



CASE REPORT

TEMPORAL SPACE INFECTION SECONDARY TO RECURRENT BUCCAL SPACE INFECTION FROM MANDIBULAR DECIDUOUS MOLAR IN 7-YEAR-OLD CHILD: A CASE REPORT

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ABSTRACT

Head and neck space infections are usually secondary to odontogenic infections due to translocation of oral microbes to fascial space via odontogenic route resulting in progression by enzymatic degradation of connective tissue. Various factors like microbiological, host, nutritional and socioeconomic factors are responsible for progression of fascial space infection that might take fatal course if not treated in time. The present case report describes a child with fascial space infection of oral and maxillofacial region who was treated by incision and drainage in department of oral and maxillofacial surgery of this hospital. Fascial space infections are one of the surgical emergencies and need to be addressed in early stage as it has rapid regional and systemic progression leading to fatal outcome. It is multifactorial and all need to be addressed. Incision and drainage with removal of cause with antimicrobial therapy is treatment modality of space infection. Inadequate drainage might lead to recurrence of infection and progression to distant secondary spaces.

INTRODUCTION

Odontogenic infections are infections that originates from tooth or its supporting structures. Odontogenic infection arises when oral flora becomes pathogenic after translocation in tooth or its supporting structures resulting in deep caries, pulpitis and periodontitis, from where infection can spread beyond alveolar process to deeper tissues of the face, oral cavity, head and neck. Major pathogens of odontogenic infections are *Streptococcus milleri*,

Fascial spaces in head and neck are the potential spaces between layers of fascia normally occupied by loose connective tissue and bounded by anatomical layers such as fascia, bone and muscles. Odontogenic infections usually progress to involve primary spaces of maxillofacial area then to secondary spaces, as fascial spaces are linked so infections propagate from one space to another. Direct involvement of secondary space is unlikely and involvement of temporal space is very rare.² If untreated it might progress systemically which might have life

threatening outcome.

Bacteria initially inoculate into deeper tissue of primary fascial spaces of maxillofacial region to synthesize hyaluronidase, streptodornase and streptokinase which results enzymatic degradation and dissolution of fibrin and connective tissue in fascial spaces to initiate cellulitis.³

Many factors are responsible for space infections like decreased host defense, increased bacterial resistance, nutritional status of the patient, virulence of bacteria also with socio economic status and local factors like hygiene of the patient. In this article we reported the case of fascial space infection which first involved buccal space which migrated to superficial temporal space even after drainage from primary space.

CASE REPORT

A 7 years old boy presented with pain in mandibular right 2nd deciduous molar for 3 days in department of pediatric dentistry and was diagnosed chronic irreversible pulpitis hence pulpectomy was started.



Figure 1. Preoperative buccal and temporal space swelling

After 2 days, the patient developed swelling in cheek region in right side due to which he was referred to oral and maxillofacial department for evaluation and management of case. On general examination patient was found with toxic appearance, dehydration and mild pyrexia. On examination of head and neck there was facial asymmetry due to a diffuse swelling on right side of face, extending antero-posteriorly from angle of mouth to angle of angle of mandible, superior-

inferiorly from zygomatic prominence to angle of mandible, overlying skin was reddish and tense, surrounding tissue was normal, with compromised neural function in right side. Temperature over the swelling was raised and was tender and firm in measuring 4x5 cm. Oral opening was limited to 2 cm and lateral movement was also restricted. Intra-orally there was decayed right mandibular deciduous 2nd molar. Orthopantomogram was done then ultrasonography was done to see extension of swelling.



Figure 2. Drainage of buccal space via intraoral buccal approach

Patient was diagnosed as case of buccal space infection in right side and cause was identified as decayed mandibular deciduous second molar of same side. All base line investigation was done for general anesthesia. Incision and drainage of infection was performed via intra oral vestibular approach along with extraction of decayed tooth of same side. Empirical I.V antibiotics Ceftriaxone and Metronidazole with analgesics were given. In first post-operative day toileting of space was done with povidone iodine solution. And same treatment was continued in next POD.

