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Odontogenic Space Infections in Pediatric Patients: A Case Series

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Abstract: ***Paediatric odontogenic space infections, constitute a rare but potentially life-threatening polymicrobial condition originating from untreated dental caries, periapical abscesses, dental trauma, or post-procedural complications in the head and neck region, exacerbated by poor oral hygiene and delayed dental care. This case series reports multiple paediatric patients exhibiting classic symptoms such as facial swelling, intense pain, fever, trismus, dysphagia, and potential airway compromise, confirmed via thorough clinical evaluation, detailed history, and radiographic imaging (IOPA/CT) demonstrating pulp pathology, PDL widening, and infection spread. Effective treatment prioritized source elimination through incision and drainage, extraction or pulpectomy, combined with broad-spectrum antibiotics, analgesics, and close interdisciplinary coordination with infectious disease experts, successfully averting dire sequelae including Ludwig's angina, mediastinitis, or sepsis. These findings highlight the imperative for rapid diagnosis and aggressive intervention by paediatric dentistry teams to safeguard young patients from severe complications.***

Keywords: Buccal space infection; Space infections

1. Introduction

Odontogenic space infections in children represent a significant clinical challenge in pediatric dentistry, originating predominantly from untreated dental caries, pulpal necrosis, or periodontal pathology in primary or permanent teeth. These infections spread through fascial planes due to the loose connective tissue architecture in young patients, where thinner cortical bone and higher lymphatic drainage facilitate rapid progression compared to adults. Common pathogens include polymicrobial flora such as Streptococcus species, anaerobes like Prevotella and Fusobacterium, and occasionally Staphylococcus, often leading to abscess formation in spaces like buccal, submandibular, or canine regions.[1]

Children aged 2-8 years are most affected, with primary molars (especially first molars) implicated in over 60% of cases due to their proximity to the mylohyoid ridge and high caries prevalence. Risk factors encompass poor oral hygiene, malnutrition, immunocompromise (e.g., diabetes or HIV), and delayed dental access, exacerbating spread to deep spaces like the submental or masticator. Incidence is higher in developing regions, with studies reporting up to 70% of paediatric orofacial infections being odontogenic.[2]

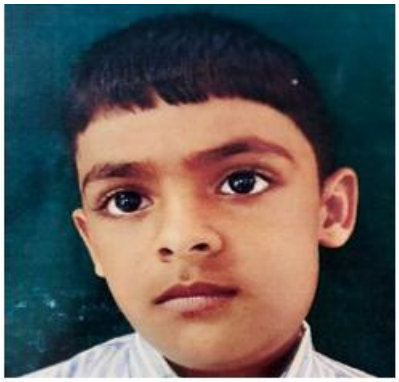
Symptoms manifest acutely with facial swelling (often unilateral), trismus, fever, dysphagia, and elevated inflammatory markers (CRP, WBC). Advanced signs include airway compromise (e.g., stridor in Ludwig's angina) or systemic sepsis, necessitating urgent evaluation via CT imaging to delineate extent and exclude complications like mediastinitis.[13] Odontogenic origin is confirmed clinically by percussion tenderness and radiographically by periapical radiolucency[3]

Diagnosis integrates history, exam, labs, and imaging (panoramic X-ray or CT), with aspiration for culture guiding antibiotics.[12] Management follows AAPD guidelines: secure airway if needed, administer IV antibiotics (e.g., amoxicillin-clavulanate + metronidazole), perform incision/drainage under GA, and extract/source control the offending tooth. Hospitalization is common for severe cases, with 80-90% resolving within 48-72 hours post-intervention.[4]

2. Case Reports

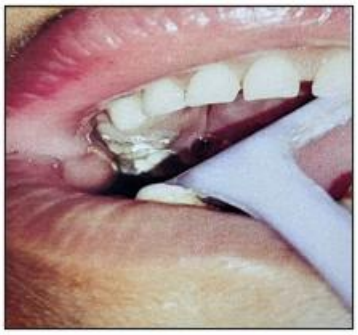
A 6-year-old boy presented to the Department of Paediatric and Preventive Dentistry, KVG Dental College and Hospital, with the chief complaint of pain, swelling in the lower right posterior region, and fever for the past 3 days. The history of presenting illness revealed sudden-onset, continuous pain radiating to the left temporal region, aggravated during mastication, with initially mild swelling that progressively increased; no relevant prenatal or medical history was noted.

