



## **Management of Radicular Cyst of Primary Molar: Case Report & Literature Review**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author ST designed the study, performed the statistical analysis, wrote the protocol and the first draft of the manuscript. Author SR managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.*

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**Case Report**

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### **ABSTRACT**

There are various inflammatory lesions seen in the oral cavity of children. Radicular cysts are odontogenic in origin and rare in the primary dentition, representing only 0.5 to 3.3% of the total number of radicular cysts in both the primary and permanent dentition. Treatment options for these cystic lesions include: endodontic therapy, extraction of the involved tooth, cyst enucleation or marsupialization. This case report describes surgical management of radicular cyst associated with an infected primary molar and a review of the literature.

*Keywords: Enucleation; marsupialization; non-vital tooth.*

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## 1. INTRODUCTION

There are various inflammatory lesions seen in the oral cavity of children [1]. Radicular cysts are odontogenic in origin and rare in the primary dentition, representing only 0.5 to 3.3% of the total number of radicular cysts in both the primary and permanent dentition [2]. These cysts are derived from the remnants of the epithelial root sheath (epithelial cell rests of Malassez) [3]. Most radicular cyst are asymptomatic and are discovered when radiographs are taken of the teeth with non-vital pulps. However, long standing, untreated cases can develop symptoms including: Swelling, tenderness, tooth mobility, and bluish tinge of the overlying mucosa caused by buccal expansion of the cortical plates [4,5]. Furthermore, displacement of the successor tooth or the loss of its vitality may also occur. [6]. On radiograph, the cyst appears as unilocular or multilocular with a radiopaque periphery of dense sclerotic bone. The treatment options for radicular cyst include: endodontic therapy with or without cyst removal, tooth extraction and cyst enucleation or for larger lesions, marsupialization followed by cyst enucleation. [7] This case report describes surgical management of radicular cyst associated with an infected primary molar.

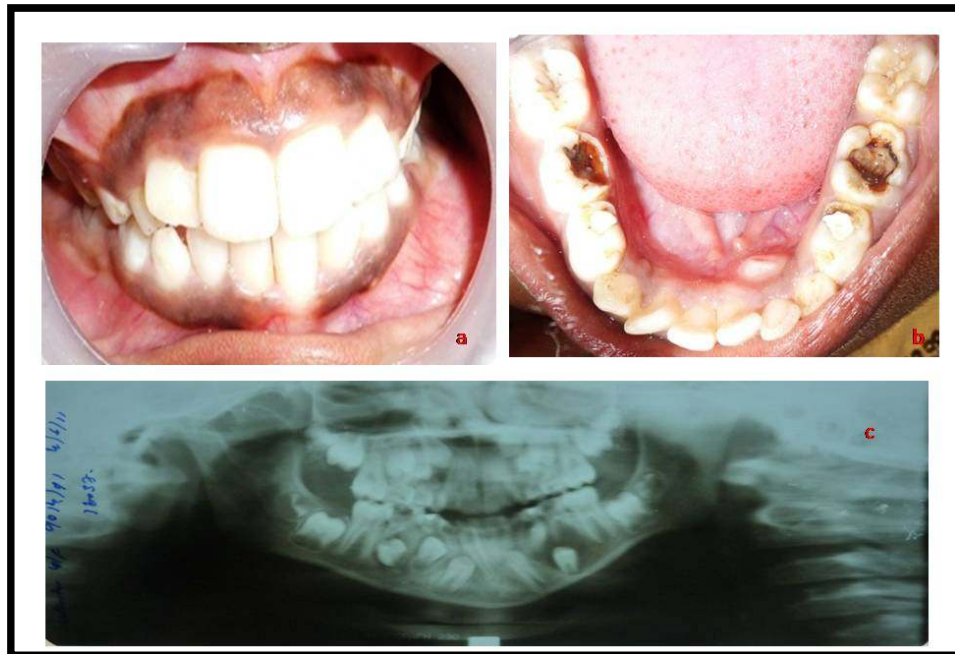
## 2. CASE REPORT

The patient was a ten-year-old girl who reported with a chief-complaint of swelling on the lower

left side of the face that had been present for three months duration. Initially, the patient had episodes of toothache in the same region, that was followed by swelling that gradually increased to its present size. Pain was of sudden spontaneous onset, moderate in intensity, dull, continuous, aggravated while chewing food, and relieved by taking medication. No pain radiation or referred pain was reported to be present. There was no history of any previous dental treatment. On extra-oral examination, marked facial asymmetry was observed. A diffuse solitary swelling was noted on the left side of the face measuring approx 3x5 cm antero-posteriorly extending from left corner of mouth to the angle of mandible and superio-inferiorly from zygomatic arch to the lower border of mandible. The swelling was diffuse, oval in shape, tender to palpation, and bony hard in consistency (Fig. 1). The skin over the swelling appeared reddish in color. On Intraoral examination there was swelling with buccal expansion of the cortical plate in the lower left quadrant and the mucosa over swelling was red and inflamed. The Federation Dentaire Internationale (FDI) tooth numbering system was used to record teeth present and the teeth involved. Clinical findings: 74 (FDI) - Grade II mobile 75 (FDI) - with deep dental caries, non tender on percussion with vestibular obliteration, 85 [FDI]-deep dental caries, tender on percussion with no vestibular obliteration (Fig. 2). Orthopantomogram revealed diffuse radiolucency in the periapical region of 75 encircling the crown of 35 [FDI] (Fig. 2).



