



CASE REPORT

# Iatrogenic Mandibular Ramus Fracture Following Surgical Removal of Impacted Third Molar

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**Abstract** Surgical removal of an impacted tooth is considered to be one of the most frequently performed minor oral surgical procedures due to the plethora of indications associated with it. Like any other surgical intervention, the surgical removal of impacted third molars is also associated with numerous complications. Lot of emphasis has been laid to prevent the complications associated with the surgical removal of impacted third molars. However, at times in spite of delivering the utmost caution, complications occur as a consequence of surgical removal of impacted third molars. We report a rare case in which iatrogenic mandibular ramus fracture occurred in an attempt to surgically removal of an impacted third molar.

**Keywords** Third molar · Mandibular fracture · Iatrogenic injury

## Introduction

Owing to the surplus indications for the surgical removal of an impacted tooth, it is considered to be the most frequently performed minor oral surgical procedure [1]. Surgical removal of deeply impacted third molar poses a significant surgical challenge to even an experienced operator. Numerous complications can occur as a consequence of surgical removal of deeply seated impacted third molars. They may manifest in the form of alveolar osteitis, secondary infection, dysesthesia, pain, hemorrhage, etc.

The incidence of such complications ranges from 0.2 to 6% [2, 3].

The incidence of iatrogenic mandibular fracture associated with the surgical removal of an impacted third molar range from 0.0034 to 0.0075% [4]. Literature reveals that the presence of an unerupted lower third molar significantly weakened the mandibular angle region [5]. Hence, iatrogenic mandibular fracture usually occurs at the mandibular angle region. We report a case of a rare mandibular ramus fracture that occurred as a consequence of surgical removal of an impacted third molar.

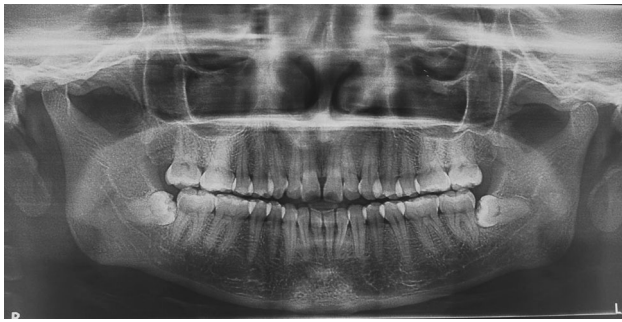
## Case Report

A 40-year-old female reported to our unit complaining of pain and difficulty in opening her mouth. She gives a history of pain in the left lower back tooth region since 2 days for which she visited a local dental clinic. Following a clinical & radiological examination, she was diagnosed with an infection in relation to her deeply impacted lower left third molar and she was advised to undergo surgical removal of her impacted lower left molar (Fig. 1). She gives a history of undergoing a surgical intervention for the same which was traumatic and is of long duration under local anesthesia by a general dentist. With great difficulty the impacted tooth was removed in multiple pieces and the patient was discharged from the OPD. In spite of the usage of medication, her pain did not subside and the mouth opening started reducing gradually.

A thorough clinical examination by us revealed that the sutures were intact at the surgical site and the healing of the soft tissue was progressing normally. There was tenderness at the retromolar region and anterior border of the ramus. A postoperative OPG was done which revealed a left

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**Fig. 1** Preoperative radiograph showing impacted left lower third molar

mandibular ramus fracture as a consequence of surgical removal of impacted third molar (Fig. 2). Patient was advised open reduction and internal fixation for the management of her mandibular ramus fracture. However, considering the physical & psychological trauma the patient underwent during the course of time in addition to the fact that the fracture was a simple and an undisplaced fracture, a conservative treatment option in the form of intermaxillary fixation (IMF) with ties and arch bars for 6 weeks was done instead of the surgical option. Patient was followed up at regular intervals and evaluated for pain and occlusal stability. IMF was removed after 6 weeks. Following the removal of IMF, an aggressive mouth opening exercises was performed and 6 months follow-up of the patient revealed a pain free adequate mouth opening with good occlusal stability.

