intervention was performed under local anaesthesia. Pathology involved retained deciduous 2^{nd} molar and retained permanent 2^{nd} premolar extending up to Inferior Alveolar Nerve. Treatment procedure involved removal of deciduous 2^{nd} molar and retained permanent 2^{nd} premolar. Flap was reflected along with thinned-out bone. The contents of cyst were evacuated, and cystic cavity was thoroughly irrigated to remove any residual fragments and debris. The cavity was then packed with iodoform-dressing.

Patient was periodically recalled for iodoform dressing for 2 months. The evacuated surgical specimens were histopathological examined to confirm diagnosis of dentigerous cyst. Patient was advised to maintain good oral hygiene and a chlorhexidine mouth rinse was prescribed. Radiographic follow-up revealed sufficient bone filling with increased bone density from margin to centre of the defect. [Figure 2]

Fig. 2: Follow up OPG

The patient reported to clinic after one and half year, with complain of protruding teeth. Extra oral examination, patient's profile was convex and lips were competent. Intra oral examination [Figure 3a,b,c] revealed:

1. The patient was in late mixed dentition stage. Dental age corresponded to 10–13 years of age.
2. Fair oral hygiene of patient.
3. Retained deciduous right upper canine & impacted permanent canine.
4. The patient had increased overjet and overbite.

Clinical evaluation, decision was taken by the patient and her family to undergo a closed flap procedure with bonding of an orthodontic button and attachment of an orthodontic

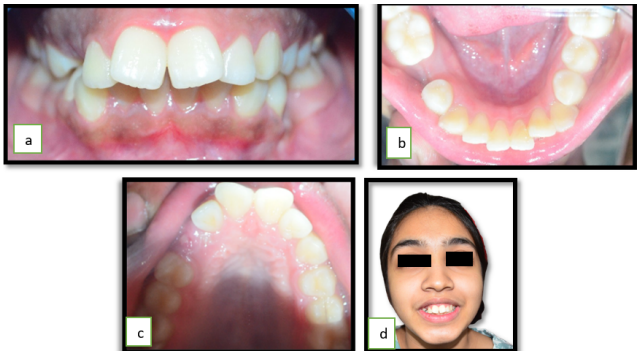

Fig. 3: a-d:

traction chain to the wire ligation to surgically expose the canine and mechanically guide it into its normal position in the dental arch and correct protrusion of teeth.

Main treatment objective was to guid eruption of impacted teeth to obtain functional occlusion with minimal impact on soft tissue profile. Extraction of upper 1^{st} premolar on both side and lower right 2^{nd} premolar was done to gain space and 0.022×0.028-inch Roth prescription. Preadjusted Edgewise appliance was bonded to available teeth. A soldered lingual arch wire was placed in upper arch to conserve anchorage. Light continuous wires were placed progressing from 0.016 NiTi, 0.018 NiTi, 16×22 NiTi and finally 17×25 SS wire. Then orthodontic forces were applied to attachment to move impacted tooth into occlusion. After sufficient eruption of impacted teeth occurred, NiTi overlay wires tied into brackets. Treatment was later focused on finishing with well-interdigitated posterior occlusion in both arches. [Figure 4 a,b,c,d,e,f,g,h,i]

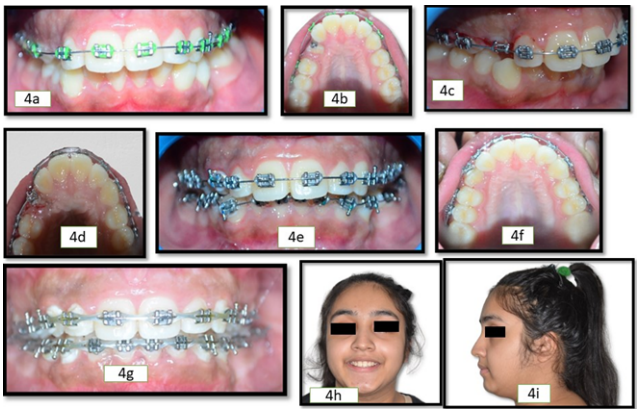

Fig. 4: a-i: Intra-oral photographs during treatment

The entire treatment was completed in 19 months. After debonding, upper and lower Hawley retainers were given. [Figure 5a,5b] Impacted teeth were properly aligned and the patient finished with a significantly improved functional and aesthetic result. Post-treatment results were very good, patient was happy with results.

