



# Endodontic Management of Facial Cellulitis in relation to primary molars

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## Abstract

An odontogenic infection is a polymicrobial, mixed infection (aerobic and anaerobic bacteria). It is the most common type of oral infection and its treatment involves up to 10% of all antibiotic prescriptions. Facial cellulitis is a diffuse inflammation of soft tissue that is not confined or limited to a specific region and tends to spread. It is mainly caused by *Staphylococcus aureus* and *Streptococcus pyogenes* (especially Group A beta-haemolytic *S. pyogenes*). Patients present with local symptoms such as erythema, swelling, tenderness and warmth and may also have systemic symptoms. Here we report the resolution of cellulitis in a 4-year-old child by performing endodontic treatment alongwith antibiotic therapy. Early diagnosis and prompt treatment is mandatory to avoid life-threatening complications.

**Keywords :** cellulitis, endodontic treatment, primary maxillary molar, pulpectomy, odontogenic infection

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## Introduction

The primary teeth are used to maintain good nutrition by allowing them to chew properly and thus helping in child's digestion and assimilation, during one of his most active periods of growth. At the same time, these teeth stimulate the growth of the jaws through mastication. The primary teeth also serve a aesthetic function by improving the appearance and the speech of the child. There is a direct time relationship between loss of a primary tooth and the eruption of its permanent successor. This time interval may be disturbed by early extraction. The retention of the deciduous dentition until its normal time of exfoliation is acknowledged to be of great importance to the child. The retention of the deeply carious second molar in a preschool child (before eruption of the first permanent molar) is one of the most valuable services that

can be provided for the child. Cellulitis of odontogenic origin is an acute, deep, and diffuse inflammation of the subcutaneous tissue that spreads through the spaces between the tissue cells to several anatomic regions, tissue spaces, and throughout the aponeurotic plane because of the infection of one or several teeth or due to dental or supportive tissue-associated pathologies.

## A CASE REPORT

A 4 year old male patient reported to the Department of Pediatric and Preventive Dentistry, Rama Dental College, Hospital and Research Centre with a chief complaint of severe pain and swelling in upper left back teeth region of the jaw since 4-5 days.

Extraoral swelling was present and was tender (Figure 1). Fever and lymphadenopathy were present.





**Figure 1: Extraoral preop photograph with swelling on his left side**

Medical history was not significant. On clinical examination 64 was carious (Figure 2). It was tender on percussion. Radiographically there were deep carious lesions involving pulp irt 64 (Figure 3). There was a similar carious lesion involving pulp irt 54 (Figure 4) and if not treated on time may progress similarly. Diagnosis of cellulitis was made. Isolation using cotton rolls and saliva ejector was done. Removal of the dental caries and the overhanging enamel was planned to provide good access to the coronal pulp, using a high-speed fissure bur. Access to the pulp chamber was gained after removal of all carious tooth structure.

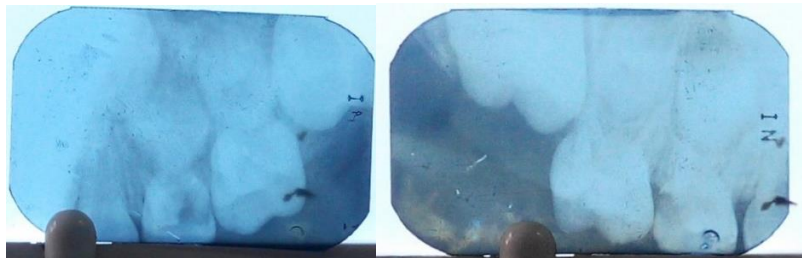
The pulpal debris were removed. Drainage was set up by opening the pulp chamber. Open dressing was given and the patient was prescribed analgesics

and antibiotics. The child was re-appointed after 3 days to proceed with the treatment. There were no signs of inflammation and most of the swelling subsided. The working length was determined. K-Files were used to enlarge the canals up to size 35 to 40. Root canals were irrigated with saline, hydrogen peroxide and dried with sterile paper points. Closed dressing was given. During the next appointment, as there were no signs and symptoms of pain or swelling, obturation was done with metapex and the tooth was restored with stainless steel crown (SS crown) (Figure 5 & Figure 6). After treating 64, pulpectomy was done for 54 as well and was finally restored with stainless steel crown (SS crown) in the following appointments (Figure 7 & Figure 8).

