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## Case Report

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# Radicular Cyst Associated with Primary Mandibular Second Molar - Surgical Intervention and Space Management: A Case Report

 <p><b>IJPPR</b> INTERNATIONAL JOURNAL OF PHARMACY &amp; PHARMACEUTICAL RESEARCH An official Publication of Human Journals</p> 
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## ABSTRACT

Odontogenic cyst are a group of jaw cysts that are, formed from tissues involved in odontogenesis (tooth development). Correct diagnosis and prompt treatment at the appropriate time will avoid future complications. Various treatment options like curettage, enucleation, radical treatment and marsupialization are available to manage the odontogenic cyst. This paper presents a case report of an 8-year-old male patient with radicular cyst associated with a primary mandibular second molar. Considering the age of the child, conservative attempt of marsupialization with glycerin laced iodoform gauze pack which saved the developing premolar and managing the space is discussed.



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## INTRODUCTION

Children exhibit many pathological lesions involving the jawbones. Odontogenic cysts constitute a vital aspect of oral and maxillofacial pathology because they are derived from the epithelium which is associated with the development of dental apparatus. Among lesions of inflammatory origin, radicular cysts are most common which are sequelae of dental caries<sup>1</sup>. Radicular cyst is an odontogenic cyst, derived from the inflammatory activation of epithelial root sheath residues of cell rests of Malassez within the periodontal ligament. The prevalence of Radicular cysts is only 0.5-3.3% of the cysts in primary dentition<sup>2</sup>.

Shear and Speight reported that development of a radicular cyst in primary teeth accounted for less than 1% of all cases<sup>2</sup>, whereas Lustman found that total 51 cases are reported, including their 23 cases from 1898 to 1983<sup>3</sup>. Nagata et al stated that 112 cases of radicular cysts with primary teeth have been reported in the dental literature from 1927 to 2004<sup>4</sup>. Although large radical cysts are treated by enucleation by removing bone and vital teeth, marsupialization may be chosen as a conservative approach to reduce morbidity<sup>2</sup>.

This paper reports the case of a radicular cyst associated with a carious primary mandibular second molar which when successfully managed with marsupialization and novel method of glycerin laced iodoform gauze pack placement helped in normal eruption of premolar.

## CASE REPORT

An 8-year-old male patient was referred from a private clinic to Department of Pediatric and Preventive dentistry for the management of pain and mild diffuse swelling in the lower right back tooth region for 3 weeks. Since childhood, the patient had multiple episodes of toothache which was managed by antibiotics and analgesics. There was a history of unsuccessful pulp therapy done on the same tooth when the child was 6 years old by general practitioner.

A reattempt to pulpal therapy was done on the same due to severe pain and swelling 3 weeks back from private clinic. There was a respite in pain but gradually increased 3 days back and was referred to our department.

Extraoral examination revealed a mild diffuse swelling in the lower right side of the mandible, without loss of facial asymmetry which on palpation was hard in consistency.

Intraoral examination revealed multiple carious teeth in the upper and lower arch indicating poor oral hygiene [Figure 1a,1b].

Local examination revealed carious teeth 84, 85 of approximately 2 x 3 cm in size with mild diffuse swelling extending from mesial of 46 to distal of 83. On palpation, the swelling obliterated the vestibule along with vestibular tenderness. Teeth were non-tender on vertical percussion. Thus, a provisional diagnosis of Radicular cyst was being made. Although conflicting differential diagnosis was noticed, final diagnosis was confirmed with CBCT.

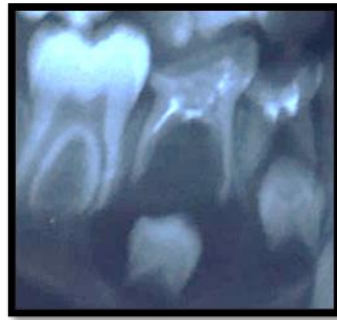


**Figure 1 a: Extraoral photograph showing mild diffuse swelling on lower right back tooth region**

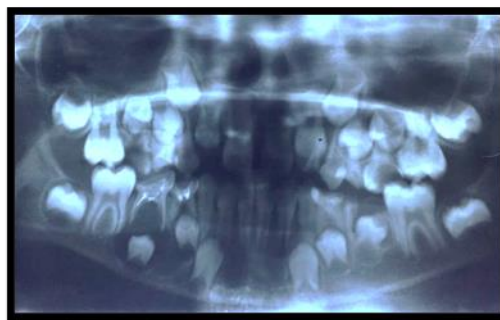


**Figure 1b: Intraoral occlusal view showing multiple grossly decayed tooth**

The various radiographic and 3D imaging inferences are depicted in figure 2a-g.