Fig. 5: a,b

After 1 year follow-up was done, occlusion was stable and patient was satisfied and happy with treatment the results. (Figure 6)

Fig. 6: 1 year follow -up OPG

3. Discussion

Dentigerous cysts appear to have greater tendency to cause root resorption of adjacent teeth compared to radicular cysts or odontogenic keratocysts.[14] Cysts developing in growing child will enlarge much more rapidly than in adult, and lesions 40 to 50 mm in diameter can develop in a 3- to 4-year period, although patients may only give history of a slowly enlarging swelling.[15]

In an infected cyst, borders may be ill-defined. There may be difficulty distinguishing small cyst from normal tooth follicle. It has been suggested that any follicular space of >4 mm should prompt a strong suspicion for dentigerous cyst. However, differential diagnosis should include ameloblastoma, odontogenic keratocyst, and other odontogenic tumors, such as adenomatoid odontogenic tumor in anterior radiolucencies and ameloblastic fibroma in posterior jaws of young patients.[16]

Therapy for cyst is determined by its aetiology and localization, which, on one hand, means that causal tooth must be treated or removed and on other that cystic lining, which secretes cystic content, must be excised.[17] This statement fits well with treatment characteristics of dentigerous cyst.

Among various surgical treatment modalities to treat dentigerous cyst, enucleation of cyst is most widely accepted procedure. Marsupialization is another treatment modality, which is usually employed for large dentigerous cysts due to its significant size, possibility of destruction of

surrounding tissue and concern for potential of pathologic fracture.

A horizontally impacted tooth is considered tedious because of following reasons (1) unfavorability of eruption, (2) high anchorage requirements and (3) loss of vitality due to movement of teeth over further places. A horizontally impacted tooth in mandible is even more problematic compared to maxillary teeth because of high density of bone requiring greater force and greater time duration compared to maxillary bone.[18]

Impaction is retardation or halt in normal process of tooth. There are various terminology in literature to define impaction including delayed eruption, primary retention, submerged teeth, impacted teeth etc. A canine is considered as being impacted if it is interrupted after complete root development or contralateral tooth is erupted for at least 6 months with complete root formation.[19]

Impaction of maxillary canines is frequently encountered clinical problem. Causes of canine impaction is result of localized, systemic or genetic factor(s). There are number of possible sequelae to canine impactions. Diagnosis and localization of impacted canines is most important step in management of impacted canines based on clinical and radiographic examinations. Treatment usually requires an interdisciplinary approach. Other treatment options include no treatment, interceptive approach, extraction, auto transplantation and surgical exposure and orthodontic alignment of the impacted canine. Best treatment approach is early diagnosis and interception of potential impaction. In absence of prevention, surgical exposure and orthodontic alignment should be considered. Surgical treatment techniques and orthodontic considerations depend on the location of the impacted canine in the dental arch.[20]

We report case of dentigerous cyst in 13-year-old female patient, which was successfully treated with conservative therapy. This report also illustrates simplified surgical treatment for dentigerous cyst in mixed dentition period. We have also discussed orthodontic management of retained deciduous canine and impacted permanent canine in present case.

4. Conclusions

Dentigerous cyst is most commonly associated with impacted molars. In present case we reported rare case of inflammatory dentigerous cyst involving retained deciduous 2^{nd} molar extending up to Inferior Alveolar Nerve and its management. Impacted canines are very rare and are very difficult to manage. Asymptomatic teeth should be kept under observation and symptomatically impacted teeth require surgical extraction or surgical exposure and orthodontic management. Surgical and orthodontic management of impacted teeth is the most appropriate way to give functional and aesthetically acceptable occlusion.

5. Conflict of Interest

The authors declare that they have no conflict of interest.

6. Source of Funding

None.

