

## CASE REPORT

# Medical Emergency in Orthodontics: A Case Report of Buccal Space Infection

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## ABSTRACT

**Introduction:** Orthodontic appliances or parts of fixed Orthodontic appliances can occasionally cause problems for the patients and orthodontists. These problems could range from minor discomfort to severe spread of the infection due to soft tissue injury leading to secondary space infections, which need an immediate medical attention and prompt emergency care.

**Case report:** A case of 19-year-old female patient is presented to show the involvement of medical assistance to treat buccal space infection which was secondary to the traumatic ulcer caused by the constant maxillary molar tube injury to right sided cheek mucosa.

**Discussion:** The spaces of the head and neck can allow the spread of the infection from the teeth and the associated oral tissues because the pathogens can travel within the facial planes, by the spread of the related inflammatory exudates. When involved in infections, the space can undergo cellulitis, which can cause a change in the normal proportions of the face.

**Conclusion:** These emergency conditions need the medical and surgical intervention to provide relief to the patient and prevent the spread of the infection into the jaw bone, which could lead to osteomyelitis and other severe problems.

**Keywords:** Orthodontic appliances, Traumatic ulcer, Space infections, Antibiotics.

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## INTRODUCTION

Human body lives in balance with a number of normal microbial flora. However the pathogens can invade and initiate an infectious process occasionally. These infections could be from odontogenic or a non-odontogenic source. The odonto-

genic infection especially from the 2nd and 3rd mandibular molars or as an extension of peritonsillar cellulites, may involve several spaces in the head and neck region including, Buccal space, Buccinator space, Parapharyngeal space, Submandibular, Sublingual, lateral pharyngeal and Pterygoid space.<sup>1</sup> The prototype of sublingual and submandibular infection is Ludwig's angina. Ludwig's angina is caused by the extension of odontogenic infections in 70-80% of the patients.<sup>2</sup> Contributing factors may include teeth extraction, poor oral hygiene and trauma.

The Non-odontogenic infections are secondary infections incited by an infection in the tissues surrounding the oral cavity, such as the skin, tonsils, ears and sinuses. These infections must be diagnosed and treated promptly to avoid any life threatening conditions such as space infection or Cellulitis. The clinical signs and symptoms of which are usually pain, tenderness, redness and diffuse edema of the involved soft tissue space, causing a massive and firm swelling, which is treated by administration of the antibiotics and removal of the cause of infection. A suspicion of necrotizing fasciitis is a surgical emergency, requiring broad spectrum antibiotics, repeated surgical dressing, drainage, intensive medical supportive care including fluid calcium and possibly blood transfusion.<sup>3</sup>

## CASE REPORT

A 19-year-old female patient reported to our department of orthodontics, complaining about swelling in the right side of the face, continuous pain radiating to the temple region for past 2-3 days.

*Past medical and dental history:* There was history of fever and vomiting since 1 week followed by pain which was continuous and radiating to temple region. Swelling of the affected side was since 3 days. Patient was taking self medication (Analgesics and Antipyretics) for pain and fever. The dental history revealed that, the patient had sought orthodontic treatment by a private practitioner, which was begun with extraction of all first premolars for the correction of Bimaxillary protrusion.

## CLINICAL EXAMINATION

*Extra oral examination:* The clinical examination revealed an extra oral swelling of 5 × 4 cm in size, extending superiorly from the line joining the alar edges and the lower

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**Figs 1A and B:** (A) Pretreatment extraoral frontal view  
(B) Pretreatment extraoral profile view



**Fig. 2:** Pretreatment intraoral view showing the traumatic ulcer on right side of cheek mucosa

eye lid, also extending to involve the lower border of the mandible inferiorly on right side of the face (Figs 1A and B).

**Boundaries of swelling:** Anteriorly from the corner of the lip, posteriorly to the pre-auricular region. Skin over the swelling was shiny and stretched, there was a change in the colour of the skin. On palpation tenderness was noticed over the swelling region. No rise of temperature at the swelling site, it was firm in its consistency showing diffuse borders.

**Intra oral examination:** Solitary large irregular shallow ulcer noted over right side of buccal mucosa with sloping borders and covered with necrotic slough. Mild erythema was seen in the surrounding mucosa. The ulcer was noted on the cheek mucosa parallel to the upper molar tube region suggestive of chronic irritation by maxillary molar tube (Fig. 2).

**Summary on clinical examination:** As the intraoral findings were showing a large ulcer on the right side of the cheek mucosa due to constant trauma from upper molar tube, the causative factor for the present illness was considered to be the molar tube impingement into the cheek mucosa causing injury forming a traumatic ulcer and developing into secondary space infection with the route of spread of infection established from the injury site and progressing into this acute condition within 3 days of time period. The systemic condition of the patient was reported as extremely debilitated and dehydrated having fever, malaise, tachycardia and restlessness. The case was referred to Oral and maxillofacial surgery speciality for prompt medical and surgical intervention.

**Radiographic-interpretation:** No obvious bony changes were noted on the OPG (Figs 3A and B) and PNS views. Freshly extracted sockets were noted i.r.t 14 and 44.

The PNS view shows no bony involvement (Fig. 3B).

