CASE SERIES

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MANDIBULAR FRACTURES ASSOCIATED WITH THIRD MOLAR ODONTECTOMY

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Abstract. Background: *Intraoperative and postoperative fractures of the mandibular angle are among the most common complications associated with surgical interventions in this region. These fractures may occur intraoperatively or postoperatively, leading to significant patient discomfort and prolonged treatment duration. The* ***aim*** *of this study is to present several cases of intraoperative and postoperative fractures occurring in the mandibular angles after third molar extractions.* ***Results:*** *We report three cases of patients who sustained postoperative mandibular angle fractures following the odontectomy of lower third molars. Factors contributing to this complication were analyzed, along with the treatment methods employed. Intraoperative and postoperative fractures are relatively rare complications. While some fractures occur during surgery, others may develop spontaneously at a later stage due to the weakened structural integrity of the mandible. Certain preventive approaches, such as prophylactic immobilization, have demonstrated positive outcomes; however, they may also increase patient discomfort.* ***Conclusion:*** *Each surgical case should be assessed individually. In cases of significantly elevated fracture risk, prophylactic immobilization may be a reasonable preventive measure.*

Key words: *mandibular fracture, odontectomy, third molar*

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INTRODUCTION

Fracture of the mandibular angle during a third molar extraction is a rare but serious complication. It may result from excessive force applied during the procedure or occur in patients with compromised bone integrity, such as those with osteoporosis, cysts, or chronic infections surrounding the third molar [1, 2]. Typically, the fracture is identified by the performing surgeon. However, in some cases, it may proceed unnoticed and only be detected later on radiographic examination, often prompted by persistent swelling [3, 4].

Specific factors contributing to fracture occurrence during third molar extraction include:

- Difficult surgical access, particularly in cases of deeply impacted third molars or those located near the mandibular angle (Fig. 1, 2).
- Chronic inflammatory processes, cysts, or tumors, which may weaken the bone structure [5, 6] (Fig. 3).
- Excessive force application during the extraction procedure [7, 8].

Intraoperative fractures of the mandible typically occur days, weeks, or even months after a third molar extraction. These fractures are often associated with jawbone weakness resulting from the extraction itself, pre-existing pathology, or an additional traumatic factor. Patients commonly report experiencing a cracking or popping sensation while chewing hard food. In rarer cases, fractures may result from minor trauma, such as falls or sports-related injuries. Subsequently, patients develop pain, swelling, bleeding from the extraction site, and difficulty in occlusion [9, 10].

The clinical symptoms of a mandibular fracture include:

- Persistent and severe pain beyond the expected post-extraction discomfort.
- Swelling and bruising in the jaw region.
- Difficulty in jaw movement or proper occlusion.
- Audible “clicking” or “cracking” sounds while eating.
- Altered jaw anatomy, which may be detected upon palpation.
- In some cases, paresthesia of the lower lip due to the involvement of the inferior alveolar nerve [11, 12].

Diagnosis is based on a patient history, including an analysis of events during or after the extraction of

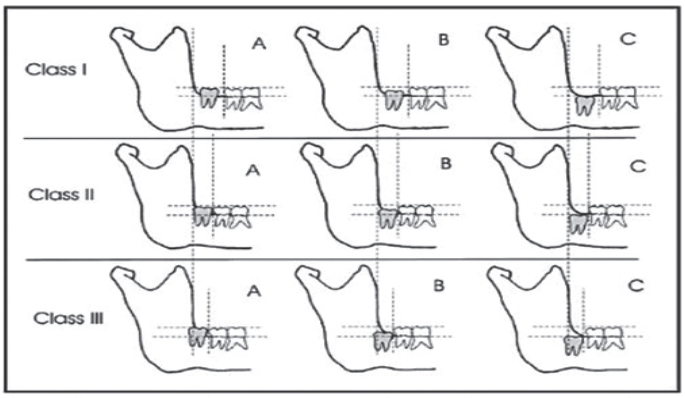

Fig. 1. Pell-Gregory classification of 3rd molar impactions [2]

