SUBMANDIBULAR SPACE INFECTION: A CASE REPORT

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ABSTRACT

Isolated cases of space infections from primary teeth with a systemic condition are usually rare. If such cases occur, the ensuing systemic condition causes easy spread of infection causing involvement of several tissue spaces. In this condition, evaluation and care of systemic infection is of utmost importance in conjunction with local oral etiology. Common systemic cause of facial infection is resistance to commonly used antibiotics. In following case, both the systemic as well as local oral etiology was taken care.

KEYWORDS: Antibiotic resistance, Neutropenia.

INTRODUCTION

Space infection is infection spreading to the Facial Spaces in the head and neck region from one or many teeth infected. Fascial tissue spaces are potential spaces that exist between the fasciae and underlying organs and other tissues. In health, these spaces do not exist; they are only created by pathology, e.g. the spread of pus or cellulitis in an infection. The fascial spaces are different from the fasciae themselves, which are bands of connective tissue that surround structures, e.g. muscles. The opening of fascial spaces may be facilitated by pathogenic bacterial release of enzymes which cause tissue lysis (e.g. hyaluronidase and
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collagenase). The spaces filled with loose areolar connective tissue may also be termed clefts. Other contents such as salivary glands, blood vessels, nerves and lymph nodes are dependent upon the location of the space. Those containing neurovascular tissue (nerves and blood vessels) may also be termed compartments.

From the mandibular molars the fascial spaces involved are vestibular, buccal, submandibular or sublingual whereas that from the maxillary molars the space usually involved is infraorbital. The route of facial infection usually depends on the configuration of roots, position of roots in the bone, and thicknesses of bony plates. The rarity of infection spread is also limited amounting to good immunity in child patients.[1,2]

CASE-REPORT

A 18 year old female reported to us with a severe swelling involving grossly decayed 48 in right lower back tooth region. There was no history of cough, dyspnea, and stridor. On examination, the patient had a temperature of 38.6°C, pulse of 112, and respiratory rate of 22. Extra-oral examination revealed 3*2 cm swelling involving the right lower facial region, it was tender to touch, redness and local raised temperature was also evident. Submandibular and sublingual lymphnodes on right were palpable and tender to touch.

Intra oral examination revealed a grossly decayed tooth #48 (FDI notation) along with other carious teeth #36, 25. Intraorally there was slight puffiness in the vestibule surrounding teeth #48 and #47. High plaque deposits denoting poor oral hygiene was also evident.

Provisional diagnosis: Submandibular space infection of right side and irreversible pulpitis of tooth #48. Investigations: Intraoral periapical view of tooth #48 and routine blood investigations. Radiographs confirmed pulpal pathosis of tooth #48. Routine blood investigations showed slight neutropenia.

Final diagnosis: Submandibular space infection of left side and acute irreversible pulpitis of tooth #48. Neutropenia due to unknown etiology.

Treatment done

Emergency access opening was done under local anaesthesia to create a drainage path but no discharge was evident from the root canals of #48, the canal was left open by placing a loose cotton dressing to maintain the patency. The patient was kept on antibiotics for three days and was recalled. During the subsequent visit the swelling was still evident. It was therefore
decided to drain the pus extraorally. Patient was prepared after taking a thorough consent from the parents. Proper aseptic protocol was taken to ensure no infection occurred concomitantly. Area was scrubbed with 10% povidone iodine solution, anaesthetic spray was applied and local infiltration was done, then with a help of #15.

![Figure 1: Pre-operative swelling view.](image1.png)

BP blade a stab incision was given in the most dependent part and Hilton method applied. Care was taken to ensure the incision was parallel to the skin crease to avoid the scar formation due to esthetic reasons. The purulent discharge was collected and sent to department of microbiology for further investigations like gram staining and antibiotic sensitivity. After draining the discharge, taping was done and the patient was discharged and was continued on same medication till the sensitivity report was sought. Gram stain indicated abundant gram positive cocci.

![Figure 2: incision and drainage.](image2.png)
Antimicrobial sensitivity studies were done for aerobic pathogens. Anaerobic pathogens did not undergo antimicrobial sensitivity or beta-lactamase testing. The report revealed Staphylococcus aureus as the principal bacteria. Regarding antibiotic sensitivity it was found to be resistant to Ampicillin 11 (R), among the other drugs tested it was found to be sensitive were Clindamycin 25(S), Erythromycin 24(S), Gentamycin 18(S) & Linezolid 32(S).

After the sensitivity report the patient was placed on erythromycin 250 mg b.i.d for 5 days. Tab Brufen was administered on a S.O.S. basis. It was during this visit the RCT was completed by cleaning and shaping the canal upto #35 file along with copius irrigation with normal saline and chlorhexidine. The canal was simultaneously filled with Metapex. Temporary filling was done and the patient was recalled after 5 days. During subsequent visit the lesion showed drastic improvement. During this visit permanent filling was done with G.I.C. and a stainless steel crown was placed on the tooth. Patient was again recalled after 2 weeks to see the healing.

![Figure 3: 10 days post operative view.](image)

**DISCUSSION**

It is not often to see a primary tooth involving fascial spaces. Low involvement of facial spaces in children is related to 1) Drainage through thin and porous furcal bone 2) porous and less calcified bone that easily provide pathways for early movement of infections into oral cavity, 3) small length of roots of primary teeth, 4) high immunity associated with growing child.\[1,3\]

In present case the child’s blood report revealed neutropenia but the cause somehow was undermined. May be the associated neutropenia could have exacerbated the inability of the
child to fight off infection- resultant the infection spread to vestibular and buccal spaces. Spreading infections are a serious concern in children because of ensuing Ludwig’s angina. It is a serious emergency in children due to severe dyspnoea (greater tongue fall back associated in children), narrower airway (lumen of larynx is very less developed), asphyxia (children have greater respiratory rate).

All of these can precipitate a severe emergency and prevention of which is of utmost importance. The predominant pathogens included in children usually include the gram-positive organisms such as beta-hemolytic streptococci (18%) and S. aureus(18%). Prevalent anaerobic pathogens included B. melanogenicus(17%) and Veillonella species (14%).\textsuperscript{2,3}

This incidence of Veillonella species is higher than that reported in other studies. Antibiotics covering gram positive, anaerobic, gramnegative, and beta-lactamase-producing organisms should be selected for empiric therapy pending more specific culture and sensitivity results.\textsuperscript{4}

It is important to adequately treat the etiologic focus of infection that led to the subsequent head or neck space infection. In present case although emergency access opening was done to allow for pus drainage and lower spread of infection; the ensuing neutropenia systemically could not take care of buccal space infection necessitating direct drainage of infection.\textsuperscript{5,6}

The infection at last was brought to control due to proper selection of broad spectrum antibiotics, local drainage of infection and proper debridement of root canals.\textsuperscript{7,8}

REFERENCES