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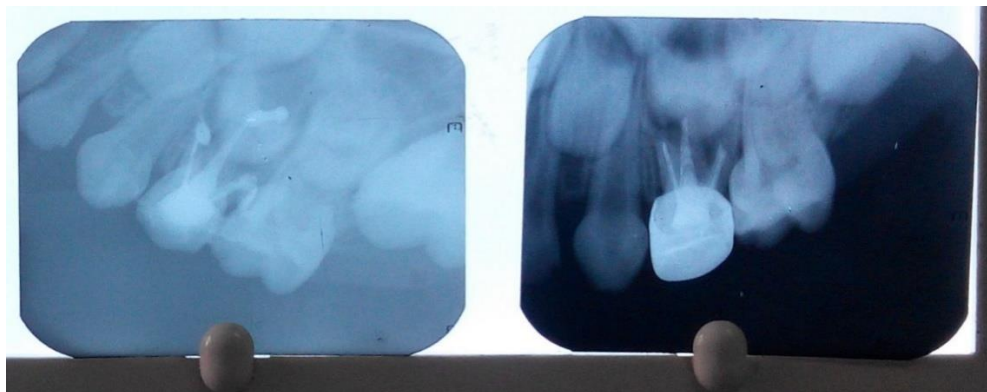


**Figure 2: Intraoral Pre-Treatment Photograph**



**Figure 3: Preoperative IOPAR irt 64**

**Figure 4: Preoperative IOPAR irt 54**

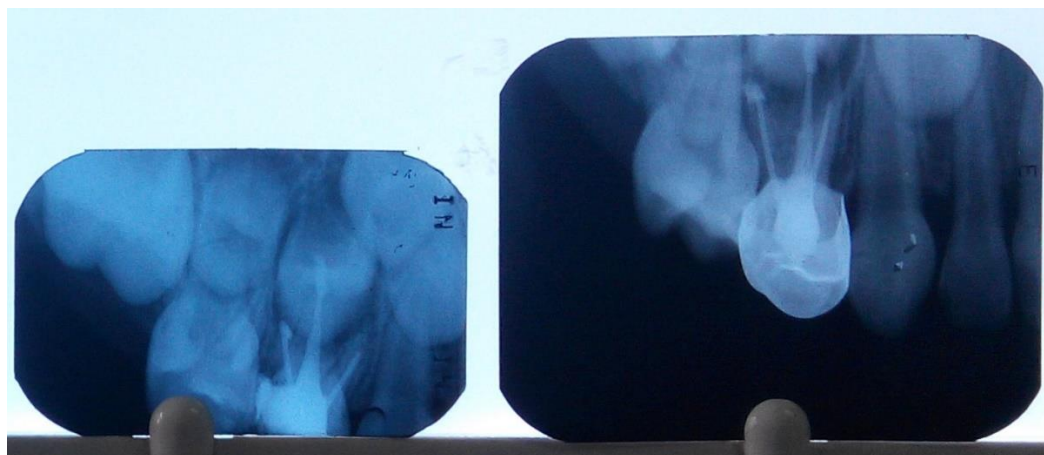


**Figure 5: Postobturation IOPAR and SS crown IOPAR irt 64**

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**Figure 6: Pretreatment, Mid-Treatment & Posttreatment Photograph**



**Figure 7: Postobturation IOPAR and SS Crown IOPAR irt 54**



**Figure 8: Postoperative Intraoral Photograph**

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## DISCUSSION

The progress of dental caries leads to destruction of enamel and dentin which enables bacteria to enter the pulp chambers and root canals. Untreated carious lesions of primary molars most commonly develop abscesses of the bifurcation area, whereas the carious process in permanent molars tends to develop periapical abscesses.<sup>5</sup>

Depending on the host's immune response, bacterial load, and virulence, inflammation may spread beyond the apical area of the tooth, resulting in an *acute apical abscess*. This is evident clinically by the presence of an intraoral swelling, typically located within the buccal

vestibule apical to the tooth root. This situation is ideally managed by a dentist through removal of the tooth or extirpation of the necrotic pulp tissue and/or incision and drainage of any fluctuant abscess. If immediate dental management cannot be arranged, empirical broad-spectrum antibiotic coverage should be considered, especially if the patient has any underlying medical conditions that could reduce bacterial resistance (eg, diabetes). Dental infections are typically caused by normal oral flora. During the first 3 days of the process, facultative Gram-positive oral streptococci predominate. The antibiotic of choice during

this early period is penicillin VK 500 mg by mouth every 6 hours for 7 days.<sup>6,7</sup>