References

1. Ko KS, Dover DG, Jordan RC. Bilateral dentigerous cysts-report of an unusual case and review of literature. *J Can Dent Assoc*. 1999;65(1):49–51.
2. Freitas DQ, Tempest LM, Sicoli E, Lopes-Neto FC. Bilateral dentigerous cysts: review of the literature and report of an u nusual case. *Dentomaxillofac Radiol*. 2006;35(6):464–8. doi:10.1259/dmfr/26194891.
3. Ustuner E, Fitoz S, Atasoy C, Erden I, Akyar S. Bilateral maxillary dentigerous cysts: a case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2003;95(5):632–5.
4. Neville BW. Oral and maxillofacial pathology. 2nd ed. Saunders, Philadelphia; 2005.
5. Benn A, Altini M. Dentigerous cysts of inflammatory origin: a clinicopathologic study. *Oral Surg Oral Radiol Endod*. 1996;81(2):203–9.
6. Arotiba JT, Lawoyin JO, Obiechina AE. Pattern of occurrence of odontogenic cysts in Nigerians. *East Afr Med J*. 1998;75(11):664–6.
7. Toller PA. The osmolality of fluids from cysts of the jaws. *Br Dent J*. 1970;129(6):275–8. doi:10.1038/sj.bdj.4802570.
8. Shibata Y, Asaumi J, Yanagi Y, Matsuzaki H, Konouchi H, Nagatsuka H, et al. Radiographic examination of dentigerous cysts in the transitional dentition. *Dentomaxillofac Radiol*. 2004;33(1):17–20. doi:10.1259/dmfr/24148363.
9. Kusukawa J, Irie K, Morimatsu M, Koyanagi S, Kameyama T. Dentigerous cyst associated with a deciduous tooth. *Oral Surg Oral Med Oral Pathol*. 1992;73(4):415–8. doi:10.1016/0030-4220(92)90317-j.
10. Farah CS, Savage NW. Pericoronal radiolucencies and the significance of early detection. *Aust Dent J*. 2002;47(3):262–5. doi:10.1111/j.1834-7819.2002.tb00340.x.
11. Moyers RE. Handbook of Orthodontics . Chicago, IL: Year book Medical Publisher; 1988.
12. Ericson S, Kurol J. Radiographic examination of ectopically erupting maxillary canines. *Am J Orthod Dentofacial Orthop*. 1987;91(6):483–92.
13. Counihan K, Al-Awadhi EA, Butler J. Guidelines for the assessment of the impacted maxillary canine. *Dent Update*. 2013;40(9):770–2. doi:10.12968/denu.2013.40.9.770.
14. Seward G. Treatment of cysts. In: Shear M, editor. Cysts of the oral regions . Oxford: Wright; 1992. p. 227–56.
15. Seward G. Radiology in general dental practice; 1964.
16. Daley TD, Wysocki GP. The small dentigerous cyst. A diagnostic dilemma. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 1995;79(1):77–81.
17. Sokler K, Sandev S, Grgurevic J. Surgical treatment of large mandibular cysts. *Acta Stomatol Croat*. 2001;35(2):253–7.
18. Lung KE, Ganatra S, Robinson CE. Multiple multilocular dentigerous cysts with intraosseous and extraosseous third molar displacement: a case report. *Oral Health*. 2006;6:20–9.
19. Lindauer SJ, Rubenstein LK, Hang WM, Andersen WC, Isaacson RJ. Canine Impaction Identified Early with Panoramic Radiographs. *J Am Dent Assoc*. 1992;123(3):91–2.
20. Aslan B, Üçüncü N. Emerging Trends in Oral Health Sciences and Dentistry. In: Virdi M, editor. Clinical Consideration and Management of Impacted Maxillary Canine Teeth. Intech Open; 2014. doi:0.5772/59324.

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Cite this article: Gupta G, Gupta DK, Gupta N, Gupta P, Gupta R, Sankhla D. Inflammatory dentigerous cyst management in paediatric patient followed by management of impacted maxillary canine with 1 year follow up: A rare case report. *IP Indian J Orthod Dentofacial Res* 2022;8(4):276-280.