An overview of complications associated with impacted third molar surgery

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INTRODUCTION

Third molar impactions are being the most common problem that an oral and maxillofacial surgeon encounters in their daily clinical life.[1] In literature, many popular theory explains about the reduction of jaw size that ended-up in impactions.[2] The first known impaction was from the Magdalenian period (18,000–10,000 B.C.) on European woman.[3] The third molar teeth can be observed as early from the age of 5–16 to as late as 24 years of age and which erupt at an average age of 18 and that also varies with different races.[4] Out of which only 50% only erupt. Impactions are being more common in mandible rather than that of a maxilla, with female predominance in most of the populations. Impactions in mandible are either soft tissue or bony impaction (full/partial).[2,4]

Need for Extraction

Almost 50% of the impacted third molars are affected by pathological conditions that lead to extraction. Even though extraction of the asymptomatic third molar is done as a prophylactic manner, it is considered as a “Public Health Hazard,” unnecessary surgical procedures cause postsurgical complications.[2] The National Institute of Clinical Excellence of England gave guidelines for third molar surgery which was against the prophylactic removal, but few studies of Garaas et al., Fisher et al., Mansfield et al., White et al., Rajasua et al., Ahmad et al., and Venta et al. explained the future risk of the tooth which can lead to pathologies, that supports extraction.[2] National Institutes of Health recommends extraction of partially/fully impacted third molar associated with follicular space enlargement and soft tissue must be histologically examined.[5] The surgical complications must be explained to the patients before the procedure and documented.[6]

Complications

Risks of complications are about 2.6–30.9%.[6] Complications related to the third molar impactions are

• Intraoperative
• Post-operative
• Others

Some of the intraoperative complications are fracture of mandible, damage of adjacent teeth, displacement

ABSTRACT

Impacted lower third molar surgical removal is one of the most commonly performed procedures, but it is associated with complications which are said to affect the quality of life of patients. It is, therefore, essential for the oral maxillofacial surgeon to have an adequate knowledge on the complications and the different scientific modalities available to alleviate them to reduce the morbidity associated with the procedure. This review is aimed at discussing the various complications causing morbidity and sometimes rarely, mortality following the surgical removal of mandibular impacted teeth and the various strategies and measures available to minimize these complications at various levels.

KEY WORDS: Complications, Impaction, Third molar surgery

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into soft tissue spaces and bleeding. Examples of post-operative complications are pain, swelling, bruising, trismus, dry socket, and surgical site infection. The overall complications and severities are directly proportional to the depth of impaction and age.

**Complications Based on Degree of Impaction**
Depth of impaction and proximity of the canal causes nerve injury. Class II and III type C show more complications.

**Complications Based on Age**
Bruce and Chiapasco *et al.* proposed that old patient are more prone toward post-operative complications. Extractions are advised to be done before the age of 25 since young people tend to have lower risk and less complications. Blondeau and Daniel recommend to avoid prophylactic extraction above age 25. De Siva reported complications such as fracture above the age of 25.

**Complications Based on Sex**
Females show more complications postsurgically, Monaco *et al.* support it, females with Pell and Gregory I C and II C show more complications and also tend to have more intraoperative fractures (Male:female 1:1.3).

**Complications Based on Time for Surgical Procedure**
The prolonged surgical procedure causes tissue damage and an increase in vascular permeability causing edema. A lingual technique using chisel and mallet takes minimal time comparatively. Modified JD classification not only predicts the time for the procedure but also helps in proper scheduling both in terms of operators and patients.

**Complication of Hemorrhage**
- Late
- Recurrent
  - Late hemorrhage happens at the end of extraction.
  - Recurrent hemorrhage is a multiple time incident which occurs during the procedure.
- Intraoperative hemorrhage
- Post-operative hemorrhage.

Vivek *et al.* concluded that there were no significant differences with bleeding whatever techniques used.

**Medical History**
A proper medical history must be recorded, patients with deficient intrinsic factors, under contraceptive pills, smokers, and blood thinners may lead to increased bleeding, dry socket, and pain. Women on oral contraceptive pills have 5 times higher chances to get dry socket.

**Investigations**
Impacted third molars are usually investigated with the help of radiographs of which the periapical radiographs (IOPA) are commonly followed by panoramic radiographs. However, these radiographs show some disadvantage low image resolution, high distortion, and phantom image that produces an apparent change of some vital structures failure in buccolingual relation of the tooth to inferior alveolar canal due to the 2-D image. Thus, a cone beam computed tomography is adopted to get an 3-D image around third molar which reduces optimal risk of inferior alveolar nerve injury studied by Ghamenia *et al.* and reconfirmed by Matzen *et al.* and Rood and Shehab.

**Classification**
A classification helps in assessing the degree of impaction and approach to minimize complication. Radiographs play an important role in classifications.