Extraoral examination showed normal gait, height, weight, and orientation to time and place, with a mesocephalic head shape and mesoprosopic facial form; facial asymmetry was evident with restricted mouth opening. On palpation, the left side of the face exhibited firm-to-hard, tender, ovoid swelling measuring approximately 3 × 3 cm in relation to teeth 54 and 55, along with tenderness over the mandibular body and palpable submandibular lymph nodes.

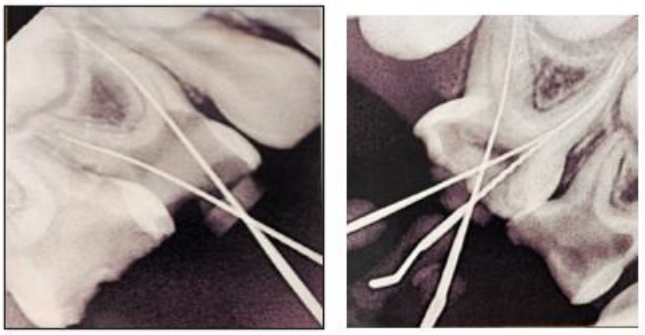


Pre- Operative Picture

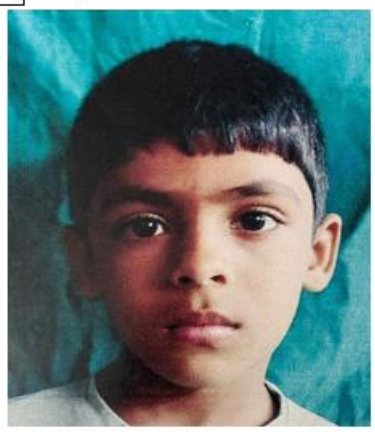
Lateral View of Patient



Intraoral picture showing swelling wrt 54 55



Working Length Determination WRT 54 55



Post Operative Picture

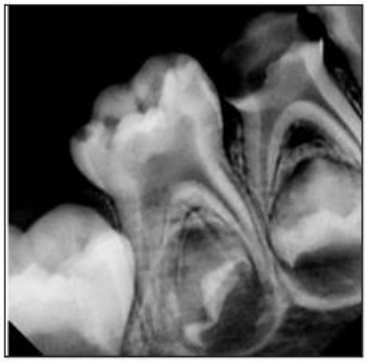
Intraoral examination revealed slight palatal swelling around 54 and 55, obliterated mucobuccal fold extending to the submandibular region, and deep dentinal caries with respect to 54 and 55; IOPA confirmed radiolucency indicative of pulp involvement and periodontal ligament widening. Treatment involved posterior superior alveolar (PSA) nerve block supplemented by buccal infiltration anesthesia, followed by a small buccal incision for pus drainage and aspiration; pulpectomy with stainless-steel crown placement for 54 and 55 was planned, and the child was prescribed antibiotics and analgesics postoperatively.

Case 2

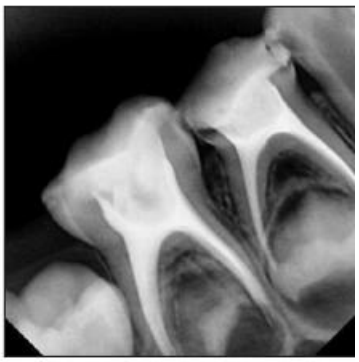
A 6-year-old male patient presented to the Department of Pediatric and Preventive Dentistry at KVG Dental College and Hospital, reporting pain, swelling in the lower right posterior region, and fever for the past four days. The pain was sudden in onset, persistent, and worsened during meals; the swelling began mildly and progressed. He had no significant prenatal or medical history.

The child exhibited normal gait, height, and weight, with good orientation to time and place. He displayed a mesocephalic head shape and mesoprosopic facial form. Extraoral assessment revealed facial asymmetry and limited mouth opening on the right side. Palpation showed swelling and tenderness over the mandibular body, along with palpable submandibular lymph nodes.

Pre- Operative Photograph



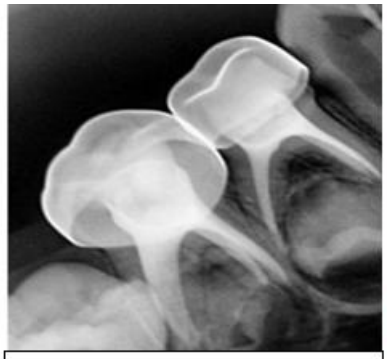
Deep Dentinal Caries WRT 84 85



Obturation W.R.T 84,85

On Intraoral examination there was slight swelling in the vestibular region around the teeth in respect to 84,85. Deep dentinal caries w.r.t 84 and 85. Mild vestibular swelling involved teeth 84 and 85, with obliteration of the mucobuccal fold extending to the submandibular space. IOPA w.r.t 84 and 85 showed radiolucency suggestive of pulp involvement along widening.

