

Unusual Demonstration of Paradental Cyst Affecting Impacted Lower Third Molar

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Abstract

Case Report

The paradental cyst is an odontogenic cyst of inflammatory origin, localised on the buccal, distal, less common mesial aspects of partially erupted mandibular third molars, with the history of recurrent pericoronitis. This case report highlights paradental cyst that presented in the central of furcation area of a partially erupted mandibular third molar. Extra and intraoral examination, Dental Panoramic Tomograph (DPT) in addition to Cone Beam Computed Tomography (CBCT) have been done for the assessment and surgical planning accordingly. Tooth was removed surgically without any complications the tooth was removed in total with the cystic lesion attached between the two roots. The sample was sent for histopathological study which came out with the diagnosis of a paradental cyst. In conclusion this type of cysts is in unusual location, careful examination, radiographic assessment with histologic study is required in diagnosis of such lesion.

Keywords: Paradental cyst, impacted lower third molar, Dental Panoramic Tomograph (DPT), Cone Beam Computed Tomography (CBCT).

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INTRODUCTION

A paradental cyst (PC) is a type of odontogenic cyst affecting a vital impacted mandibular third molar usually diagnosed in the third decade of life, and commonly presented with a history of pericoronitis of the impacted tooth, radiographically appears as a unilocular radiolucency around the involved tooth and may simulate pathological appearance rather than the inflammatory origin of the cyst. This lesion commonly located in the buccal or distal to the affected tooth (Momesso *et al.*, 2020).

Inclusion of PC as a differential diagnosis is important because this cyst is commonly misinterpreted and misdiagnosed, especially when it presented with atypical clinical and radiographic presentations. Apart from just looking at the radiographic features, thorough patient history, clinical examinations and confirmation with histopathologic examination is needed in formulating an accurate diagnosis. (Chrcanovic *et al.*, 2011)

In this article, we reported a case of paradental cyst located at the uncommon area of the central of furcation area of a partially erupted mandibular third molar.

CASE REPORT

A 21-year-old Malay Male patient attended, the oral & maxillofacial clinic complaining of recurrent pain and food stuck in the lower left posterior area. Clinical examination revealed partially erupted 38, which was previously diagnosed as chronic pericoronitis. The plan to remove the impacted tooth was discussed with the patient and he agreed. Further examinations were done before the removal of the impacted tooth 38. The patient is fit and healthy except that he has had G6PD insufficiency since he was born. The intraoral findings showed partially erupted tooth 38, where only the mesiobuccal and mesiolingual cusp seen clinically, without the presence of any pathology in the surrounding areas.

Dental Panoramic Tomograph (DPT) and Cone Beam Computed Tomography (CBCT) imaging were done to evaluate the impacted tooth. On DPT, tooth 38 was vertically impacted, with slight distal inclination, with no sign of caries, and close relation between the root and the inferior alveolar nerve canal (IANC) as shown in Figure 1. Further CBCT evaluation with RadiAnt imaging software (Medixant. RadiAnt DICOM Viewer [Software]. Version 2021.2.2 January 19, 2022. URL: <https://www.radiantviewer.com>) revealed a unilocular radiolucency between the mesial and distal roots, size of 5.4mm x 2.5mm, (Figure 2) and extending to a small area periapically in the cross-sectional series (Figure 3). All the other adjacent structures were normal. Initial radiographic impressions of furcation or paradental cyst of 38 were given for this case.

The patient rinsed his mouth with chlorhexidine 0.12% then swabbing of the lips and perioral area was done, after that dripping including the head and the chest of the patient was performed. The operating site was anaesthetized with 2% mepivacaine epinephrine (1:100

000) one cartridge. A two-sided Ward flap using blade number 15, was performed, and a mucoperiosteal flap was raised, bone removal was done then the tooth was removed in total, the whole procedure was performed with no complications. Soft tissue lesion was found between the roots and sent for histopathological examination (Figure 4). Wound debridement was done and suturing of the field was performed using 3.0 black silk suture. The patient was prescribed with Acetaminophen Paracetamol tab.1g. and Mefenamic acid tab.500mg orally to be taken three times daily 3/7. A one-week post-operative review showed normal healing.

Microscopically the specimen with hematoxylin and eosin (H&E) stain showed a soft tissue lined by non-keratinized stratified squamous cell epithelium (Figure 5). The connective tissue wall was densely fibrous and infiltrated by chronic inflammatory cells. A definitive diagnosis of a paradental cyst was given by the Oral Pathologist in charge of the case.



