



Conservative Management of Maxillofacial Infections Related to Dental Caries: A Case Series

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Abstract

Dental caries is an irreversible microbial disease of the teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth leading to cavitation. Lack of treatment of carious teeth in the initial stages often leads to pulpitis and other complications like abscess, maxillofacial space infection, osteomyelitis etc. Prompt management of such maxillofacial space infection via conservative or surgical approach is necessary as maxillofacial space infection might be fatal if neglected. This case series highlights the conservative management of such neglected maxillofacial space infection and chronic osteomyelitis related to carious teeth in three paediatric patients.

Introduction

Dental caries is an irreversible microbial disease of the calcified tissues of the teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth, which often leads to cavitation.¹ There are three different layers in the coronal part (Enamel, dentin and pulp) as well as in the radicular part (Cementum, dentin and pulp) of a tooth. If left untreated, enamel caries progresses through the dentin to the pulp (Pulpitis). Since the infected pulp remains in the confined chamber, patient may experience severe persistent pain (Toothache). Necrosis of the pulp eventually occurs which is then followed by inflammation of the peri-radicular area (Apical periodontitis and periapical abscess). If left untreated, infection results into complications like gingival abscess, maxillofacial space infections (MSI), sinus formation, granuloma, or cyst.^{1,2} Space infections caused due to dental caries should be managed by endodontic treatment or extraction of the associated tooth / teeth and prescription of oral or parenteral antibiotics. In some cases, intraoral or extraoral incision and drainage (I / D) of the pus facilitates for pus drainage and timely resolution of the space infection.^{3,4} This case series highlights the conservative management of MSI and chronic osteomyelitis related to carious teeth in three paediatric patients.

Case 1

A six-year-old female patient reported to the Department of Pedodontics with the complaint of swelling on the left side of face for three days. On examination, left side of the face was swollen (Figure 1a, 1b) with the presence of multiple carious teeth intraorally (Figure 1c).





Figure 1:

1a, 1b: Pre-operative extraoral photographs;
1c, 1d: Pre-operative intraoral photographs;
1e, 1f: Pre-operative intraoral periapical radiographs.

Intraoral periapical radiograph (IOPAR) revealed radiolucency involving enamel, dentin and pulp with respect to (wrt) 64 (Figure 1f). Diagnosis of the left side canine and buccal space infection wrt carious 64 was made. Access opening of 64 was done immediately followed by prescription of oral antibiotics (Amoxicillin 250 mg + Clavulanate Potassium 125 mg and Metronidazole 200 mg) and analgesics (Ibuprofen 200 mg + Paracetamol 250 mg). Facial swelling resolved completely within seven days. Comprehensive treatment was provided on the subsequent follow-up visits (Figure 2).



Figure 2:

2a : Post-operative extraoral photograph;
2b, 2c: Post-operative intraoral photographs;
2d: Post-operative intraoral periapical radiograph of 64;
2e, 2f, 2g: 22-month follow-up intraoral photographs.

A six-year-old male patient reported with a chief complaint of swelling on the left side of face for four days. On examination, the facial swelling (Figure 3a) was associated with multiple carious teeth (Figure 3b, 3c, 3d). Intraoral periapical radiograph revealed radiolucency involving enamel, dentin and pulp wrt 64 and 65 (Figure 3e). Final diagnosis was left sided canine and buccal space infection wrt carious 64 and 65. Access opening of 64 and 65 was done on the first day along with prescription of oral antibiotics and analgesics. Complete resolution of facial swelling was observed on the follow-up visit on fifth day. Comprehensive treatment was provided on the subsequent follow-up visits (Figure 3g, 3h, 3i, 3j).



Figure 3:

3a: Pre-operative extraoral photograph;
3b, 3c, 3d: Pre-operative intraoral photographs;
3e: Pre-operative intraoral periapical radiograph;
3f: Post-operative extraoral photograph;
3g, 3h, 3i: Post-operative intraoral photographs;
3j: Post-operative intraoral periapical radiograph.

