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(CASE REPORT)

Impacted tooth at the mandibular angle fracture line: Retained or remove?

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Abstract

Background: Management of mandibular fractures is usually associated with teeth at the fracture line. The involvement of impacted teeth in mandibular angle fractures is a consideration for the surgeon to retain or extract them.

Purpose: This case report aims to discuss the necessity to retain or remove an impacted tooth in the mandibular angle fracture line.

Case: A 23-year-old woman came to the emergency installation with complaints of lumpy bite and pain due to falling from the motorbike with his chin hitting the asphalt. Discontinuity was found in the mandibular border of the right angle and left parasymphysis regions. Tooth 48 is impacted and is in the fracture line of the mandibular angle region. The diagnosis of mandibular segmental fractures in the right mandibular angulus region and left mandibular parasymphysis and total impaction of 48 class II position B (Pell & Gregory) were established.

Case management: Open reduction internal fixation (ORIF) plating on right mandibular angulus and left mandibular parasymphysis was performed with the use of inter maxillary fixation with rubber ligature. Odontectomy of the impacted tooth involved in the fracture line was also done.

Conclusion: The impacted tooth at the fracture line was removed in order to facilitate repositioning and fixation of the mandibular angle and with the consideration of delayed healing which may increase the chance of infection.

Keywords: Angle of the mandible; Fracture line; Impacted tooth; ORIF plating

1. Introduction

The mandible is the most frequently injured facial bone and is prone to fractures because of its relatively prominent position. Nearly half of mandibular fractures occur in the tooth bearing area. Managing teeth along the line of fracture is a common challenge in the management of mandibular fractures. Injuries to the mandibular angle are frequently associated to impacted wisdom teeth. When wisdom teeth are impacted, the quantities and stability of bone in this area are frequently reduced. However, erupted teeth in the fracture line may be involved in any fracture involving the dentate area of the jaw. Through the periodontal space, the fracture line and affected teeth communicate with the oral cavity, which may help the infection spread. Another theory is that trauma to these teeth could disrupt their blood flow, resulting in pulp necrosis and infection [1,2].

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The mandibular third molar along the line of fracture frequently makes treating mandibular angle fractures more complicated. Avulsion, subluxation, root fracture, or exposure of the root surface are all possible causes of injury to the tooth involved in the fracture line. The tooth involved may already have pulpal, periodontal, or periapical pathology, or it may sustain damage that renders it non-vital [3].

Infection is a frequent complication of mandibular angle fractures with impacted teeth. If treatment is not received, the infection may worsen in angle fractures with infected teeth. Tooth mobility, periapical and periodontal disease, root fracture, and partially erupted teeth are indicators of impacted teeth that should be extracted [4,5].

Such fractures require extra care to prevent complicated or delayed bone healing. To avoid potential sepsis, some surgeons advise extracting the teeth that are in the fracture line. Clinicians have argued about the preservation of the tooth at the fracture line due to infection, which is the most feared treatment-related complication, and the controversy surrounding an unerupted tooth in the fracture line and its effects on bone healing [5,6].

2. Case Report

A 23-year-old female patient came to the emergency installation with the main complaint of lumpy bite accompanied by pain. Yesterday, the patient fell from a motorcycle with the chin hitting the asphalt first. At the time of the incident, the patient was not wearing a full-face helmet. The patient did not remember the incident. The patient also complained nausea, vomiting, and difficulty in eating. She only drinks milk since the incident.

Extraoral examination showed facial asymmetry, puncture wound on philtrum region, and excoriation on facial region, nasofrontal region and mental region, accompanied by edema and hyperemia. On palpation, there were step off in the right mandibular angle region and left mandibular parasymphysis along with edema and tenderness.

On intraoral examination, the mouth opening was 2.8 cm wide. Anterior and posterior open bite was seen on the right side, the right mandibular alveolar segment was inferiorly to the left segment. Edema of the vestibular regions 41, 42, 31, 32, clot in the region 48 with hyperemia, crown fracture of 41, 21, and puncture wound in the upper lip mucose were seen. 2nd degree of tooth mobility was found on 41, 42, 31, 32, accompanied by pain.

Figure 1 Preoperative intra oral clinical picutre

On panoramic and skull AP radiolograph examination found radiolucency on the right angle and left parasymphysis region with the impression of a fracture line. Discontinuity was seen in the mandibular border of the right angle and left parasymphysis regions. The tooth 48 is impacted and is in the fracture line of the mandibular angle region. Based on the examination, the diagnosis of mandibular segmental fractures in the right mandibular angulus region and left mandibular parasymphysis and total impaction of 48 class II position B (Pell & Gregory) were established.

Figure 2 Preoperative radiograph (a) panoramic; (b) skull AP

3. Case Management

Treatment included open reduction internal fixation (ORIF) plating on the right mandibular angle and left mandibular parasymphisis along with intermaxillary fixation (IMF) with rubber ligature and odontectomy of 48 under general anesthesia. Post-surgery evaluation was carried out on the first day after ORIF surgery.

Periodic follow ups were done to evaluate the results of the surgery by panoramic photos, clinical photos and laboratory examinations. At the two months follow-up, panoramic examination showed a callus formation.