Fig. 1. Pre-operative extraoral view, a-frontal view, b- lateral view



**Fig. 2. a and b intraoral view, c- OPG showing diffuse radiolucency in the periapical region of 75 encircling the crown of 35**

## 2.1 Procedure

A written informed consent was obtained before starting procedure. Routine pre-operative blood studies were performed. An aseptic environment was maintained throughout the procedure. A local anesthetic (2% lignocaine hydrochloride and 1:80,000 adrenaline) was administered to block the inferior alveolar, lingual, and buccal nerves. An incision around the necks of the involved teeth was made and carried anteriorly and posteriorly to include uninvolved teeth and bone so that the flap could be repositioned over sound bone. Releasing incisions were made into the buccal sulcus at both ends of the flap. A mucoperiosteal flap was then reflected using a periosteal elevator and the cyst exposed. The underlying cystic lining was grasped with a mosquito forceps and separation from the surrounding bone using a periosteal elevator. Curved curettes were used to complete the separation and removal of the cyst from the bone. The entire cyst was removed and tooth #'s 74 and 75 (FDI) were extracted. The cystic cavity defect was thoroughly irrigated and followed by placement of interrupted and figure of eight sutures (Fig. 3). The removed cystic lining was sent for histopathological examination. Tissue analysis confirmed the diagnosis of radicular cyst with infected dental follicle (Fig. 4).

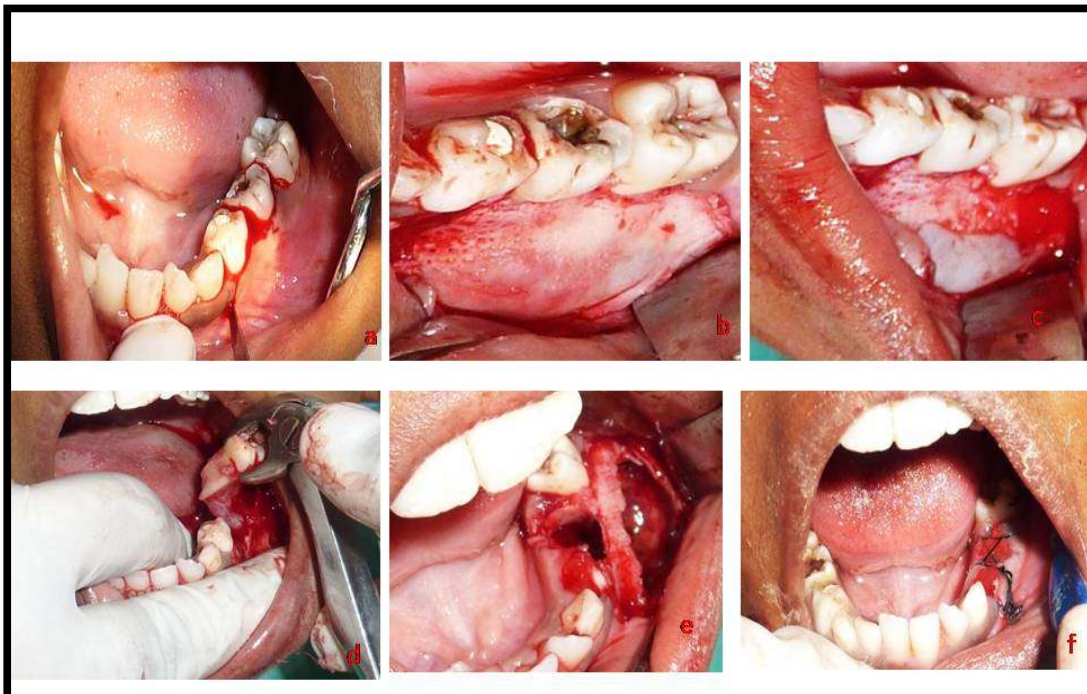
At one week follow up, the wound had healed uneventfully. A removable functional appliance was delivered to serve as a space maintainer as well as to help with mastication (Fig. 4).

## 3. DISCUSSION

Radicular cysts with primary teeth are rare in occurrence. Shear et al [8] reported that only 1% of cases develop in primary teeth. The reason for the low incidence of a radicular cyst in primary teeth compared with permanent teeth is thought to be due to shorter life span of primary teeth [9], easy drainage of inflammation due to accessory canals, and neglected radiolucent findings in the apical area of primary teeth. Additionally, lesions can resolve on their own after extraction or exfoliation of the tooth and, consequently, are not sent for tissue examination and diagnosis. Thus, this may account for the relatively small number of reported cases of cysts in primary teeth relative to cysts in permanent teeth [10]. Radicular cysts of primary teeth are reported to occur in an age range of 3–19 years with a male preponderance. In this case, the patient was a 10-year-old female which is considered to be a rare occurrence. Among the primary dentition, the most commonly involved teeth are the mandibular molars (67%) followed by maxillary molars (17%). Anterior teeth are least often

