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Paradental cyst mimicking a periodontal pocket – a conservative treatment approach (case report).

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Running title:

Paradental cyst mimicking a periodontal pocket

Paradental cyst mimicking a periodontal pocket – a conservative treatment approach (case report).

Abstract

A seven years old boy visited our clinic with a periodontal problem related to an erupting lower molar. The tooth showed a 15 mm deep periodontal pocket on the buccal aspect. A microbiologic DNA-test excluded a periodontal origin. The treatment consisted in a local antimicrobial therapy with cleaning and filling up of the pocket with Atridox^R. Two years after therapy the pocket completely disappeared.

Finding periodontal pockets on freshly erupted teeth with acute symptomatic, a cyst should be kept in mind as diagnosis. This could prevent surgical endodontal or periodontal therapy. Minimal therapy with local antibiotics can effectively manage this problem.

Introduction

The paradental cyst is a soft tissue lesion with unknown cause that is analogous to the dentigerous cyst found in bone. Paradental cysts were first reported in 1970⁸. The cysts noted few symptoms except lower cheek swelling and delayed eruption of the involved teeth in children. The published photoradiographs showed a characteristic inclination of the involved teeth towards buccal and the prominence of the lingual cusps. This cyst has to be separated from an eruption cyst, which is always seen in association with tooth eruption². The eruption cyst develops when the dental follicle separates from an erupting tooth and fluid or blood accumulates in the follicular space. The clinical appearance is a raised, bluish gingival mass on the alveolar ridge².

Case report

The following case describes an unusual paradental cyst in a 7-year-old boy who had a distinct palpable painful buccal cheek swelling in combination with a 15 mm deep periodontal pocket at the first lower right molar shortly after eruption of the tooth. In addition an unusual minimal invasive treatment regimen without surgical enucleation of the cyst is reported.

The 7-year-old boy was referred by a dental practitioner to the Dental Clinic 1 – Operative Dentistry and Periodontology, University of Erlangen-Nuremberg, Germany, due to a distinct palpable buccal cheek swelling and spontaneous tooth ache with the radiological diagnosis “periodontal pocket and apical radiolucency tooth 30” (Fig. 1). The mother reported that the ache in the right mandibular increased in the last four weeks so that her son could not sleep without analgesics. The ache had been continuously increasing, and caused in addition discomfort and difficulties in eating.

The clinical examination showed that the patient had a caries-free mixed dentition. Pulp sensibility testing with carbon dioxide snow resulted in a positive sensibility for all teeth. Periodontal probing was painful and a 15 mm deep bleeding pocket was found (Fig. 2 B). Due to the suspicion of a localized aggressive periodontitis a micro-IDent® periodontal DNA-hybridization test (Hain-Lifescience GmbH, Nehren, Germany) was taken out of the affected pocket for identification of possible periodontal pathogen microorganisms.

Therefore an endodontic treatment was not performed and a conservative treatment of the acute periodontal pocket was made to reduce the clinical signs of inflammation. The treatment was equivalent to the treatment of a periodontal abscess with the exception that the root surface was not scaled. Subsequent to rinsing with chlorhexidine 1% a local delivering metronidazol (Elyzol, Colgate-Palmolive GmbH, Hamburg, Germany) was applied into the pocket. The co-author gave the tip that this inflammation could be a harmless cyst during tooth eruption and advised us, not to make a surgical intervention, because controlling the inflammation with opening and draining the pocket should be enough for disappearing of the cyst by its own.

The DNA-test results showed no typical pathogenic microorganisms for the diagnosis “local aggressive periodontitis” (Fig. 2 A). Neither *Aggregatibacter actinomycetemcomitans* nor microorganisms of the red complex were detected. But remarkable amounts of *Fusobacterium nucleatum*, a typical bacteria in a periodontal abscess were found ⁴.

Two weeks later the patient visited the dental clinic again and the mother reported that the problems went better after therapy only for few days and the clinical symptoms worsened again soon later. Due to the reduced compliance of the young patient a local anaesthesia was made and then cleaned and then the pocket epithelium was scaled to extend the space for the local antibiotics. The aim of the treatment was to open, to drain and to disinfect the

pocket simultaneously with a minimal invasive surgical procedure. Then Atridox^R (Collagenex Pharmaceuticals Inc., Newton, Pennsylvania, USA) was applied, a ten percent doxycycline hyclate gel, which gets hard after contact with water, sulcus fluid or blood and remains stable for a long time in the pocket with a slow release of antibiotic agent over about 10 days ⁵. This procedure should disinfect the pocket and keep it open to avoid further inflammations.