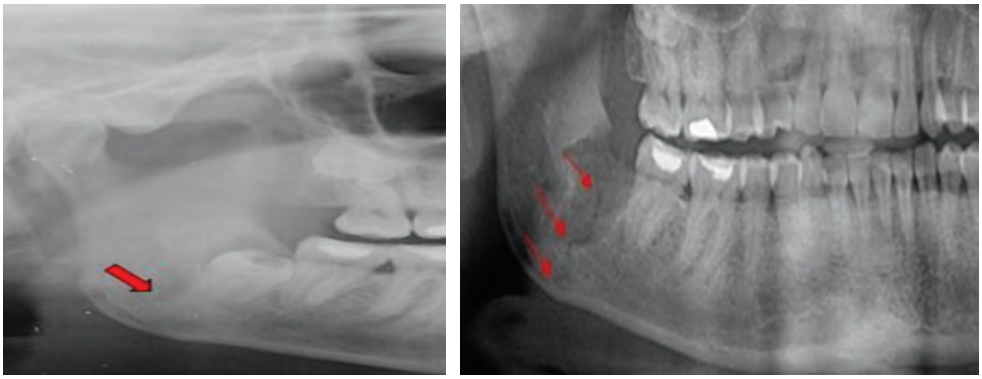

Fig. 2. Class III B, according to Pell-Gregory [7]

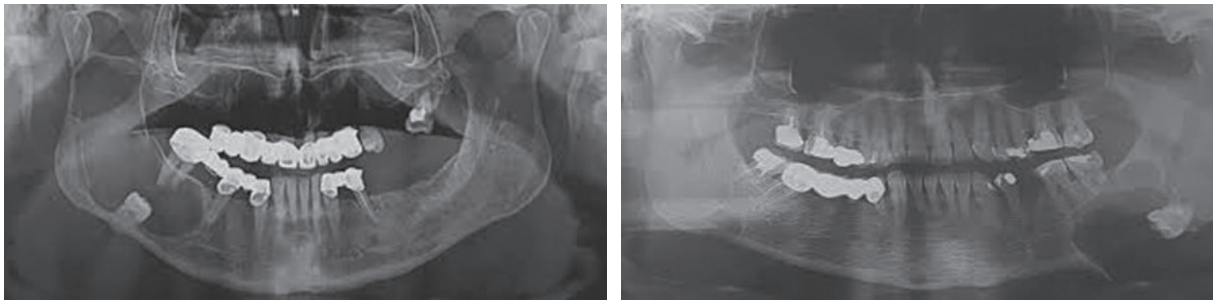

Fig. 3. Cysts, or tumors, which may weaken the bone structure [4]

the mandibular third molar. Clinical examination may reveal anatomical irregularities, abnormal mobility, and bony crepitus. Imaging techniques such as panoramic radiography and computed tomography (CT) are commonly used for confirmation [13, 14] (Fig. 4).

Management typically involves immobilization using intermaxillary fixation (IMF) with dental splints or mini-screws. In cases of significant displacement or defects resulting from an underlying pathological process, osteosynthesis with mini-plates is required. In rare cases, mandibular reconstruction may be necessary [15, 16].

The prevention of intraoperative and postoperative mandibular fractures requires:

- Thorough analysis of imaging studies prior to surgery.
- Detailed surgical planning to minimize bone trauma.
- Monitoring of the healing process and postoperative care.
- Strict patient compliance with post-extraction instructions [17, 18].

Aim: To present cases of intraoperative and postoperative mandibular angle fractures, analyze the underlying causes, and explore possible preventive measures.

CASE REPORT 1

A 67-year-old male patient was admitted to the Department of Oral and Maxillofacial Surgery at the "Sv. Pantaleon" University Hospital, Plovdiv, due to complaints of pain in the left half of the mandible.

Clinical Examination and Diagnosis

Upon the examination, a vertically impacted lower left third molar with a destroyed crown and chronic pericoronitis was identified.

Surgical Procedure

An odontectomy was performed, revealing a high degree of ankylosis, necessitating osteotomy at the root level.

Postoperative Course

The patient was discharged following a normal postoperative period. Subsequent follow-up examinations revealed no complications or subjective complaints (Fig. 5).

Postoperative Complication and Management

One month later, the patient returned to the department with complaints of swelling in the left cheek. Clinical examination revealed a submasseteric abscess accompanied by slight discharge from the extraction site.

Intervention

Under basal anesthesia of the lower jaw, an incision and drainage of the abscess were performed.

Outcome

Over the following days, the swelling gradually subsided, and the patient's condition improved (Fig. 6).

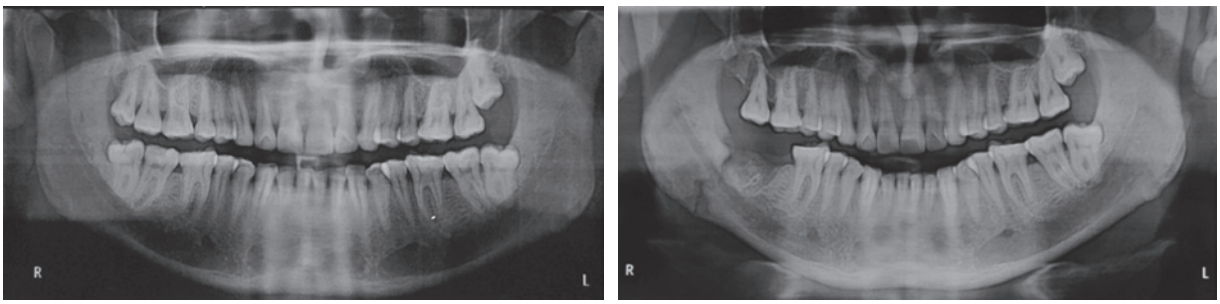

Fig. 4. Panoramic radiograph before and after fracturing [13]