Figure 1: DPT of the patient showing vertically impacted tooth 38, and the gross cystic lesion cannot be identified (red arrow). However, there was a small periapical radiolucency resembling perapical lesion or cystic lesion or the inferior alveolar canal



Figure 2: Multiplanar view of the lesion and the impacted 38 (red arrow)

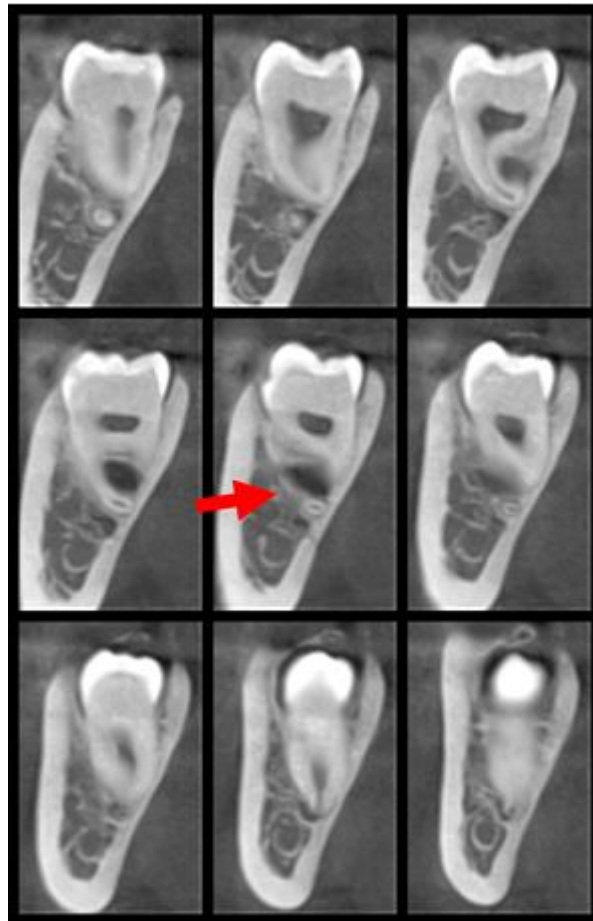


Figure 3: Cross sectional view of 1mm slice thickness and interval showing the location of the paradental cyst (red arrow) between the mesial and distal root, extending to a small part of the periapical area. There is close relation, but no communication between the root 38 and the inferior alveolar nerve canal

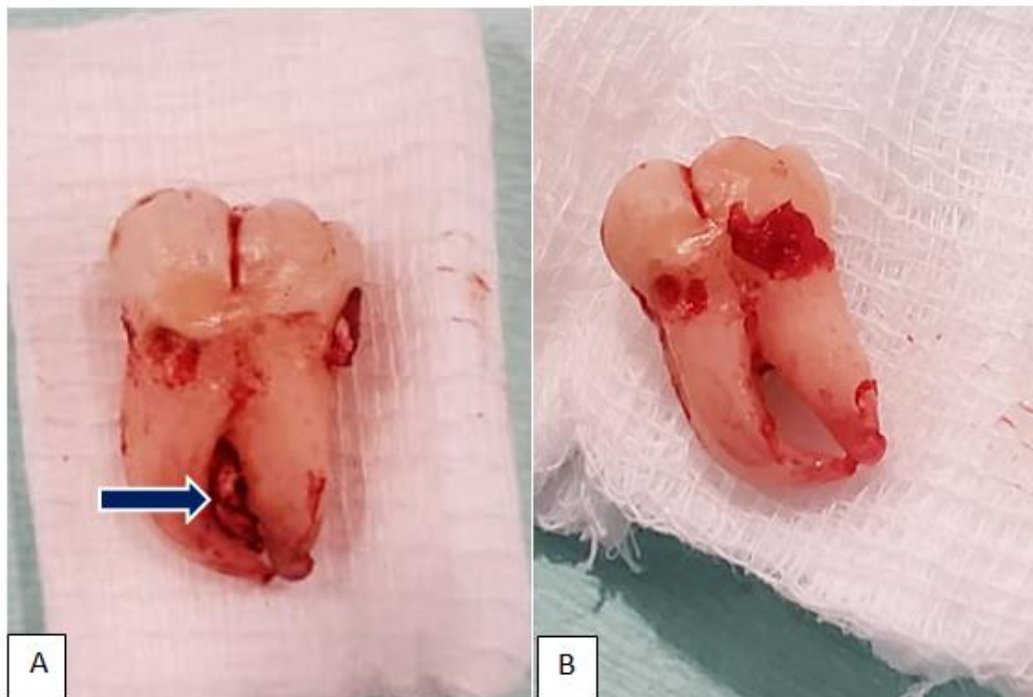


Figure 4: A: Clinical images of the removed third molar cyst lining (red arrow), B: cyst lining removed

