

## **Mandibular Angle Fracture after Third Molar Extraction: A Case Report and Review of the Literature**

**Faisal Suhaim<sup>1</sup>, Haitham Bin Turayky<sup>2</sup> and Munira AlShahrani<sup>3\*</sup>**

<sup>1</sup>Consultant, Department of Oral and Maxillofacial Surgery, King Saud Medical City, Riyadh, KSA

<sup>2</sup>Associate Consultant, Department of Oral and Maxillofacial Surgery, King Saud Medical City, Riyadh, KSA

<sup>3</sup>Teaching Assistant, Department of Oral and Maxillofacial Surgery, King Khalid University, Abha, KSA

**\*Corresponding Author:** Munira AlShahrani, Teaching Assistant, Department of Oral and Maxillofacial Surgery, King Khalid University, Abha, KSA.

**Received:** July 17, 2020; **Published:** July 27, 2020

### **Abstract**

The extraction of third molar teeth is one of the most common procedures in the specialty of oral and maxillofacial surgery. On some occasions, the extraction results in complications, including less serious ones, such as infection, alveolar osteitis, bleeding and hemorrhage, and paresthesia. In some cases, fracture of the mandible can be observed and is classified as a severe form of these complications.

The following case present a fracture of the angle of the mandible as a complication of the extraction of the lower wisdom tooth.

**Keywords:** *Third Molar; Mandible; Complication; Fracture; Angle Fracture*

### **Abbreviation**

OPG: Orthopantomogram

### **Introduction**

Removal of impacted mandibular third molars is a well-known procedure. There are many reasons for extracting these teeth, including acute or chronic pericoronitis, the presence of a cyst or tumor, periodontal diseases, caries lesions, or in cases of orthodontic or prosthodontic treatment [1].

The management of deep impacted mandibular wisdom teeth has some degree of difficulty, and in such cases where complications can occur, the surgeon should weigh the benefits and risks of the removal of these teeth [2,3].

Common complications of the extraction of mandibular third molars include alveolar osteitis, secondary infection, nerve dysfunction, and hemorrhage. Such complications were reported to occur at a rate of 0.2% to 6% [9,10]. On the other hand, the most severe form of these complications is mandibular fracture. Iatrogenic fracture of the mandible can happen in two ways, either during the procedure, or after the extraction. It is a rare consequence, and its reported incidence ranges from 0.0034% to 0.0075% [4,6].

### Case Report

A 45-year-old female presented to the clinic of Oral and Maxillofacial Surgery at King Saud Medical City with chief complaints of moderate pain and limited mouth opening along with numbness on the left side of her lower lip over the last 21 days.

Her medical history was not significant. On examination, there was an extra oral swelling over the left side of the mandible, mouth opening was limited to about 1.5 cm, and there was a numbness level “A” discrepancy in the area of the left lower lip. For the last couple of weeks, she had difficulties during eating and could only tolerate a soft and liquid diet. An Orthopantomogram (OPG) was taken immediately and incidentally, it revealed a fracture line in the mandible angle area and the remaining root of tooth 38 (Figure 1A and 1B). After taking a full history, it was informed that she had undergone extraction of her left mandibular third molar in a private clinic 21 days earlier. During the extraction, the prosthetic crown of tooth 37 fractured, but there was no postoperative follow-up nor x-ray was obtained. On the fifth day after the extraction, she reported moderate pain (5/10). She went to the emergency room and received intravenous antibiotics, but three days later, the pain became worse. She was seen by a primary physician and was reassured after a discussion that it is quite a common complication to have pain after an extraction; no OPG was taken. She was only prescribed 400 mg of ibuprofen three times a day and one gram of Augmentin every eight hours for five days.

From our side, the patient was informed about the fracture, and a Cone Beam Computed Tomography scan was taken for further information. After a long discussion with the patient about the treatment modalities, starting from no treatment (conservative) to closed reduction and ending up with open reduction and internal fixation (ORIF), the best option was chosen to perform an ORIF by using mini-plates due to the remaining root and the nonhealing fracture.

The surgery was performed under general anesthesia. Eight Intermaxillary Fixation (IMF) screws were used (four in each jaw), and then the fracture site was exposed using a full thickness mucoperiosteal flap starting from the mesial side of tooth 36 up to the ascending