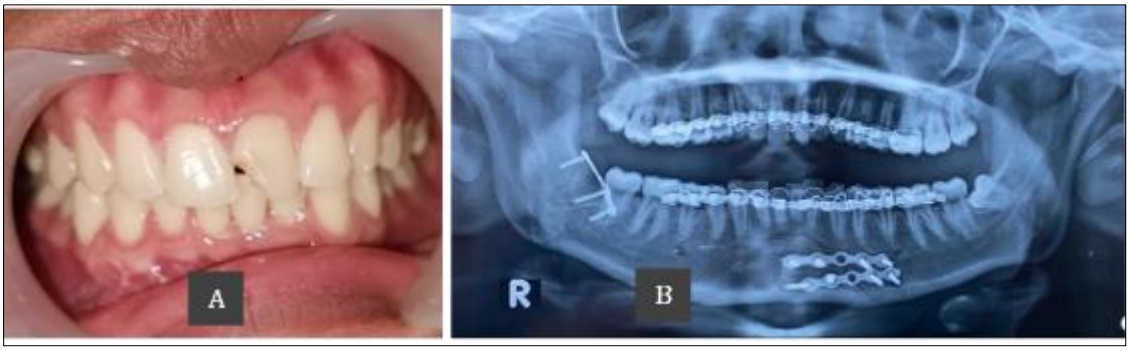

Figure 3 Post-operative (a) intraoral, three months follow-up; (b) panoramic, two months follow-up

4. Discussion

The general guidelines for treating bone fractures should always be kept in mind when treating for individuals who have experienced maxillofacial trauma. The proper fixation technique, which will hold the bone fragments immobilised in a functional position while maintaining occlusion until the end of the treatment, the proper anatomical reduction of bone fragments, the protection of the occlusal plane, and infection prevention are these principles. The main complication is the possibility of infection, even though a tooth in the fracture line improves stability between bone fragments and makes it easier for these pieces to be reduced. The surface area between bone fragments is further reduced and the immobilisation of the bone fragments is made more difficult when teeth are extracted from the angular region where the jaw is anatomically thinner [7].

Third molars increase the risk of mandibular angle fractures in impacted Pell & Gregory class II or III and position B. The most frequent cause of mandibular angle fractures with impaired third molars is traffic accidents. Additionally, it was shown that the age group with the highest frequency of these fractures is young adults [4]. Those are consistent with the case we handled.

Teeth in the fracture line have been linked to higher risks of complications. It has been suggested that preventative tooth extraction can lessen issues like non-union or infection. According to recent studies, this occurrence is caused by the use of semi-rigid fixation techniques in fracture treatment, delayed medical attention, and the limited use of

antibacterial medicines. The kind, mode of administration, dosage, and length of antibiotic treatment are still up for discussion, despite the potential benefits of using them. The use of antibiotics may not be as significant as other aspects, such as proper reduction and fixation, timing of fixation, and dental hygiene [8].

There is currently controversy on whether to remove or keep intact wisdom teeth that are located in the fracture line. Regarding whether wisdom teeth should be extracted or left in place, there is conflicting evidence. According to some research, keeping an impacted tooth in the fracture line stabilises the fracture segments, which aids in decreasing fractures and promoting bone healing. Pericoronal or periodontal infection, cross caries, extensive periapical lesions, mobility, or exposure of the apical half or more of the root fracture are the indications for surgically removing the third molars in the line of fracture because extraction of the tooth increases the risk of contamination through the empty alveolus [9,10].

Studies have indicated that due to the higher risk of issues associated with keeping teeth in the mandibular angle fracture line, the teeth concerned should be removed. When a third molar is absent from the mandibular angle fracture line (either excised during fracture treatment or missing preoperatively), the post-operative infection risk is lower than in angle fractures where a third molar is present. It has been discovered that if the third molars in the line of a fracture are extracted at the time of fixation, have cavities, are fractured, exhibit symptoms of pericoronitis, are periodontally involved, or interfere with the occlusion, the likelihood of problems is increased [11].

Another study disputes the assertion of retaining the impacted tooth by pointing out that the third molar is a removable tooth and that leaving it in the fracture line could allow pathogenic microbes to colonise it, which would impair the prognosis following surgery. Furthermore, while the fracture line itself supports the removal process, cautiously extracting the third molar does not encourage the movement of the fracture segments. To ensure proper bone repair in the event of postoperative difficulties, keeping the third molar in the angle fracture line may necessitate a second surgical treatment to remove the tooth and the fixation plate [12].

Treatment outcomes may be determined by the patient's socioeconomic position, nutritional status, dental hygiene, abusive behaviours, and other factors. It has been demonstrated that, in comparison to closed reduction, open reduction treatments result in a greater loss of vitality of the tooth in the fracture line. Many teeth in the line of fractures were extracted in the preantibiotic era to eradicate possible sources of infection and to avoid the devastation caused by osteomyelitis and nonunion. Despite the availability of antibiotics, surgeons continue to disagree about which teeth in the line of fracture should be extracted [1,13].

In this case, ORIF plating treatment was carried out on the parasymphysis and mandibular angle regions with the extraction of impacted right third molars, the tooth was extracted with the aim of facilitating the reduction of the mandibular angle, preventing infection due to the condition of the exposed tooth and the tooth not being needed for fracture stabilization.

5. Conclusion

The impacted tooth at the fracture line was removed in order to facilitate repositioning and fixation of the mandibular angle and with the consideration of delayed healing which may increase the chance of infection.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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