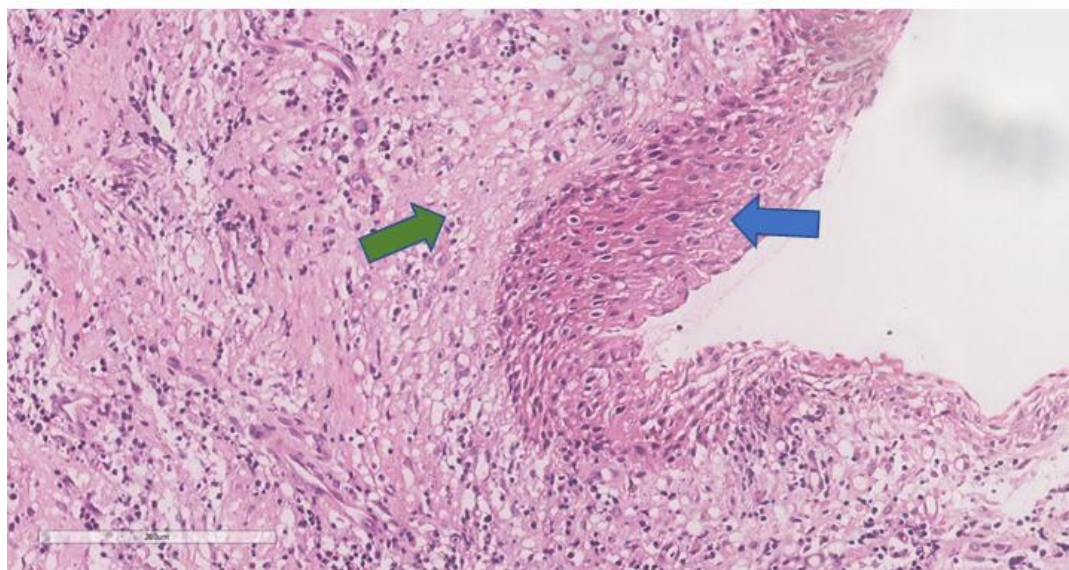


Figure 5: High-power photomicrograph taken from the biopsy of the lesion showing non-keratinized stratified squamous epithelial lining (blue arrow) with a fibrous connective tissue wall infiltrated by chronic inflammatory cells (green arrow) (Magnification x100, Stain H&E)

DISCUSSION

In general, PC has been underreported because it is not an easy task to gather enough clinical information to establish the diagnosis. PC has also been commonly misdiagnosed as dentigerous cysts that commonly associated with the crown of an unerupted tooth, pericoronitis which also associated with an impacted mandibular third molar, lateral radicular cysts, or inflamed dental follicles of an unerupted tooth (Mohan *et al.*, 2017; Momesso *et al.*, 2020). PC more commonly affect males, rather than females at 2:1 ratio, and it also commonly found in the age group of 20 to 40 years old (*WHO Classification of Head and Neck Tumours*, 2017), which is similar with our case, a 21-year-old male. With regards to the patient's gender, de Sousa & Deboni suggested that female to male ratio is higher (33:21), among 54 cases (de Sousa *et al.*, 2001), or without gender predilection (Maruyama *et al.*, 2015; Silva *et al.*, 2017).

The occurrence of PC among young adult age group is also described in the literature (Maruyama *et al.*, 2015; Silva *et al.*, 2017). The key clinical presentation of the paradental cyst is the history of pericoronitis on an impacted third molar tooth (de Sousa *et al.*, 2001) which is also similar to our case.

PC is classified as an odontogenic cyst of inflammatory origin in the 2022 WHO Classification of head and Neck Tumour (Speight, 2022). The common location for this lesion is in the mesial or distal of the impacted mandibular third molars, while most cases showed the location in the distal portion of the tooth. This case is a rare condition where the location of the PC in the central of furcation of the lower third molar, the common localization of PC according to the previous studies is distal and distobuccal (Ackermann G, 1987; de Sousa *et al.*, 2001; Mohan *et al.*, 2017; Ngeow *et al.*,

2000), apical (Özec *et al.*, 2008), buccal (Saincher *et al.*, 2018) and around partially erupted third molar (Kiattavorncharoen *et al.*, 2015). Most of the cysts were found located adjacent to a partially erupted or impacted mandibular third molar; only two cysts from their report were adjacent to the second molar, and one associated with the first molar. For gender predilection, their study found woman more commonly affected (de Sousa *et al.*, 2001). The main findings of PC are the presence of well-defined radiolucency on the radiograph, 10-15mm in size, and a history of pericoronitis in most cases (de Sousa *et al.*, 2001; Speight, 2022). This is the main difference between the literature and our case, there the radiolucency is located at the centre of the furcation of tooth 38 and extends to the periapical area. A history of pericoronitis is present in our case, while the size of the lesion is smaller than 10mm in our case, suggesting the early stage of the lesion.

