

Submental Abscess that Extend to Bilateral Submandibular Region after Treatment of Symphysis Mandible Fracture: A Case Report

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Abstract: ***Background:** Abscess is an acute localized infection with inflammation, swelling, tenderness on palpation or local tissue damage and can occur at any age. One of the orofacial abscess rare causes is open mandibular fracture or infected trauma. **Objectives:** To evaluate the management of post treatment mandibular fractures in preventing infection or abscess and to describe the pathophysiology of a traumatic abscess. **Case Report and Management:** A 21 year old male patient came with swelling in the lower jaw with difficulty in swallowing. A month before admission, the patient had an accident and symphysis of mandible was fractured. In emergency room, he received interdental wiring treatment, but due to poor oral hygiene which caused by uncooperative behavior in maintaining oral hygiene, the fracture became infected and an abscess occurred. The abscess was surgical drained extraorally and mounted with through and through penrose drain at submental and bilateral submandible region. **Conclusion:** Trauma of mandible fracture is a rare cause of an abscess in the orofacial region. The situation becomes worse if the area of the mandibular fractures is infected. Post-traumatic care is required to prevent the occurrence of the abscess. Pathophysiology of the case is described in a short discussion on the pathophysiology of abscess due to infected mandibular fracture.*

Keywords: mandibular fracture, infection, pathophysiology, post-traumatic care

1. Introduction

In dentistry, one of the most difficult problem to manage is an orofacial infection. Infection is defined as the detrimental colonization of a host organism by a foreign microorganism, and inflammation is the term describing the host response to stimuli including those of infection.^{1,5} one of the causes that are uncommon in orofacial infections are open mandibular fracture and infected trauma. These infections may range from low-grade, well localized infections that require only minimal treatment to severe, life threatening deep facial space infections.^{1,3,4} The cardinal causes of orofacial infections are non-vital teeth, pericoronitis (due to a semi-impacted mandibular tooth), tooth extractions, periapical granulomas that cannot be treated, and infected cysts. Rarer causes include post operative trauma, defects due to fracture, salivary gland or lymph node lesions and infection as a result of local anesthesia.²

The mandible is the second most commonly fractured part of the maxillofacial skeleton because of its position and prominence. In the management of any bone fracture, the goals of treatment are to restore proper function by ensuring

union of the fractured segments and reestablishing preinjury strength, to restore any contour defect that might arise as a result of injury, and to prevent infection at the fracture site.^{1,3} In this case, where the fracture of the symphysis mandible was comminuted, the risk of being infected was higher. The treatment of comminuted mandibular fractures merits special consideration because these fractures are technically more difficult to repair and are associated with a higher rate of complications. The purpose of this study was to evaluate the management of post traumatic mandibular fractures to prevent infection or abscess and to describe the pathophysiology of an abscess from trauma.

2. Case Report

A 21 year old male patient with no past history of major illness came to Hasan Sadikin Hospital Bandung with swelling in the lower jaw followed by difficult of swallowing and tenderness. A month before admission, the patient had an accident and got fractured at his symphysis of mandible, dentolaveolar fracture of teeth 32-42 with i avulsion of tooth 32 and mobility grade 3 of teeth 31-42. (Fig. 1).

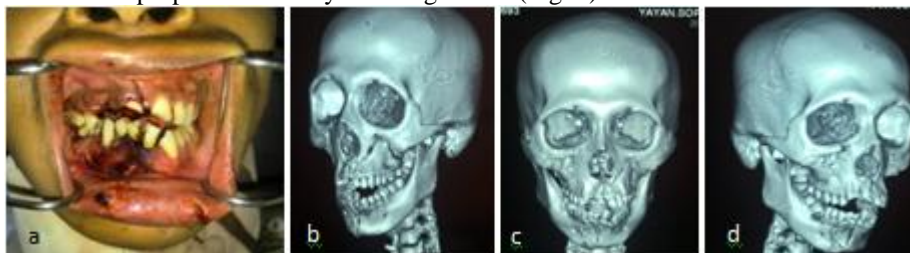


Figure 1: Clinical picture of comminuted symphysis mandible fracture, dentolaveolar fracture of teeth 32-42 with avulsion of tooth 32 and mobility grade 3 of teeth 31-42. (a) 3D CT Scan radiograph showed comminuted symphysis mandible fracture, dentolaveolar fracture of teeth 32-42. (b,c,d)

Volume 8 Issue 2, February 2019

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In emergency, he received interdental wiring treatment at upper and lower jaw, and the patient was hospitalized about four days. (Fig. 2), but due to poor oral hygiene which caused by uncooperative in maintaining his oral hygiene according to instruction that given by the operator when discharged, the fracture became infected and was being an abscess since 5 days ago. (Fig. 3).



Figure 2: Post interdental wiring treatment at upper and lower jaw in emergency room



Figure 3: Clinical pictures of submentale abscess with swelling and tenderness in the lower jaw. (a,b) and clinical picture of poor oral hygiene (c)

On physical examination, the patient having SpO₂ 98% with temperature of 37,1 °C, heart rate of 85 bpm, respiration of 20 bpm and blood pressure of 110/70 mmHg. Emergency x ray of the neck showed a collection of abscess in the submandibular region as high as C2-3, and did not showed any widened of retropharyngeal and retrolaryngeal space (Fig. 4) . From panoramic x ray showed there was neglected fracture of symphysis mandible (Fig. 5). His laboratory findings included a white blood cell (WBC) count of 16.900/mm³. Examination on chest, abdominal and cardiovascular system did not reveal any clinical abnormality.