In third POD swelling in buccal area reappeared and diffuse swelling developed in temporal region, extending from temporal line to 3 cm below superior-inferiorly and hair line to 3 cm antero-posteriorly. The swelling was diffuse, tense, tender firm with raised temperature and overlying skin was reddish, compromised temporalis muscle function and oral opening was limited. Ultrasonography was performed again and diagnosed as superficial temporal space infection on right side with recurrent

buccal space infection. Incision and drainage by Hilton's method was performed under general anesthesia via temporal approach with placement of corrugated rubber drain in-situ and for buccal space infection incision and drainage was performed via intraoral buccal approach with placement of corrugated rubber drain in-situ. Pus was sent for culture and sensitivity and I.V Ceftriaxone and Metronidazole was continued with analgesics.



Figure 3. Placement of corrugated rubber drainage for superficial temporal space

Culture and sensitivity showed insignificant result so same drugs were continued. Toileting of spaces was done after alternate day. Drain was removed in 3rd POD.

Swelling got subside and drainage get stopped in 4th POD, total oral opening was achieved in same day so temporal stoma was closed by suturing. Patient was discharged in 7th POD after completion of I.V antibiotic dosage. Patient was recalled after 5 days for follow up and the clinical outcome was satisfactory.

DISCUSSION

Temporal space infections are rare and less reported in literature because of complex anatomy of the space and is secondary to other fascial space and its retrograde direction. Most commonly abscess in this space have been reported secondarily to maxillary sinusitis, maxillary sinus fracture, buccal space or vestibular infection from maxillary molars.²

Buccal space is primary space which lies superficial to buccinator muscle and deep to platysma or superficial

fascia. It communicates with sub-mandibular space, pterygomandibular space, sub-masseteric space canine space and lateral pharyngeal space.⁴

Temporal space is divided into superficial and deep temporal space. Superficial temporal space is between temporalis fascia and temporalis muscle and deep temporal space between temporalis muscle and skull. The zygomatic arch separates sub-masseteric space with superficial temporal space and lateral pterygoid muscle separates pterygomandibular space with deep temporal space. Inferiorly this space continues to sub masseteric space. Deep temporal space inferiorly communicates with infratemporal space. Temporal space along with infratemporal, sub-masseteric and pterygomandibular space altogether known as masticatory spaces.^{2,4}

In this case temporal space infection seems to get spread from mandibular molar and first space to involve was buccal space as primary space which was drained via intra oral approach. The propagation of infection in retrograde direction is unlikely until and unless there is inadequate drainage, decreased host resistance to microorganism and increased resistant to antibiotics.²

Decreased host defense and virulence of microorganism plays important role in spread of infection,⁵ which might be another cause and patients parent gave history of taking inadequate nutritious diet by child and not taking diet since he experienced pain for the first time that was around one week back leading to nutritional deficiency. Also, the socioeconomic factor might have contributed to spread of infection as patient was from poor family.⁶

Established treatment of fascial space infection is incision and drainage or decompression of space with administration of broad-spectrum antibiotics and analgesics with pus for culture and sensitivity and administration of specific antibiotic according to culture and sensitivity report.⁷

Established first line of treatment of infection in children include administration of beta lactam antibiotics with metronidazole,^{6,8,9} so culture and sensitivity were not done in first stage of treatment but when infection did recur then pus was sent for culture and sensitivity which revealed insignificant result. Insignificant result might be due to existing

antibiotic therapy.

Intra oral approach might not be appropriate approach for draining buccal space as muscle lies in between and gravity doesn't come in play for dependent drainage. Various literatures also suggests to drain outer buccal space via extra oral or submandibular approach.

After draining via temporal approach infection subsided as it got two-way access that allows adequate drainage of space which is must in case of space infection.

CONCLUSION

Space infection has multifactorial cause and all the cause need to be addressed. Treatment of space infection is incision and drainage with removal of cause with empirical antibiotic and specific antibiotic after culture and sensitivity of drained pus. While treating space infection every possible attempt for complete evacuation of the space to be done. Inadequate drainage can result in recurrence and spread of infection to neighboring spaces and systemically.

Temporal space infection is very uncommon because of its superficial and cranial anatomy and retrograde spread of infection from primary space against gravity is very unlikely. Early detection and treatment of primary space infection can prevent temporal space infection. Via temporal approach temporal space infection can be successfully drained. Intra oral buccal approach could be employed for better access and adequate drainage of buccal space rather than vestibular approach.

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