Colgan *et al.*, stipulated that there are association between the location of the cyst and the angulation of the impacted tooth, according to the Winter's classification of horizontal, mesioangular, distal, horizontal and others. It was mentioned that for mesioangular impacted tooth, the cyst mostly found on the mesial side, for vertically impacted tooth, the cyst seen on the buccal side and distal or distobuccal to the other types of impaction angulation (Colgan *et al.*, 2002). However, in our case, the tooth was vertically impacted, and the cyst was not seen on the buccal side.

The pathogenesis of PC was theorized to be coming from the inflammatory reaction to the reduced enamel epithelium, the cell rest of Malassez and not forgetting the remnants of the dental lamina. The inflammation was also thought to cause the epithelial proliferation for the cyst (de Sousa *et al.*, 2001; Philipsen

et al., 2004). Histologically, the features between PC and inflammatory periapical radicular cyst are similar (Philipsen *et al.*, 2004). For that, it is very important to describe the clinical and radiographic characteristics when submitting the biopsy to the Oral Pathologist to get an accurate final diagnosis.

In this article, the imaging modality for this lesion was DPT and CBCT. On the pre-operative DPT, the lesion was not obvious but mostly showed a close relationship between the root of 38 and the IANC. Further investigation with CBCT was pivotal in showing the radiolucent lesion between the two roots and resembling a cystic characteristic. DPT is used as the main radiographic modality for diagnosing this lesion in the literature (de Sousa *et al.*, 2001), while CBCT is used to evaluate the lesion and surrounding anatomy in a multiplanar view (Ozcan *et al.*, 2016). Other studies use ultrasonography USG as a method of investigation to reach the diagnosis in case of perforation in the cortical bone which is limited to few cases (Derindağ *et al.*, 2019). Pinto *et al.* suggested an MRI scan in one study as an additional investigating method of diagnosis for the distinguishing type of cyst from other types of odontogenic lesions, to complement DPT and CBCT. MRI scan can typically shows cystic criteria with low-to-intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images, which is consistent with high protein concentration and a mixed inflammatory cell infiltrate in a cystic lesion (Pinto A. S., 2016).

Still, there is a controversy about the clinical presentation of the PC although it was mentioned in many previous studies that this type of cyst is associated with a partially erupted mandibular third molar. Momesso *et al.*, reported that PC could occur with a completely impacted tooth which is in contrast with the current study (Momesso *et al.*, 2020). Meanwhile, Kanno *et al.* mentioned that the presence of a PC should be considered when recurrent inflammatory processes are associated with partially erupted vital teeth, even when characteristic radiographic findings are absent (Kanno *et al.*, 2006).

The macroscopy of the lesion is described as a sac-like mass attached to the cemento-enamel junction (Speight, 2022), which is almost similar to our case. On microscopic examination of the lesion, the cystic tissue was lined by non-keratinized stratified squamous epithelium with infiltration of chronic inflammatory cells seen at the fibrous wall. Several odontogenic cysts could have a similar histopathological presentation; namely paradental cyst, radicular cyst, or inflamed dentigerous cyst. Thus, the pathologist relied on correlation with clinical and radiographic presentations to reach the final diagnosis of PC. As mentioned in the literature, in PC; the lining consists of squamous epithelial cells that are hyperplastic and non-keratinized with high-intensity of

chronic inflammatory cells (Speight, 2022). These similar findings were also described in our case.

For a correct final diagnosis, the combined interpretation of the patient history especially previous pericoronitis, clinical, radiographic, and microscopic histopathological findings to formulate the definitive diagnosis.

CONCLUSION

This article reported a rare case of PC with abnormal radiographic findings at the centre of root furcation of the mandibular third molar using DPT & CBCT, instead of the buccal side as reported in the previous literature. However, the history of recurrent pericoronitis can help clinicians in forming a provisional diagnosis of this case, which was later confirmed with a histopathology examination. This cyst has been under-reported due to the lack of sufficient clinical information to establish the diagnosis, and many may have been misdiagnosed as dentigerous cysts, pericoronitis, lateral radicular cysts, or inflamed dental follicles.

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