This therapeutic intervention improved the clinical signs of inflammation within the next week. The inflammation did not reoccur and at the next appointment 6 months later we found a clearly reduced probing depth of 6 mm (Fig. 2 C). The tooth was carefully cleaned and the local antibiotic therapy was not repeated.

Two years later the pocket had completely disappeared. At the same site a maximum probing pocket depth of 3 mm was found without any signs of bleeding or pain (Fig. 2 D). The control orthopantomography (OPT) showed no differences between the lower right and lower left first molar. The apical translucency completely disappeared as well (Fig. 3).

Discussion

Although the available literature was intensively searched, no case of a paradental cyst mimicking a periodontal pocket as shown in our case could be found. Most authors showed cases of paradental or eruption cysts of third molars (paradental cysts) or of deciduous teeth ¹. Although some possible causative factors for cyst formation, such as infection or trauma of the primary teeth or a certain genetic predisposition, have been postulated, the exact pathogenesis of the paradental cyst formation is still unknown⁶.

In this case the main clinical symptoms were the distinct palpable cheek swelling, the deep periodontal pocket and the pain. The diagnosis “eruption cyst” was not the first choice and due to the radiological findings a serious periodontal problem was assumed. The result of

the DNA-test showed elevated quantities for a typical periodontal pathogen in an acute periodontal abscess. But usually periodontal abscesses develop on the basis of a chronic periodontitis ⁴. And from a healthy situation of a freshly erupted permanent molar there should not develop a localized periodontal pocket of 15 mm probing depth.

The alternative suspicion that the clinical signs showed an untreated localized aggressive periodontitis could not be confirmed by the results of the DNA-test. In addition the acute clinical symptoms in our case are very uncommon with the diagnosis of a localized aggressive periodontitis which often proceeds without any clinical symptomatic. Furthermore no additional bone loss could be observed at any other teeth.

The lesion in this case was localized in the buccal region of a freshly erupted lower first molar. A cyst in this location is described as a buccal inflammatory cyst ³ or as an inflammatory periodontal or paradental cyst ⁹. The origin of those cysts has not got cleared up to now whether it develops from the junctional epithelium or Malassez' cell rests or from the reduced enamel epithelium. That suggests that cyst formation develops as a result of unilateral expansion of the dental follicle and causes secondary inflammatory destruction of bone and periodontium ⁷. The aetiology and the histological features of the inflammatory collateral cyst, the paradental cyst and the mandibular infected buccal cyst are identical and the differences that exist in their clinical and radiological presentation can be related to the different teeth that are involved and the difference in the ages at which these teeth erupt. These cysts represent the same entity and their treatment is dependent on the teeth involved⁹.

A surgical procedure with enucleation of the cyst was not done due to the age of our patient and the reduced treatment cooperation. The aim of the therapy was a maximal conservative procedure with preservation of the periodontal ligament of the freshly erupted tooth. So deep scaling of the root surface was avoided in order not to damage the

periodontal tissue. The further development showed a slow reduction of the periodontal pocket (Fig 2 B, C, D). That was a sign of slow shrinkage or the periodontal eruption cyst towards coronal.

Conclusion

The case showed an unusual acute periodontal pocket at a freshly erupted lower first molar. A periodontal abscess as well as a localized aggressive periodontitis could be excluded. It was assumed than an infected paradental cyst simulated the periodontal pocket. The conservative treatment approach with minimal invasive pocket treatment using Atridox^R was successful in reestablishing healthy periodontal structures.

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Figure 1 A: The OPT made at the first visit shows the clinical situation. Due to the differences between the right and left lower molars, an apical endodontic involvement was suspected (arrow). The radiologic situation showed signs of an endo-perio-lesion.

 B: Dental X-ray of tooth 46 at the same time as Fig. 1. This picture showed that the tooth was not completely erupted. On the distal side the bone showed a cyst-like pericoronal lesion. An apical translucency was not visible.

Figure 2 A: Result of the DNA-test: no microorganisms of the AA-complex or the red complex could be detected. *Fusobacterium nucleatum* showed elevated levels.

B: The picture shows the vestibular view of tooth 46 at the first visit (picture taken with a mirror). On the buccal site we found a 15 mm deep bleeding pocket.

C: The clinical situation six month later. The eruption of the tooth did not seem to go on. The periodontal pocket was slightly reduced to 5 to 6 mm. Bleeding on probing persisted.

D: Two years later: there were no clinical signs of inflammation. The patient was free of pain and the swelling of the mandibular bone as well as the bleeding completely disappeared. The eruption of the tooth at that time was not complete.

Figure 3 OPT 24 months after the first visit. The “perio-endo-lesion” at tooth 46 completely disappeared. Permanent teeth erupted very slowly.