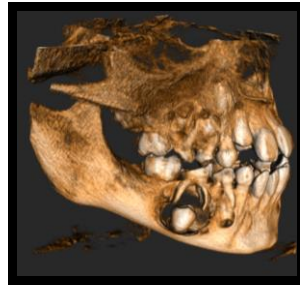
**Figure 2a: IOPA of lower right back tooth region showing a well-defined radiolucency surrounding teeth 84 and 85**



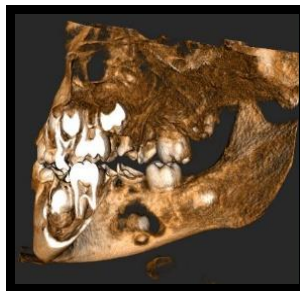
**Figure 2b: Panoramic view showing a radiolucent associated with a teeth 84, 85 involving tooth buds 44 and 45 (preoperative)**



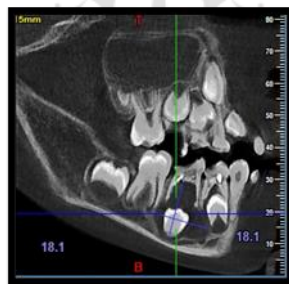
**Figure 2c: Mandibular occlusal view showing well defined multilocular radiolucency with buccal cortical pate expansion**



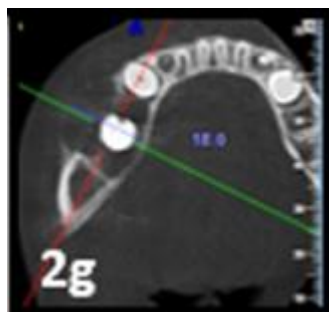
**Figure 2d: CBCT 3D buccal view showing involvement of tooth 44 and buccal cortical plate erosion**



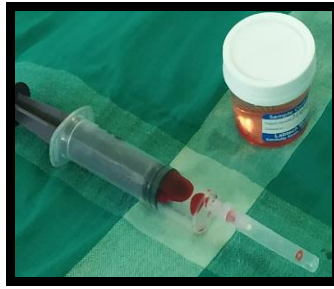
**Figure 2e: CBCT 3D lingual view showing lingual cortical plate erosion**



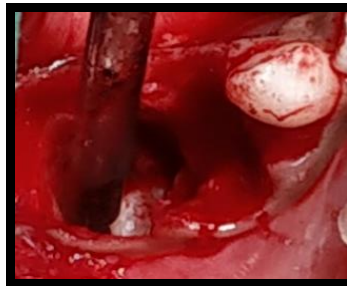
**Figure 2f: Antero- Posterior Extension and Height of Lesion: 18.1 mm**



**Figure 2g: Width of Lesion 18 mm**



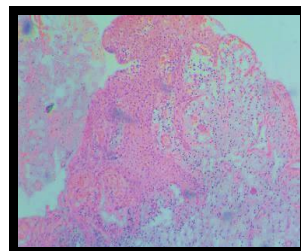
**Figure 3a: Aspirate and specimen collected for histopathological examination**



**Figure 3b: Procedure under General Anesthesia**



**Figure 3c: Placing glycerin laced iodoform pack inside the cystic cavity**



**Figure 3d: Histopathological features showing epithelium and connective tissue capsule with Arcading pattern of epithelium**

After obtaining written consent from parents, the procedures were performed under general anesthesia. FNAC was performed where the aspirate contained blood and inflammatory cells. Buccal flap was raised, tooth 85 extracted, contents evacuated. [Figure 3a-c] After copious

irrigation, the socket was packed with glycerin laced iodoform sterile gauze pack. Besides the procedure, other multiple grossly decayed teeth and root stumps 54, 55, 64, 65, 74, 75 was extracted. The aspirate and specimen were sent for histopathological examination.

A blood-mixed liquid which was collected on aspiration reported that it contained inflammatory cells. Histopathological features of the specimen revealed a cystic lumen lined by stratified squamous epithelium in an arcading pattern. [Figure 3d] The underlying connective tissue was fibro cellular with moderate chronic inflammatory cells and vascular channels confirmed the diagnosis of radicular cyst.

Postsurgical healing was satisfactory and uneventful. Patient was discharged the next day with medications and strict instructions to report to department every 4-5 days for repetitive glycerin laced iodoform sterile gauze pack change for a period of 45 days. For the space management, upper Nance holding appliance and lower lingual holding appliance were delivered [Figure 4b, 4c].



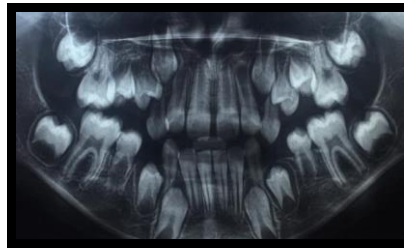
**Figure 4a: Panoramic view showing huge reduction in the radiolucent lesion with further occlusal movement of the tooth and continuation of root formation (2 months postoperative)**



**Figure 4b: Nance holding arch in place**



**Figure 4c: Lingual holding arch in place with erupted second premolar**



**Figure 4d: Panoramic view showing almost complete ossification of the bony defect and further occlusal movement of the tooth as well as continuation of root formation (6 months postoperative)**

The post-surgical evaluation is given in figure 4a and 4d.