Based on angulations of the third molar to the second molar Winter (1926) classified impactions into:
- Mesioangular
- Distoangular
- Horizontal
- Vertical
- Buccolingual
- Others.

This position tells us about the severity of the removal of the tooth. Vertical impactions are the most common type.

- Mesioangular – least difficult.
- Horizontal – more difficult.
- Vertical – more difficult than mesioangular and horizontal.
- Distoangular – most difficult.

Note: Difficulty denotes more bone removal which leads to more complications.

Classification of impaction was given by Pell and Gregory in 1933 based on:
- Position of third molar anterior-posterior to the ramus
- Class 1 – Mesiodistal diameter of the third molar is anterior to the anterior border of the ramus.
- Class 2 – Half of mesiodistal diameter of the third molar is covered by ramus.
- Class 3 – Third molar completely within ramus.

Difficult in removal class 3 > 2>1
Vertical relationship of occlusal plane of the third molar to second molar

Class A – Occlusal plane of third and second molar at the same level

Class B – Occlusal plane of third molar is between the occlusal and cervical plane of second molar.

Class C – Occlusal plane of third molar is below the cervical plane of second molar.

Class 1 and Class A – More easy removal.

Class 3 and Class C – Most difficult removal.

Complications are more in I C and II C.[8]

Gracia et al. and Diniz-Freitas et al. reported that time duration cannot be predicted with Winter and Pell and Gregory classification.[5]

Juodzbalys and Daugela (JD) 2013 classified based on the anatomical position, radiological features.[4]

**NJ CLASSIFICATION**[5]

Modified JD classification 2018 is a reliable tool for predicting procedure time and difficulty of impacted mandibular third molar extraction which results in decision-making.[5] Total score range from 0 to 18 points and divided into three classes.

Class I: 0–6 points-[simple]

Class II: 7–12 points-[moderate]

Class III: 13–18 points-[complicated].

**Approaches**

The third molar removal by

- Intraoral approach
- Extraoral approach

Of which only intraoral approaches are discussed here.

**Surgical Techniques**

Intraoral surgical techniques are:

- Lingual spilt technique using chisel and mallet
- Buccal approach technique using chisel and mallet
- Bur technique.

Vivek et al. concluded that Lingual split technique is better than others comparatively.

- Piezotome technique

Piezotome technique can reduce the postoperative complications compared to bur technique.[10]

**Flap Type**

There is no significant difference in the type of flap created interns of swelling, but Kirk et al. proposed there is a difference in terms of pain and swelling with buccal flap and modified triangular flap by SZMYD.[6]

**Suture Type**

Pasqualini et al. based on compared tight sutures with suture removed distal to second molar by 5–6 mm allows draining there is a huge difference observed on the 2nd and 4th day in terms of swelling but tight suture shows peak swelling on the 3rd day.[8] According to certain authors, tight sutures causes edema, inflammation, dry socket, and pain. Use of draining tube can also facilitate reduced post-operative complications, Rakprasitkul and Pairuchvej supported reduced swelling with drainage tube.

**PRE-OPERATIVE AND POST-OPERATIVE MEDICATIONS**

**Corticosteroids (pre-operative/post-operative)**

Recommendation of the corticosteroids for reduction of swelling given postoperatively.[8] It suppresses the vasoactive substances such as prostaglandins and leukotrienes during the initial inflammatory process that reduces fluid transudation and edema. The recommended dose must be more than the normal corticosteroid level of the body. Elhag et al. proposed that 10 mg dexamethasone IM, 1 h before surgery with the administration of pre- and post-antibiotic medication after 10–18 h is better than treatment without steroids. Steroid administrated patients show less trismus.[8]

**Analgesics**

Analgesics are prescribed before and after extraction. The most common analgesics used are paracetamol, NSAIDs.[6]

**Antibiotics**

Antibiotics reduce the risk of infections, dry socket, and pain. When they are used pre- and post-surgically, antibiotics show mild and adverse effect. Topical placement of cyclosporins also reduces dry socket.[6]

**Irrigation**

Irrigation of the socket with chlorhexidine and sterile saline reduces dry sockets by 50%.

**Post-operative Instruction**

Soft food is recommended for 4 weeks after extraction; ice pack can reduce pain.

**Review**

A review after 1 week (8th day) must be done to evaluate pain, trismus, and neurosensory deficits.

**CONCLUSION**

A proper pre-operative radiological assessment, knowledge on equipment and surgical procedures, skill, training, and experience of the oral surgeons
can minimize the complications following surgical removal of the impacted third molar.[11]

The complications faced during the exodontia of the third molar remains an important factor in the quality of life in post-operative periods. These untoward complications arising sometimes is an unavoidable side effect which cannot be completely eradicated but it can minimized.[12]

This review enlightened the various complications of third molar surgery and the methods of managing them efficiently to reduce the morbidity associated with it.

REFERENCES


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