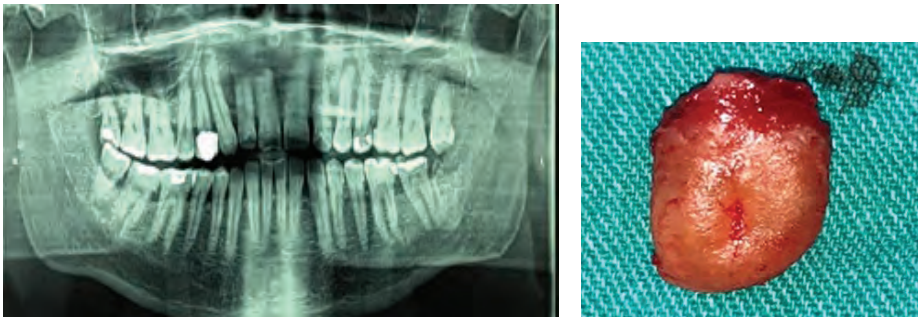

Fig. 5. Preoperative panoramic radiograph and photograph of lower wisdom tooth separation

Fig. 6. Edema appeared, one month after extraction

Diagnosis and Management of Postoperative Mandibular Fracture

Over time, a firm infiltration was detected in the region of the mandibular angle, prompting a panoramic radiograph (orthopantomograph, OPG), which revealed a fracture of the mandibular angle with signs of ossification. Clinical examination showed no crepitus or pathological mobility.

Treatment Approach

To stabilize the fracture, circumdental ligatures were placed on the upper and lower premolars and molars, followed by intermaxillary fixation (IMF) and immobilization for three weeks.

Retrospective Patient History

During one of the follow-up visits, the patient recalled that two to three weeks after the third molar extraction, he had heard a "crunching" sound while eating hard food, which he initially attributed to a solid particle between his teeth. This sound was likely the moment of mandibular fracture, which remained undiagnosed for the first month due to the absence of significant pathological signs (Fig. 7).

Final Management Decision

Given the absence of fragment displacement, a decision was made to proceed with intermaxillary fixation and immobilization for 28 days using hand-bent arch bars (Fig. 8).

CASE REPORT 2

A 69-year-old male patient was admitted for a planned surgical procedure to remove a follicular cyst associated with a lower left impacted third molar. The surgery proceeded without complications.

Postoperative Complication

Three weeks postoperatively, while eating pizza, the patient heard a cracking sound and subsequently developed pain and swelling. A pathological fracture was identified in the region of the surgical site (Fig. 9).

Treatment

The fracture was managed through IMF using segmental splints for a duration of 20 days.

Fig. 7. Non-displaced fracture

Fig. 8. Intermaxillary fixation

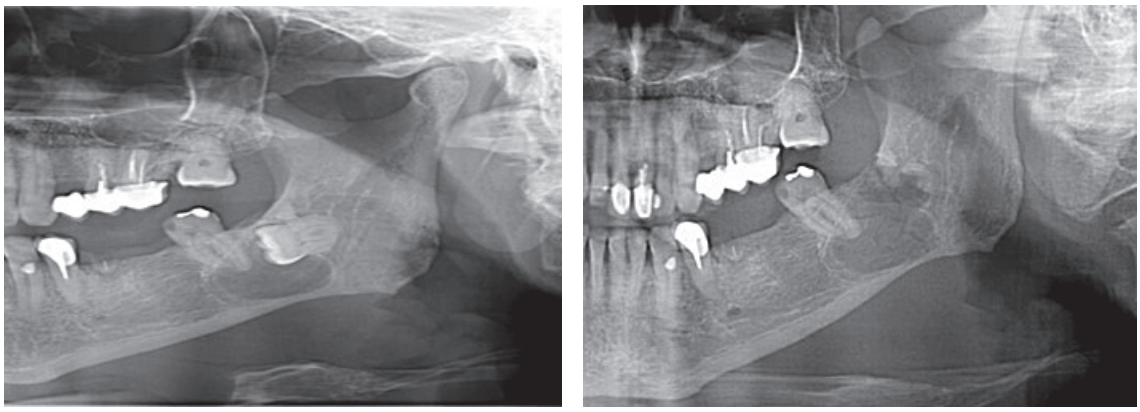

Fig. 9. Follicular cyst of the mandibular wisdom tooth and late postoperative fracture

CASE REPORT 3

A 25-year-old male patient underwent a planned extraction of an impacted lower left third molar. No flap was raised, and there was no osteotomy or segmentation of the tooth performed. During the procedure, a cracking sound was heard.