Amoxicillin—500 mg every 8 hours—is an acceptable alternative. The antibiotic which is usually used for acute oral infections in children is oral amoxicillin, usually prescribed at doses of 20-40mg/kg/day, in three divided daily doses for five days.<sup>8</sup> If the swelling has been present for more than 3 days or is unresponsive to penicillin therapy, metronidazole (250 to 500 mg by mouth every 6 hours) may be added.<sup>10</sup> For the children who are allergic to penicillin, oral clindamycin at doses of 15-25mg/kg/day in three or four equal daily doses is an effective alternative.<sup>8</sup> The pain should be managed with appropriate analgesia such as a nonsteroidal anti-inflammatory drug (NSAID) or a weak opioid combined with an NSAID or acetaminophen in an appropriate quantity to last until the dental appointment.

This infection has the potential to develop into a true medical emergency if not treated promptly and aggressively. Cellulitis, characterized by painful swelling, regional lymphadenopathy, and in many cases fever, may rapidly develop if the infection is allowed to spread into the surrounding fascial planes. Serious complications can include compromised breathing (Ludwig angina) for infections of mandibular origin and orbital or cavernous sinus involvement for maxillary infections.

Management of localized pulpal infections in the primary dentition includes pulpectomy or extraction followed by space maintenance. On the other hand, the treatment of a spreading, acute dental abscess centres on pain control, antibiotics, incision and drainage and removal of the source of infection, which may include endodontic treatment or extraction of the tooth. Hospitalization and parenterally administered antibiotics may be required for children who show spread of the dental infection.

Conservative treatment of the pulpally involved primary teeth is often necessary to avoid

premature loss of deciduous teeth. Premature extractions may lead to loss of space and subsequent problems concerning the development of malocclusion.<sup>10</sup> The primary tooth is accepted as the guide and guard for the permanent dentition and it is considered to be the best space maintainer.

Coll et al stated that the tooth is the best space maintainer in primary dentition, and pulp treatment with an adequate filling material would be ideal for primary teeth and necrotic pulps, abscesses, fistulae and mobility that otherwise would be indicated for extraction.<sup>11</sup> In general, the same principles of initial evaluation and management apply to the primary and permanent dentition. However, carious lesions of the primary teeth less frequently cause pain and abscesses and more frequently drain cutaneously than lesions of the permanent dentition. The systemic effects of infection are more pronounced in children, with rapid temperature elevations, greater risk of dehydration, and more rapid spread of infection.<sup>12</sup> Unless the patient has been adequately treated with antibiotics to ensure an effective blood level, the patient is at risk of the bacterial shower in the circulation produced by surgical manipulation in an abscessed area.<sup>13</sup> Nevertheless, it is advantageous to keep the offending tooth once the acute phase of the infection has been controlled.

It was found by Cardoso and Michell that it was difficult to classify the periapical lesions on deciduous and permanent teeth as granulomas, abscesses or cysts, because the lesions were mixed but mostly could be called granulomas. Several lesions were clearly abscesses but many were combinations. They also found that deciduous teeth were more rapidly involved than permanent ones.<sup>14</sup> Since the use of antibiotics is restricted to severe and complicated abscess infections, it seems judicious to use amoxicillin, a semisynthetic penicillin with a broader spectrum of antimicrobial activity than penicillin V. In addition, amoxicillin may provide more rapid

improvement in pain or swelling, and patient compliance with the prescribed regimen may be better because of the longer dosage interval of amoxicillin.<sup>15</sup> In even more serious cases, including life-threatening conditions, association of amoxicillin with either clavulanic acid or metronidazole may be required to achieve optimum antimicrobial effects as a result of the spectrum of action being extended to include penicillin-resistant strains. In this case both amoxicillin and metronidazole were prescribed.<sup>15</sup>

### CONCLUSION

Dental caries can be avoided in children by decreasing consumption of sugar-containing food items and engaging them in regular tooth brushing and with appropriate fluoride use. Regular dental examinations with prompt treatment of carious lesions can substantially reduce the risk of severe complications. It is vitally important to have a pediatric dentist available at the hospital to treat this type of conditions and the complications that may develop due to dental infection.

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