**Pathologic findings:** The FNAC (Fig. 3C) report showed many poly morphonuclear neutrophils suggestive of acute infection.

**Differential diagnosis:** 1. Impetigo, 2. Erysipelas, 3. Crohn's disease (Recurrent buccal space abscess), 4. Traumatic cheek bite.

1. *Impetigo:* Crusts and pustules seen on the lesion—Ruled out.
2. *Erysipelas:* Rapid onset and dark red swelling with sharply demarcated borders—Ruled out.
3. *Crohn's disease:* It is characterized by inflammatory granulomas present over entire length of GI tract, these lesions can progress to buccal space abscess—Ruled out.
4. *Traumatic cheek bite:* Linea alba along line of occlusion was not found—Ruled out.

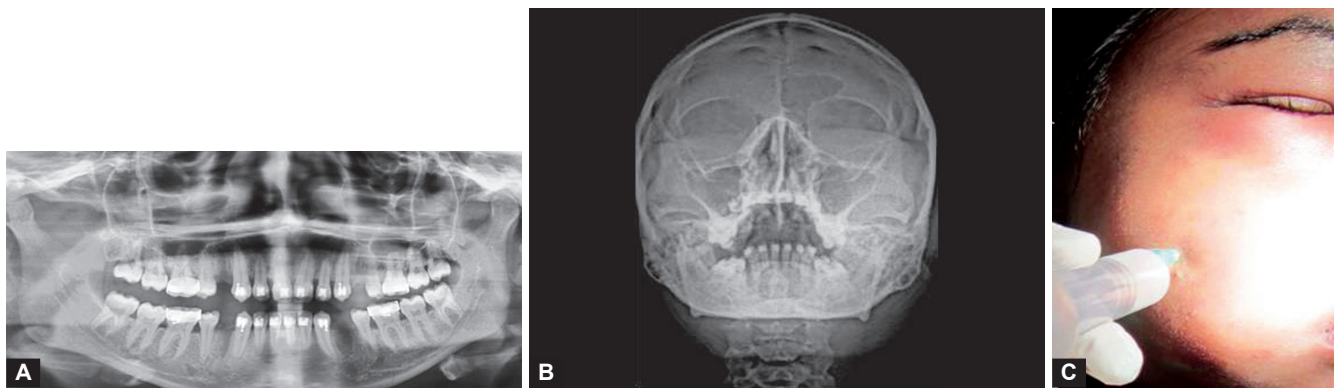
#### Investigations Advised

1. *Radiographs:* PNS view: The PNS view shows no bony involvement
2. *Aspiration:* FNAC: The FNAC report showed many poly morphonuclear neutrophils suggestive of acute infection.

**Diagnosis:** Buccal space infection secondary to trauma from the maxillary molar tubes of the fixed orthodontic appliance.

**Treatment plan:** The intra oral appliance was removed and patient was sent for medical treatment to the attached medical hospital. She was hospitalized and given intravenous third generation cephalosporins along with metronidazole.

**Procedure in detail:** Under local anaesthesia, an incision was given in the buccal sulcus just below the laceration. Sinus forceps was used to dilate the locules and evacuation of pus followed by the placement of corrugated drain. The active treatment was given for 2-3 days followed by resting period of one week. Her post treatment results were satisfactory (Figs 4A and B).



**Figs 3A to C:** (A) Inspiration of the fluid from the swelling area (B and C) radiographic images showing no bony involvement



**Figs 4A to B:** (A) Posttreatment extraoral view and (B) posttreatment intraoral view

## DISCUSSION

Traumatic wounds carry with them a higher degree of contamination because the mechanical protective features of the skin and mucous membrane are disrupted, which allows direct invasion of micro-organisms into the deeper tissues. The internal systemic biologic mechanisms of the host defence are also compromised by the effects of the trauma. For example, with a major trauma there is a decrease in cellular immune functions, intracellular killing, and endothelial system function.<sup>4,5</sup> If traumatic shock develops, there is also a decrease in systemic perfusion, which in the presence of local tissue damage, may reduce the blood flow to the wounded area and further compromise containment of the bacteria.<sup>6,7</sup>

Studies on management of traumatic wounds have shown that the rate of infection ranges between 2.5% and 11.5%.<sup>8</sup> This rate is influenced by several variables, which are often referred to as risk factors. Some of these factors are related to the host, the environment and the type of the wound, where as the others are related to the techniques used to manage the wounds.<sup>9</sup> The cytokines also may result in the release of growth factors that stimulate fibrosis and result in localized scar hypertrophy.<sup>10</sup> Once the signs and symptoms of wound infection become clinically evident, the goals of treatment should be to optimize tissue perfusion and nutrition, remove the devitalized tissue, prevent further

spread of the infection or further tissue destruction, and achieve wound closure.<sup>11</sup>

To achieve these goals, Fildes et al, described a unified approach to the treatment of post-traumatic soft tissue infections.<sup>12</sup>

- Phase I: Early recognition
- Phase II: Empiric antibiotics
- Phase III: Debridement
- Phase IV: Wound closure

## CONCLUSION

Fixed orthodontic appliances can cause soft tissue problems which in turn could be life threatening, therefore knowledge of head and neck facial space anatomy is essential in diagnosing and managing these infections at the earliest.

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