## DISCUSSION

Radicular cyst comprises about 52% of all the jaw cysts. Even though it is one of the common cysts of jaws, its incidence in the primary teeth are considered to be rare. It is reported to occur in mixed dentition period with an incidence of 0.5-3.3% and a male predilection of 1.6:1<sup>2</sup>. The explanation for the low incidence is thought to be the shorter life span of primary teeth in the jaw and easy drainage due to presence of numerous accessory canals. In addition, after extraction or exfoliation of the associated tooth, the lesions usually resolve on their own and are not usually submitted for histopathological examination<sup>5</sup>.

However, a survey by Mass E *et al* had reported that the prevalence is probably higher than that reported where 73.5% were diagnosed as radicular cysts<sup>6</sup>.

The most favoured site is the mandibular molars as they are frequently affected by caries. Cortical bone in this region is thick; therefore, lesions may not drain readily through sinus tract<sup>6</sup>.



In case of primary teeth, unsuccessful pulp therapy is considered as the major etiological factor for the development of radicular cysts. Several authors have reported radicular cyst associated with primary teeth after pulp therapy <sup>7-9</sup>. A literature review showed that there were 112 total cases reported from 1927 to 2004, and reports that 56% of them to be in response to pulp therapy <sup>4</sup>. Some of these cysts showed rapid growth, large size, and cortical plate expansion <sup>7-9</sup>. According to case series published by Grundy GE *et al.*, they concluded that rapidly expansile cyst may develop in association with unsuccessful pulp therapy with Formocresol, KRI paste, or caustic. <sup>9</sup> It is hypothesized that pulp therapeutic agents, such as Formocresol with tissue protein, may contribute to the antigenic stimulation of periradicular tissue, leading to rapid growth and cortical plate expansion.<sup>9</sup> This is in accordance with our patient who had undergone an unsuccessful pulpal therapy and was presented with large radiolucent lesion.

Highest incidence of radicular cyst arising from primary teeth are mostly seen in 7–8 year old and the growth rate is reported to be 4mm annually.<sup>4</sup> Considering the patients age and lesion size, we suspect active growth of the cyst in this case.

Radicular cyst associated with primary molar and dentigerous cyst arising from permanent successor is most often confused. Differential diagnosis is critical to avoid extraction of permanent successor. Complete evaluation of clinical, radiographic and histopathology investigation and surgical findings can benefit in this process. The clinical and radiographic hints that help in differentiation between the two have been enumerated by Wood RE *et al.* <sup>10</sup> The following features can help in confirming the diagnosis of radicular cyst.

1. Evidence of carious/traumatized/ endodontically treated tooth
2. Loss of lamina dura around the roots of the suspected tooth
3. Follicular space around the permanent successor is intact and clearly visible.

Regarding young age of child, Marsupialization of the cystic lesion is an effective treatment option despite enucleation. Marsupialization is preferred because of a lower morbidity, preservation of permanent tooth buds and bone growth occur as the lesion decreases in size, resulting in a more normal bone contour. In children, healing of the post-surgical osseous defects is always good as they have high propensity for bone regeneration. In our case, complete healing was observed with the protection of vital structures using a minimally

invasive approach. Despite the limitations of marsupialization technique, it has got advantages of preserving the bone and vital teeth. However, both Patient and parent cooperation are needed for success.<sup>11</sup>

Study by Agarwal and coworkers<sup>12</sup> had reported Long term follow up and use of Bismuth Iodoform Paraffin Paste saved the patient of supra major surgeries and those of Vijaykumar and Sinha<sup>13</sup> reported that iodoform pack reduces wound fluid by fibrinolytic activity, exhibits antimicrobial activity after topical application and covers denuded bone surface to reduce pain. Numerous authors Chabra N et al<sup>14</sup>, Bhardwaj et al<sup>15</sup> and Kirtaniya et al<sup>16</sup> have also reported placement of iodoform pack in the cystic cavity and have proven satisfactory results.

Therefore, marsupialization followed by iodoform gauze pack is an effective treatment option in the management of radicular cyst where eruption potential of young permanent teeth is still remaining thus avoiding radical excision procedures.

## **CONCLUSION**

Clinician should always consider the possibility of radicular cyst originating from carious primary teeth. Radiographic follow-up is crucial for endodontically treated primary teeth at regular intervals for early detection of radicular cyst. Early diagnosis is important to avert adverse effect to the underlying permanent teeth.

Marsupialization with iodoform gauze pack is an effective treatment option in the management of radicular cyst as it facilitates eruption of permanent teeth and arch integrity was preserved with holding arch.

## **CLINICAL SIGNIFICANCE**

1. Early detection, diagnosis, management and post endodontic evaluation is necessary in pediatric population.
2. Prior to the management of cyst, 3D imaging is a very relevant tool for diagnosis and surgical planning.
3. Possibilities of conservative surgical management should be looked into in mixed dentition phase.
4. Arch integrity managed with holding arch.

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