

# Complications of Impacted Lower Third Molar Surgery and its Management- a review

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## **ABSTRACT**

*Surgical removal of the impacted lower third molar tooth is one of the most performed procedures in oral and maxillofacial surgery. Literature search was conducted to identify the pre-operative and post-operative complications associated with lower third molar surgery and the different modalities available for its management. The various complications associated with impacted lower third molar surgery and its management are discussed in this review article. The most common complications associated with third molar surgery are pain, swelling and trismus. It is concluded that complications after lower third molar surgery remains an important factor in quality of life in post-operative periods. As an Oral and maxillofacial surgeon should be aware of the complications, preventive measures and management to reduce pre-operative and post-operative complications.*

## **Introduction**

surgical removal of the impacted lower third molar tooth is one of the most performed procedures in oral and maxillofacial surgery. The pain, infection is the most common factors for the removal of third molar. There are many general and native factors that contribute to the impaction of a third molar such as position of tooth and adjust tooth size, different eruption pattern, soft tissue abnormality or the thick overlying bone.<sup>1</sup> Impactions can be classified into two types complete and partial impaction. When tooth is completely covered with bone and mucosa is known as completely impacted and the tooth is unable to get its normal functional position. when the tooth is partially visible and it exposed to oral cavity, but it is has failed to erupt fully into normal functional position is known as partially erupted. <sup>2</sup> The mandibular molars and maxillary molars are the two most commonly impacted molars, followed by maxillary canines and mandibular premolar. There are many factors which can be distinguished because the causative agents of a 3rd molar impaction like soft food diet and fewer usage of masticatory apparatus.<sup>3</sup> The age plays an important role in occurrence of impaction. Impaction is common within the age bracket of 20 to 30 and therefore the phenomenon reduces with the rise in age and at the age about 50 the occurrence is only about 14%.<sup>4</sup> Any surgery is not without complications. Several factors can cause complications during and after surgery. It is essential for the surgeon to possess an adequate idea about the various complications that can occur and the measures to manage them.

## **Pain, Trismus and Surgical Oedema**

Pain, trismus and surgical oedema are the foremost common complications that occur following impacted lower third molar surgery. immediately after the removal of third molar inflammation caused due to surgery occurs and it reaches to maximum level 2 to three days postoperatively and resolves by 7 days.<sup>5</sup> Unnecessary swelling can be prevented by reducing the amount of force applying on soft tissue Trismus is often the result of surgical trauma which occurs secondary to masticatory muscle inflammation [especially medial pterygoid muscle]. After surgery

pain begins when the anaesthesia given during surgery subsides and it continues to rise to peak in 6 to 8 hours. Analgesics drugs like paracetamol and non-steroidal inflammatory drugs either alone or in combination with steroids and narcotics has been given for management of pain.<sup>6</sup> In secondary wound healing pain is low when compared with primary wound healing. Longer the surgery longer the pain severity, swelling and trismus.

### **Post-Operative Infections**

The presence of huge sort of indigenous oral flora is the huge reason for postoperative infection. Post operative infection can be decreased by Achieving adequate haemostasis, meticulous tissue management, and complete lavage of extraction site. The mandibular bony impactions have the higher incidence of postoperative infection. Post-operative infections can be prevented by systemic administration of antibiotics.<sup>7</sup>

### **Alveolar Osteitis**

It is the most painful complication and it is also known as dry socket. Healing may occur in few weeks by sequestration or resorption of the necrotic bony walls of the socket with delayed epithelialization. Brin's fibrinolytics theory and the bacterial theory are two main theories stipulated currently for the etiopathogenesis of alveolar osteitis.<sup>8</sup> Dry socket occurs more common in females than males. Sweet and Butler (1978) found the incidence of alveolitis to be 4.1% in females versus 0.5% in males.<sup>9</sup> Following extraction of tooth, patient has initial improvement or reduction in pain experienced at the first 24 hours patient experience severe pain and that continues throughout the night, becoming more high after 72 hours post extraction. The socket may be crammed with a mix of saliva and food debris.<sup>10</sup>

### **Management of alveolar osteitis**

Dry socket is a self-limiting condition. Thus, it requires only symptomatic treatment. The treatment for a dry socket includes:

1. Retained roots and bony fragments should be removed with the help of radiograph
2. The socket should be irrigated with warm 0.2% chlorhexidine digluconate to remove necrotic tissue and so that any food debris are often removed.
3. Dressing [zinc oxide eugenol pack] to prevent food debris entering the exposed socket and causing local irritation.
4. Non-steroidal anti-inflammatory drug (NSAID) prescribed to patients according to their medical history.
5. Patients should be kept under review until the pain gets reduced and patient advised to irrigate the socket with chlorhexidine gluconate 0.2% with a syringe at home.<sup>11</sup>

Several studies have shown that use of chlorhexidine mouth rinse before and after surgery and use of chlorhexidine gel in extracted tooth socket has an ability to prevent dry socket.

### **Postoperative Bleeding**

Bleeding that occurs after extraction more than the average expected limit or continued bleeding which occurs beyond the postoperative window for clot formation. Excessive bleeding and haemorrhage occur in a range of 1-6% in third molar surgery. Excessive bleeding is said to occur most commonly in mandibular third molar surgery than maxillary molars and bleeding is seen more in older patients. This maybe because increase in age the vascular fragility is common, and the coagulation mechanism is less effective when compared to younger patients. Identification of patient's risk of bleeding complications after third molar surgery. Careful soft tissue management and local haemostatic measures can control most bleeding problems.<sup>12</sup> the danger of haemorrhage is lower in cases where primary wound healing occurs with promptly secured sutures. Most common complication is hematoma. Surgical emphysema is also another major complication due to forceful entry of air and water surgical procedure through the reflected mucoperiosteal flaps is a self-limiting disease which subsides on its own within a week.

### **Delayed healing and wound dehiscence**

removal of impacted tooth causes damage to both hard and soft tissues. The procedure involves mucoperiosteal flap is reflection, osteotomy and tooth removed and reposition the flap and suturing is done 13, 14 this is often called as primary wound healing. There are many designs for raising the mucoperiosteal flap and exposing the impacted lower third molar but the modified triangular flap and the envelope/sulcular flap is most used.

Many authors have given opinion that results are better with modified triangular, being significantly less likely to develop wound dehiscence and thus secondary healing of the wound.<sup>7</sup> Although, secondary healing may cause longer periods of discomfort to the patients and possibly increase the incidence of alveolar osteitis along with loss of gingival attachment distal to second molar, however has some advantages like reduction of swelling, pain and trismus after the surgery.<sup>15</sup> consistent with one study, flap design has no influence upon periodontal healing post-operatively and it is up to the operator to choose the flap design.<sup>16</sup>

### **Mandibular Fracture**

Mandible fracture mostly commonly in angle region is also a frequent complication of removal of lower third molar. the rationale for this major complication is believed to be multifactorial which includes patients age, sex, degree of impaction, relative volume of tooth within the jaw, pre-existing bony lesions, failure of maintaining pap within the post-operative period and surgical technique. Older patients aged above 40 have high incidence of fractures .<sup>17, 18</sup> Ankylosis of the impacted tooth among older patients also may complicate tooth removal and weaken the mandible. In order to reduce the amount of bone removal sectioning of tooth is additionally advised. Risk of fracture is additionally high in patient with full dentition can produce high level forces during mastication which can be directed to bone, weaken mandible and can cause fracture. Moreover, in mandibular fracture degree of impaction also plays a major role. Fully impacted teeth will have higher incidence of mandibular fracture, thanks to greater volume of bone necessary to be removed during the surgery, weakening the mandible. Bony lesions such as periodontal disease, cyst or recurrent pericoronitis also may weaken the mandible and cause fracture.<sup>19</sup> if there's an associated deeply impacted lower third molar tooth as it weakens the mandible.

### **Treatment modalities**

Treatment methods for mandibular angle fractures are:

- a) Reduction and fixation using inter maxillary fixation
- b) Wire osteosynthesis
- c) Lag screws
- d) Mini plates and screws

and there are many other techniques used to fix mandibular angle fractures, the only miniplate at the upper border has the least morbidity, with the lowest number of complications.