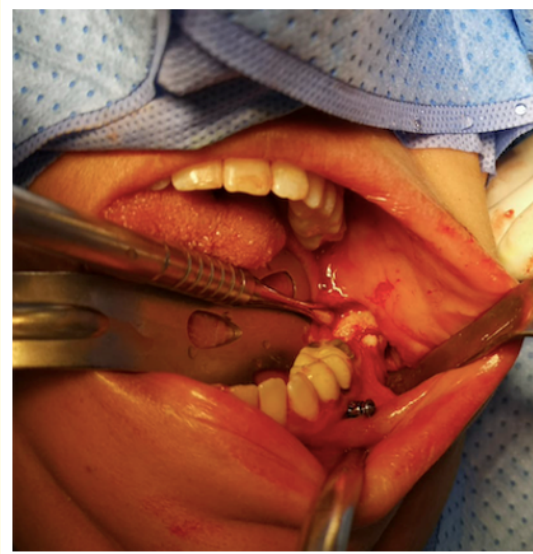


**Figure 1A:** The OPG before the extraction showing the tooth 38 with three roots.



**Figure 1B:** OPG showing the remaining root of tooth 38 and the fracture line.

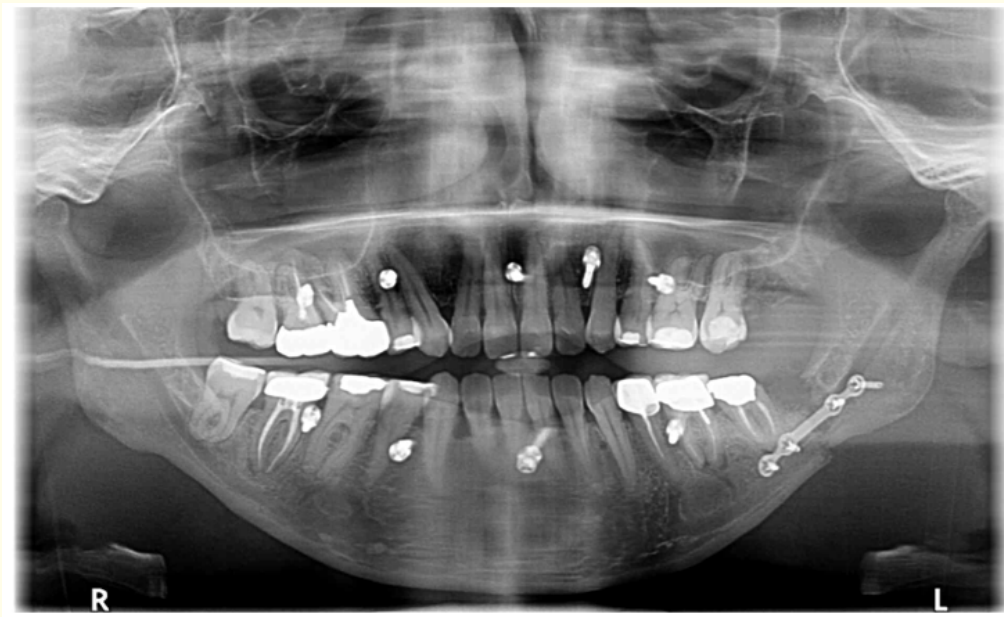
ramus. The remaining root was seen clearly through the socket and was removed (Figure 2). After that, occlusion was achieved, and maxillomandibular fixation (MMF) was completed using 24 wires. The reduction was performed using a straight titanium 2.0 mm miniplate with four holes. Two screws were placed, first at the mesial end of the plate after creating holes in a buccal-lingual direction. Then, two distal holes were created, and the reduction was successfully achieved following the Champy technique (Figure 3). The patient was then placed on MMF wires for two weeks and instructed to be on a clear liquid diet. The follow-up protocol was after one week, then two weeks, and then four weeks. On the second appointment, the MMF wires were released, and the patient was placed on MMF elastics (Figure 4). During her third follow-up appointment, the IMF screws were removed, occlusion was achieved, and she was instructed to maintain good oral hygiene and eat a soft diet.



**Figure 2:** Remaining root of tooth 38.



**Figure 3:** Fracture line reduction after placement of the plate.



**Figure 4:** Postoperative OPG.

### Discussion

The mandible can be fractured as a result of third molar extraction. It is considered a complication that should be explained to the patient, and a written consent form should be obtained before attempting the procedure. Fracture of the mandible is a rare but serious consequence after the removal of an impacted third molar, with an incidence that has been reported to be 0.0049% [4]. A retrospective study done by Alling, *et al.* [5] showed lower rates of one case out of 30,583 patients with an intraoperative mandibular fracture and one case out of 23,714 postoperatively. Nyul reported one fracture in a total of 29,000 cases [6].

Increased age, atrophic mandible, presence of tumors or cysts, and osteoporosis are all considered to be predisposing factors. The angle of the mandible has lower resistance to fracture due to its thin cross-sectional dimension. Another retrospective study was conducted by Iizuka, *et al.* to evaluate the clinical and radiographic data of 12 patients with 13 mandibular fractures after the removal of wisdom teeth. Increased risk of fracture was found in older patients (older than 30 to 40 years) with roots that were superimposed in the mandibular canal on the panoramic assessment. They found a few immediate cases of fracture, and eight late fractures occurred in an average of six days after surgery due to masticatory forces [7].