Figure 4: Soft tissue neck AP Lateral x ray showed there was fluid collection at submentale region as high as C2-3 (a), and there was no widening at retrofaringeal dan retrolaryngeal space (b)

For the abscess, the patient was performed with surgical incision and drainage extraorally, which ±20 cc of pus was drained from the submentale and bilateral submandible region, and then mounted with through and through penrose drain (Fig. 6).



Figure 5: Tapping pus formicrobiological and sensitivity culture check (a),incision and drainage extra orally at submentale and bilateral submandibularregion (b)

Ceftriaxone injection (2x1 gr/day) and metronidazole infusion (3x500 mg/day) were administered for 5 days after the first hospital visit. The microbiological culture of the tapping pus showed *Streptococcus viridians* sensitive to Erythromycin and Levofloxacin.(Fig.5.a)

On the first day of post-operation, the patient did well with improvements in his condition. He was discharged on the forth day after operation in a good condition without developing any complications. He was then planned with Open Reduction Internal Fixation in the next 2 weeks.



Figure 6: Penrose drain through and through at submentale and bilateral submandibular region

3. Discussion

Infection represents the most commonly encountered complication of jaw fractures.^{1,4,5,7}Pre-surgical and post surgical contamination of the fractured site, and hence the incidence of infection, is greatly influenced by the patient dental condition and oral hygiene. Oral hygiene is greatly influenced by patient compliance, which would affect the treatment type to be used.Rigid fixation requires adequate postoperative care to prevent postoperative complication especially infection, which cannot be guaranteed in noncompliant patient.⁸ Zacharias dkk et all reported that comminution , gross displacement, and compound fractures are all factors that can contribute to the development of infection in mandibular fractures. Virulence and

microorganism, host resistance are the most important patient-related factors linked to the development of infection. However, many other factors have been considered. Aging is suggested to be a potential risk factor for postoperative infection. The immature immune system of children may contribute to the decreased resistance to infection.⁸ Therefore, the ideal handling of teeth in fracture lines has always been a controversial issue.⁸ In the past, teeth in the line of fracture were always removed. Their removal was advocated because fractures of the dentate portion of the jaws are compound via the periodontal ligament and it was believed that this communication fostered infection, osteomyelitis and nonunion.^{4,6,8} However, Neal and colleagues, Kahnberg and Ridell, Schneider and Stern, and Amarungga have all been show that the majority of teeth in the fracture line can be saved if appropriate antibiotic therapy and fixation techniques are used.³ The possibility to depressed an infection by the use of antibiotic drugs has made the prophylactic extractions of teeth situated in the fracture line unnecessary. Teeth involved in the fracture line may often be of great value in repositioning of the fracture.^{4,6,7,8,10} Those are become the consideration factors for emergency room operator to treat the mandibular fracture case, with maintaining the teeth on its fracture line by using interdental wiring fixation.

Oral hygiene is a key factor to eliminate and prevent post operative infection.⁸ The post treatment care manajement must done by the patient to reach. The long term rehabilitation goals and the functional recovery. The patient condition need to be evaluated regularly and instructed to eat proper and balance diet. The patient also suggested to keep the teeth and oral hygiene to faster the healing process.^{3,4,9} In this case we found that the oral hygiene of the patient in emergency room was very poor. He acknowledged that since being treated with interdental wiring he never brushed his teeth. In this case, either the bad oral hygiene caused by patient bad complienced on post treatment instruction, the comminuted type of mandibular fracture and the absence of teeth at the fracture line can also cause the infection.

The bacteria invade through teeth periodontal ligament which present on fracture line and direct exposed to the fracture fragment, and continue to invade the bone tissue. In the bone tissue, the bacteria infection invade through the low resistance area, and cross the cortical plate of processus alveolaris then spreading to other spaces. If the infection conclude the soft tissue, this condition can cause diffuse inflammatory response like selulitis and abscess formation.^{1,3,4}

The management of trauma infection site is by incision and drainage, and administered of antibiotics.^{1,3,4,5,9} The important principal of drainage incision by blunt dissection to the source of the infection and and mounted with drain to where the pus most collected. Penrose drain pinched by hemostat then pushed in the others incision.⁸ Sometimes more than adequate drainage are needed to decompressed the infection area.^{1,3,5}

4. Conclusion

Orofacial infections can be the most challenging cases that an oral and maxillofacial surgeon will be called on to treat. One of the orofacial abscess rare causes is open mandibular fracture or infected trauma. The incidence of infection in this case, is greatly influenced by the patient dental condition and oral hygiene and are influenced by patient compliance, type of fractures that comminutive and teeth involvement in the fracture line. Post traumatic care is required to prevent infection. And management of abscesses in these cases is surgical drainage with the placement of through and through penrose drain.

5. Acknowledgement

The author would like to acknowledge the significant contribution from Dr. drg. Endang Sjamsudin., Sp.BM, drg. Winarno Priyanto., Sp.BM and for those who helped a lot in finalizing this case report within the limited time frame.

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