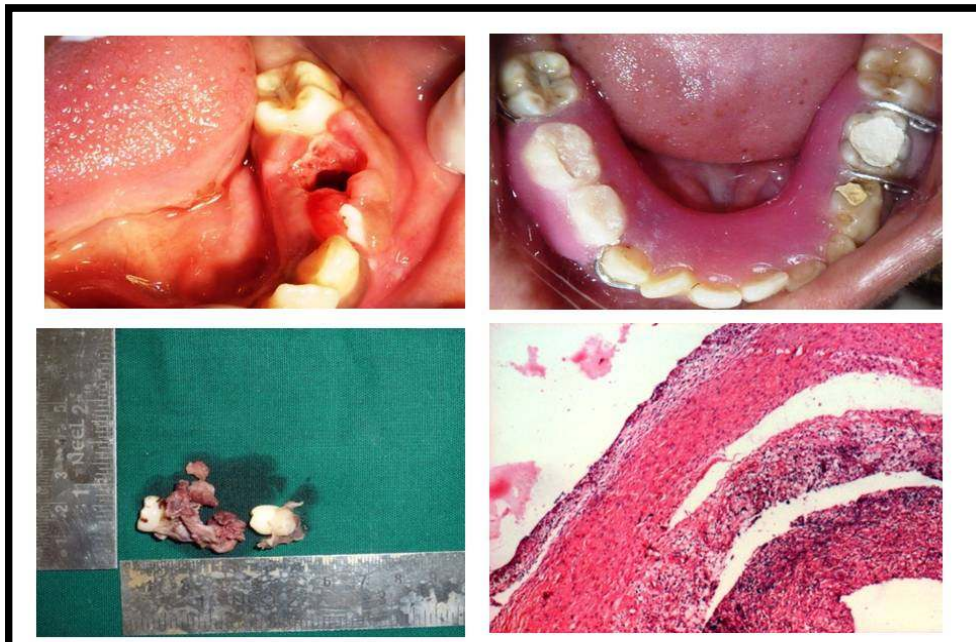
affected. A reason may be that the mandibular molars are frequent sites of dental caries [11]. Periapical granuloma and dentigerous cyst should be considered in the differential diagnosis of a radicular cyst. It should be remembered that periapical granuloma is the initial stage of radicular cyst formation making differentiation between two difficult [12]. The larger the granuloma, the greater the possibility of radicular cyst developing [13]. In differentiating radicular cyst from a dentigerous cyst, it is important to note whether the position of permanent tooth bud is retained or displaced, as a radicular cyst can encircle the crown of an erupting teeth bud. A definitive diagnosis requires a comprehensive assessment based on clinical findings, radiographic examination, surgical findings, biopsy and histo-pathologic examination. [9] As previously mentioned, treatment modalities for cystic lesions include: endodontic therapy, extraction of the involved tooth or teeth, marsupialization and enucleation, with primary wound closure. Marsupialization requires cyst decompression and obturator placement to maintain patency and prevent redevelopment of pressure within the cyst lining. Techniques for obturation include placement of a removable or fixed resin tube followed by saline irrigation after

each meal to prevent fibrous healing and to promote decompression or the use of a removable acrylic partial denture for decompression and space maintenance [11]. Treatment decisions are based on the size and localization of the lesion, the proximity of the cystic wall to vital structures, and bony integrity of the cystic wall. In the mixed dentition stage, if the cyst is small, enucleation is preferred. The cystic lining is separated and enucleated from its inner bony surface allowing blood to fill the defect and begin the healing process. For larger lesions or lesions in close proximity to vital structures marsupialization is preferred. The procedure of marsupialization consists of surgically de-roofing the outer wall of the cyst and establishing a permanent opening by suturing the remaining cystic wall to the mucosal surface followed by obturator placement as previously described [14]. Though marsupialization is conservative approach, its major drawback is that pathologic tissue is left in situ without thorough histologic examination and multiple visits are required for regular irrigation of the cavity and follow-up examinations [15]. In the present case report, cyst enucleation was planned based on cyst size and the need for a complete histopathological examination.



**Fig. 3. a-incision made, b-MUCOPERIOSTEAL FLAP being raised, c- cyst exposed, d- entire cyst removed with extraction of 75& 74, e- wound defect, f- cyst cavity packed, interrupted and figure of eight sutures were given**





**Fig. 4. (a and b) 1 week post operative follow up- a- healing wound defect, b- obturator delivered, c- gross specimen sent for HPE, d- histo-pathological report favorable of of radicular cyst with infected dental follicle**

#### 4. CONCLUSION

We reported an unusual case of a radicular cyst in a 10-year-old female pediatric patient. The case highlights the importance of planning surgery based on a thorough history, clinical and radiographic assessment, an accurate presumptive diagnosis, and an understanding of the available surgical options. In the case of a radicular cyst in a child, it is equally important to understand the possible sequelae of the lesion and plan appropriate intervention in a timely and effective manner.

#### CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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