A study by Libersa, *et al.* which evaluated 37 fractures from 750,000 extraction cases, found 17 intraoperative fractures and 10 late fractures. Eight fractures occurred in men and six fractures occurred during mastication. The majority of the late fractures happened between 13 and 21 days after surgery, and they claim the cause of that is increasing masticatory function and occlusal forces, which interferes with bone healing [4].

Krimmel and Reinert conducted a retrospective study of six cases of mandibular fracture after third molar extraction and found that these fractures occurred five to 28 days (mean, 14 days) after removal. The patients were between 42 and 50 years old, and all had full dentition. In two cases, the teeth were Class B in the Pell and Gregory classification. They concluded that full dentition and advanced age are the major risk factors for this complication [8]. If a mandible fracture occurs after an extraction, specifically in the angle area, it should be treated. There are a number of treatments for mandibular angle fractures, starting from placement of a miniplate on the superior border, to miniplates on the superior and inferior borders, a compression plate on the inferior border, a reconstruction plate along the inferior border, and a lag screw [3]. For this particular case, ORIF was necessary as it fit the criteria for ORIF as mentioned by Fonseca, which includes a displaced unfavorable fracture where the proximal segment is superiorly or medially displaced, and the reduction cannot be achieved with intraosseous wires, screws, or plating. When there is a delay in treatment and soft tissue interposition between the fracture segments, open reduction should be used [11].

A study by Bodner, *et al.* assessed the characteristics and risk factors for this complication by reviewing and analyzing 189 cases. They found that increased age, full bony impaction of the tooth, and associated pathology are all risk factors for iatrogenic mandibular fracture after extraction. In addition, if the tooth needs surgical extraction, they advised that bone removal should be minimized, and tooth sectioning should be considered to avoid weakening of the remaining bone. The patient should be on a soft diet for four weeks after the extraction [12].

### Conclusion

Before extracting a mandibular third molar, the case should be assessed carefully, and the surgeon should consider the risk factors that can cause this kind of complication. As mentioned, these include older patients, a fully bony impacted tooth, and impaction with associated pathology. During the extraction, the surgeon has to minimize the amount of bone removal, or the tooth can be sectioned to avoid jeopardizing the remaining bony structure. It is preferable for the patient to consume a soft diet regimen for four weeks after the extraction. Informed consent should be obtained before the procedure, and it should be written in clear language that a fracture can occur at any point. Above all, an expert surgeon should do such types of extraction, and if a general practitioner does not have the required skills, the case should be referred to an oral and maxillofacial surgeon to avoid any unfavorable complications.

### **Conflict of Interest**

None.

### **Patient Permission/Consent**

Formal consent obtained from the patient.

### **Bibliography**

1. Chiapasco M., *et al.* "Side effects and complications associated with third molar surgery". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 76 (1993): 412-420.
2. Toffanin A., *et al.* "Sagittal split osteotomy in removal of impacted third molar". *Journal of Oral and Maxillofacial Surgery* 61 (2003): 638-640.
3. Ness GM., *et al.* "Peterson's principles of oral and maxillofacial surgery". London: BC Decker Inc. Hamilton (2004): 139-155.
4. Libersa P., *et al.* "Immediate and late mandibular fractures after third molar removal". *Journal of Oral and Maxillofacial Surgery* 60.2 (2002): 163-165.
5. Alling CC and Alling R. "Indications for management of impacted teeth". In: Alling C, Helfrick J, Alling R, editors. Impacted teeth. Philadelphia: WB Saunders Co (1993): 43-64.
6. Nyul L. "Kieferfracturen bei zahnextraktionen". *Zah-la" rztl Welt* (1959): 60.
7. Iizuka T., *et al.* "Mandibular fractures following third molar extraction: a retrospective clinical and radiological study". *International Journal of Oral and Maxillofacial Surgery* 26.5 (1997): 338-343.
8. Krimmel M and Reinert S. "Mandibular fracture after third molar removal". *Journal of Oral and Maxillofacial Surgery* 58.10 (2000): 1110-1112.
9. Goldberg MH., *et al.* "Complications after mandibular third molar surgery: a statistical analysis of 500 consecutive procedures in private practice". *Journal of the American Dental Association* 111.2 (1985): 277-279.
10. Osborn TP., *et al.* "A prospective study of complications related to mandibular third molar surgery". *The Journal of Maxillofacial and Oral Surgery* 43.10 (1985):767-769.
11. Fonseca RJ. *Oral and Maxillofacial Trauma* 4<sup>th</sup> Edition.
12. Bodner L., *et al.* "Characteristics of iatrogenic mandibular fractures associated with tooth removal: review and analysis of 189 cases". *British Journal of Oral and Maxillofacial Surgery* 49.7 (2011): 567-572.

**Volume 19 Issue 8 August 2020**

**©All rights reserved by Munira AlShahrani., et al.**