## Discussion

Literature reveals that iatrogenic fractures may occur during a surgical procedure or within 4 weeks after the intervention [6]. Occurrence of an iatrogenic mandibular fracture during the surgical removal of the impacted third molar is very rare [7, 8]. Review of literature indicating the site of iatrogenic mandibular fracture and the type of management employed is shown in Table 1. Studies have



**Fig. 2** Postoperative radiograph showing the removal of impacted tooth that lead to iatrogenic mandibular ramus fracture

revealed that there is a risk of fracture of the mandibular angle because the presence of an unerupted third molar. [9, 10] Deeply impacted third molars occupy a large osseous space and thereby weaken the mandibular angle by decreasing the cross-sectional area of bone and causing the loss of support. Studies have shown that iatrogenic mandibular fractures occur mostly during the surgical removal of an erupted vertically impacted third molar and unerupted mesio-angular third molar [11, 12]. Iatrogenic mandibular fracture occurring at the ramus in an attempt to remove a horizontally impacted tooth is very rare.

Iatrogenic mandibular fractures occur as a result of improper instrumentation and application of excessive force to the bone during surgical removal of third molars. Contrary to that, mandibular fractures can occur in the late postoperative phase probably due to the application of high level of biting forces during mastication or a failure in not having soft diet in the postoperative phase [13]. A study reveals that iatrogenic mandibular fractures occur predominantly on the left side compared to the right side since visualization of the right side is better and control of the forces is easier compared to the left side [14]. On the contrary, another study found no difference in the occurrence of fractures on the right and left sides [11].

The extent of tooth impaction, the volume of the impacted tooth, and the relative portion of mandibular volume are also important contributing factor for iatrogenic mandibular fractures following surgical removal of impacted third molars [11, 15]. Preexisting pathological findings at the surgical site such as pericoronitis, periodontal pockets, and cysts may also weaken the mandible [15]. In addition to this, increased age leading to reduction in the bony elasticity and patients suffering from osteoporosis are at high risk for iatrogenic mandibular fractures following surgical removal of impacted third molars. [11, 15, 16].

The operators experience is an essential element in iatrogenic injury. A recent study conducted to evaluate the perception among the medical fraternity and general public pertaining to the scope of specialty of Oral and maxillofacial surgery revealed that 80.6% of the general public and 95% of medical professionals would seek the help of a general dentist to undergo surgical removal of their impacted third molars [17]. Iatrogenic mandibular fracture occurring at the ramus in an attempt to remove a horizontally impacted tooth by a general dentist supports the above study. However, there is enough evidence in the literature to support that iatrogenic mandibular fractures can occur even in the hands of the most experienced Oral and maxillofacial surgeons [18]. This necessitates the need to plan each individual case of third molar extraction case accurately by both clinical examination radiographic evaluation to lessen the risk of complications [19].

**Table 1** Review of literature indicating the site of iatrogenic mandibular fracture following surgical removal of third molars and the type of management employed

S. no.	References	Intraoperative/late	Iatrogenic mandibular fracture following surgical removal of impacted third molars	Type of management
1.	Krimmel and Reinert [6]	Late postoperative	Mandibular angle fracture	ORIF
2.	Wagner [14]	Late postoperative	Mandibular angle fracture	ORIF + autologous iliac crest graft
3.	Woldenberg et al. [7]	Intraoperative	Mandibular angle fracture	Closed reeduction
4.	Cankaya et al. [15]	Intraoperative	Mandibular angle fracture	Closed reduction
5.	Tomruk and Arslan [13]	Late postoperative	Mandibular angle fracture	ORIF
6.	Mihmanli et al. [8]	Intraoperative	Mandibular ramus fracture	Closed reduction
7.	Silva et al. [19]	Intraoperative	Mandibular angle fracture	ORIF

In developing countries like India, this is the most common reason for most of the complications seen following surgical removal of third molars particularly the iatrogenic mandibular fractures even in healthy patients where the tooth may or may not be deeply impacted. It is a well-known fact that a duly qualified and trained operator can deliver flawless treatment with their trained and skillful hands and this awareness needs to be increased keeping the best interests of the patient which is the main purpose of this article.

## Conclusion

The ability to predict the surgical difficulty of surgical removal of impacted third molars is very critical in designing a treatment plan. An operator needs to evolve with the aid of the available current literature, sophisticated equipment's and personal experience to understand the reasons for iatrogenic mandibular fractures and prevent this complication that can occur as a consequence of surgical removal of impacted third molars.

## Compliance with Ethical Standards

**Conflict of interest** All the authors declare that they have no conflict of interest.

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