Postoperative Complication

A few days later, the patient developed severe pain, swelling, and numbness of the lower lip. Follow-up radiographs revealed a fracture at the site of the extraction.

Treatment

Temporary wire splints were placed, and plate osteosynthesis was performed to stabilize the fracture fragments (Figs 10, 11).

DISCUSSION

Each individual case of intraoperative and postoperative mandibular fracture should be thoroughly analyzed to draw relevant conclusions for preventing such incidents. The main factors to consider are the position of the tooth, the surgical technique used, the condition of the bone prior to the procedure, and the course of the postoperative period [19, 20].

In the first case presented, the tooth's position was classified as class III, B, according to Pell and Gregory, with a vertical orientation. This means that the distance from the distal surface of the seventh tooth to the ascending ramus of the mandible is smaller than the mesio-distal crown dimension of the third molar, and it is at the level of the neck of the seventh tooth. The surgical technique used included mucoperiosteal flap formation, bone trepanation, separation of the molar crown, removal of the roots, thorough curettage, and suturing the flap. The bone in the operation zone showed no pathological changes preoperatively. The postoperative period proceeded smoothly until the patient started consuming hard food, increasing the force and pressure during chewing, which likely led to a spontaneous late postoperative fracture [4, 7, 18].

In the second case, the tooth's position was classified as class III, C, according to Pell and Gregory, meaning that the molar crown was partially located within the mandibular ramus, below the neck of the second molar, and horizontally positioned. The bone in the area was weakened due to the presence of a follicular cyst surrounding the crown of the molar and involving the roots of the seventh tooth. The surgical technique involved a mucoperiosteal flap from the vestibular side, bone trepanation, separation and extraction of the third molar, and removal of the cystic sac. The postoperative

Fig. 10. Temporary immobilization of the fracture during wisdom tooth extraction

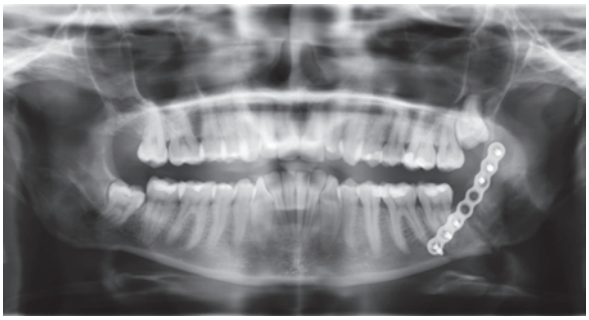

Fig. 11. Plate osteosynthesis

course was uneventful until three weeks later, when the patient consumed hard food, leading to a late postoperative fracture. In this case, the presence of the cyst significantly weakened the mandibular bone structure and delayed healing due to the formation of a larger cavity. In such cases, preoperative cyst decompression followed by extraction at a later stage should be considered. Elastic fixation or mini-screws for immobilization, as well as the preventive use of mini-plates, could help in preventing fractures [2, 9, 15].

In the third case, the position of the molar was again class III, B, according to Pell and Gregory, with a horizontal orientation. There were no pathological changes in the bone preoperatively. The surgical procedure was uncomplicated with no flap formation, no bone trepanation, and no separation of the tooth. The fracture occurred immediately during the procedure [4, 8, 21, 22].

CONCLUSION

Postoperative fractures of the mandible are unpleasant complications that significantly prolong the healing period and cause considerable suffering for patients. To reduce the occurrence of these incidents, each clinical case must be individually analyzed based on clinical data and radiographic examinations. Molar positions such as Class II, III, B, and C, are at higher risk of transmitting forces to the jaw. Combined with factors such as osteoporotic bone, pathological processes, and advanced resorption, the risk of fracture during the procedure is significantly increased. Separating the crown and roots of the tooth as a surgical technique helps reduce the risk of compromising bone integrity due to the reduction in applied luxation forces. Strict follow-up of patients, along with clear instructions for hygiene and dietary habits, are essential components of comprehensive postoperative care.

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Ethical statement: *This study has been performed in accordance with the ethical standards as laid down in the Declaration of Helsinki.*

Informed Consent from Participants: *Informed consent was obtained from all participants included in the study.*

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