The treatment plan included incision and drainage, followed by pulpectomy and stainless-steel crown on the affected tooth. An inferior alveolar nerve block was administered, a small buccal incision made for pus evacuation, and aspirated material collected. The patient received oral antibiotics and analgesics for supportive care.



SSC W.R.T 84 85

Post Operative Picture

3. Discussion

Anaerobic infections in children arise from normal oral flora and can escalate to life-threatening conditions through rapid fascial spread, particularly in odontogenic cases involving primary molars.[5]These opportunistic pathogens- Fusobacterium, Prevotella, Bacteroides, Porphyromonas, Pepto streptococcus, and streptococci- thrive when mucosal barriers disrupt or host defences weaken, forming polymicrobial biofilms that resist initial containment

In pediatric patients, buccal space infections frequently originate from caries in teeth like the mandibular first primary molar, leading to pulpal necrosis and pus tracking into the loose buccal fat pad.[6] Early features include food impaction, vestibular swelling, mucobuccal fold obliteration, and tender mandibular expansion; untreated spread reaches submandibular spaces via perforations near the mylohyoid.

Children under 6 face heightened risk due to thin cortices and immature immunity, with beta-lactamase-producing anaerobes complicating outcomes. [7]Presentations encompass sharp, meal-aggravated tooth pain, unilateral facial asymmetry, limited mouth opening (trismus), fever, chills, drooling, dysphagia, tachycardia, and palpable lymph nodes.[11] Progression unfolds in phases: inoculation (squishy, vague swelling), cellulitis (diffuse, brawny induration compressing vessels), abscess (localized fluctuance with necrosis), and resolution post-drainage, where delays invite deep neck threats like Ludwig's angina or sepsis.[8]

Odontogenic Buccal Space Infection Symptoms

- Cheek swelling, often unilateral and soft initially
- Localized pain in buccal vestibule and involved tooth
- Tooth tenderness on percussion or chewing
- Food impaction and deep probing around affected teeth
- Mucobuccal fold/vestibular obliteration
- Mild trismus and restricted mouth opening
- Facial asymmetry and mandibular body tenderness
- Palpable submandibular lymph nodes
- Fever, chills, and meal-aggravated pain

Non-Odontogenic Buccal Space Infection Symptoms

- Rapid, diffuse cheek cellulitis (shiny, warm skin)
- Periorbital or nasal bridge inflammation
- High fever and irritability (prominent in infants)
- Minimal dental pain or trismus
- Systemic lethargy, chills, or bacteremia signs
- Skin tenderness without tooth involvement
- Less vestibular changes, more widespread edema

Comprehensive history captures pain characteristics (sudden, continuous), onset duration, and systemic malaise, while exam prioritizes airway patency, vitals, head/neck asymmetry, edema, erythema, and intraoral probing for deep pockets. Imaging (panoramic or CT) confirms periapical rarefaction and space involvement, with cultures guiding targeted therapy amid polymicrobial flora.[9]

Core interventions include securing the airway if compromised, inferior alveolar block, buccal incision/drainage with deep mylohyoid placement, and immediate pulpectomy plus stainless-steel crown for source control.[14] ,[15] Empiric IV/oral antibiotics- amoxicillin-clavulanate, clindamycin, or ampicillin-sulbactam- target aerobes (S. aureus, S. pyogenes, H. influenzae) and anaerobes; evidence supports same-appointment instrumentation/closure of abscessed teeth, yielding low (0.3%) exacerbation rates even with radiolucencies. [10]Follow-up monitors resolution within 48-72 hours, emphasizing prevention via caries control

4. Conclusion

Odontogenic space infections in children, such as buccal and submandibular types, demand prompt multidisciplinary intervention to avert life-threatening complications like airway obstruction or sepsis.Recognize odontogenic symptoms (tooth pain, cheek swelling, trismus) versus non-odontogenic (diffuse cellulitis, high fever).Treat with drainage, pulpectomy/crown, and antibiotics like amoxicillin-clavulanate targeting polymicrobial flora.Routine dental care and caries control ensure optimal outcomes in pediatric cases

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