### **Damage to adjacent teeth**

Adjacent teeth damage is the most common complication during third molar surgery. This occurs because of the high force required to get rid of third molar, it's possible to damage the adjacent tooth.<sup>20</sup> Fracture of the adjacent teeth are often minimized if care is taken to see the entire operating field instead of the tooth or teeth to be extracted. If an adjacent tooth is luxated or gets avulsed the foremost common treatment is repositioning of tooth followed by fixation and immobilization for 3-4 weeks. Fixation can be done using of sutures laterally across the occlusal surface, dental wires, arch bars and composite splint. Patient is advised to be in soft diet. Care should be taken to prevent accidental displacement of lower third molar into submandibular, lingual or pterygomandibular spaces during the surgical procedure.

### **Periodontal defects in third molar surgery**

Surgical extraction of third molars usually requires a gingival flap and osteotomy which can cause other complications like gingival changes, loss of bone, development of periodontal pockets and exposure of cementum

on the distal aspect of second molars.<sup>22</sup> Studies have observed that after removal of third molar there is higher chances of greater periodontal breakdown, such as loss of attachment, higher incidence of plaque, gingivitis and periodontal pocket in adjacent second molar. This is said to occur thanks to the influence of aging over the healing function.<sup>23</sup> usually healing occurs faster in younger people than in older. The cellular immunity against dental plaque is decreases with age. A low immune response could produce different periodontal responses between younger and elder patients and the physiological changes in periodontium increases with age.<sup>24</sup>. Besides age, other factors which may influence periodontal healing is preoperative intra-bony defects or probing depths, the size of the contact region between second and third molars and root resorption.<sup>24</sup>

### **Nerve Injury**

During surgical removal of lower third molar there is higher risk of damaging both the lingual and inferior alveolar nerves. Surgical intervention [micro neurosurgical repair] for a damaged inferior alveolar nerve or lingual nerve isn't usually indicated but maybe undertaken immediately if the nerve is totally divided and the severed ends are misaligned.<sup>25</sup>

### **Inferior alveolar nerve**

The inferior alveolar nerve travels within mandible. In the mandibular canal it's supported by connective tissues and other structures within the neurovascular bundle. Radiographic examination shows the relationship between lower molar and inferior alveolar nerve.<sup>10</sup> A higher incidence of inferior alveolar nerve damage seen with horizontally or mesioangularly impacted third molar with complete bone coverage.<sup>26</sup> Coronectomy is a procedure followed to prevent injury to the inferior alveolar nerve in high risk cases.

### **Lingual nerve**

The lingual nerve is not same as the inferior alveolar nerve. The nerve is covered

only with a thin layer of soft tissue and mucosa rather than being in a bony canal. Several studies have shown the lingual nerve damage lifting and raising of lingual mucoperiosteal flap has greater risk of damaging lingual nerve.<sup>27</sup> Deeply impacted teeth with high difficulty in removing has more chances to damage lingual nerve <sup>28</sup>.

### **Buccal Nerve**

This nerve descends between the 2 parts of lateral skeletal muscle, medial to the ramus of the mandible, then passes laterally across the external oblique ridge distal to the third molar to supply the cheek. As the nerve crosses the external oblique ridge it's made from between one and five branches, rock bottom of which maybe 1cm below the deepest concavity of the ridge. The buccal nerve has higher risk during the distal relieving incision in third molar surgery .<sup>29</sup>

### **Treatment modalities**

Most cases of nerve damage during wisdom tooth removal are not identified at the time of removal but in the post-operative period. The careful monitoring of sensory recovery over three-month period helps in distinguish between different types of injury and helps to conclude whether the nerve is likely to risks and complications. recover, or any surgical intervention will be required. No Surgical intervention is required for paraesthesia. Monitoring the recovery of sensation in the numb area is done by application of stimuli to the numb area. Patient response and feedback helps indicate the first formation of regenerating nerve ends and then subsequently the level of recovery.<sup>30</sup>

### **CONCLUSION**

Lower third molar removal is most common procedure in oral surgery, but it is associated with many Periodontal Defects in Third Molar Surgery. Anyhow the significant complications are rare but early diagnosis and management can reduce morbidity and mortality rate. Morbidity increases with age of the patient, duration of the surgery, depth of the impaction within the bone and sex of the patient [complications are more in females].

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