Case 3

A 10-year-old male patient was referred by a paediatrician due to the presence of extraoral sinus in the lower jaw. The patient gave the history of antibiotic intake multiple times but no resolution of the occasional tooth pain and drainage from the left jaw. On examination, there was sinus opening on the lower border of the left side of mandible (Figure 4a). Intraorally, there was carious 36 (Figure 4b) with the IOPAR findings showing involvement of enamel, dentin, pulp and the peri radicular areas (Figure 4c). The final diagnosis of chronic periapical abscess wrt 36 and chronic osteomyelitis was made. Root canal treatment (RCT) of the carious 36 was performed followed by the provision of stainless-steel crown. Complete resolution of the extraoral sinus was observed on the follow-up visit of three months (Figure 4d, 4e, 4f).

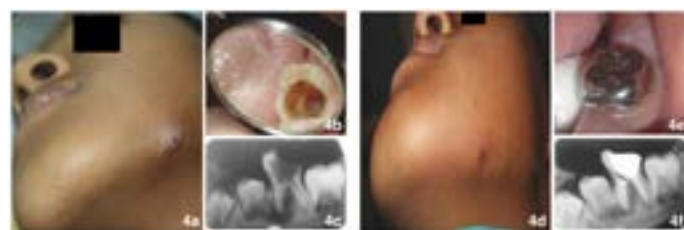


Figure 4:

4a: Pre-operative extraoral photograph;
4b: Pre-operative intraoral photograph;
4c: Pre-operative intraoral periapical radiograph;
4d: Post-operative extraoral photograph;
4e: Post-operative intraoral photograph;
4f: Post-operative intraoral periapical radiograph.

Discussion

Dental caries is one of the most common causes of MSI. Apart from dental caries, MSI often arises as the sequelae of pulpitis resulting from periodontitis or trauma.^{3,4} Other non-odontogenic causes of MSI include submandibular gland sialadenitis, lymphadenitis, peritonsillar / para-pharyngeal

abscess, trauma, or surgery.⁵

Maxillofacial space infections are usually the presentation of neglected dental care.^{4,6} Space infections progress rapidly in children. This prompts for the treatment of affected tooth / teeth (Access opening or extraction) to facilitate pus drainage along with the broad-spectrum antibiotic coverage to prevent further progression of the swelling and other possible complications like fever, dehydration, trismus, airway obstruction, cavernous sinus thrombosis, septicemia and even death.³⁻⁸ In majority of the cases, oral antibiotics suffice but in case of patients showing signs of systemic toxicity, parenteral antibiotics are indicated. Both aerobic and anaerobic microorganisms are responsible for MSI. Hence, the combination of penicillin and beta-lactamase inhibitor (Amoxicillin / clavulanate, ticarcillin / clavulanate, piperacillin / tazobactam), cefoxitin, carbapenem, or clindamycin are effective. Antibiotics like macrolides or ketolides combined with metronidazole should be prescribed for those patients allergic to penicillin. Empirical antibiotics are prescribed initially, and medications can be changed in non-responsive cases after the culture report.^{5,9} In the present cases of MSI, combination of oral amoxicillin / clavulanate and metronidazole was prescribed; whereas for the case of chronic infection with osteomyelitis, treatment of dental infection sufficed for the complete recovery.

Access opening should be followed by cleaning, shaping and obturation of root canals during the subsequent visits. In this way the affected tooth is saved, and the masticatory function, speech and esthetics is preserved. As the spread of infection occurs first in the intraoral site (gingiva, vestibule), access opening or extraction of the affected tooth / teeth, intraoral I / D and antibiotics usually results in complete recovery. Extraoral I / D is better attempted only if there is pus accumulation and definite dependent site extra orally, or when there is no sign of improvement after initiation of access opening or intraoral I / D or extraction. In the authors experience, advantage of intraoral I / D is that there is no chance of unsightly permanent scar as encountered in the extraoral I / D site. Extraction of the offending tooth/teeth should be done only if the prognosis of the tooth is poor.³ Since extraction is an irreversible process, provision of space maintainer or prosthesis as per the need in the edentulous site should be done on the subsequent visits.¹⁰

Conclusion

Maxillofacial space infection is a dental emergency which demands for prompt management. In the present case series, MSI and chronic osteomyelitis resulting from decayed teeth in paediatric patients were managed by pulpectomy / RCT of the offending tooth/teeth and prescription of antibiotics. Whenever possible, conservative management should be opted as most of the infections related to decayed tooth / teeth can be successfully managed conservatively.

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