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Third Molar Impaction and its Clinical Correlation- A Systematic Review

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Abstract: ***Aim: To determine the intensity of the impacted third molar and its clinical correlation. Objective: This study was done to check the impacted third molar and to study its clinical correlation. Background: A wisdom tooth or third molar is one of the three molars per quadrant of the human dentition.Wisdom teeth generally erupt between the ages of 17 and 25.Wisdom teeth commonly affect other teeth as they develop becoming impacted or "coming in sideways." They are often extracted when this occurs.Impacted wisdom teeth (or impacted third molars) are wisdom teeth which do not fully erupt into the mouth because of blockage from other teeth. Impacted wisdom teeth are classified by their direction of impaction, their depth compared to the biting surface of adjacent teeth and the amount of the tooth's crown that extends through gum tissue or bone. A lack of room to allow the teeth to erupt results in a risk of periodontal disease and dental cavities that increases with age. Only a small minority of adults age 65 years or older maintain the teeth without caries or periodontal disease and 13% maintain unimpacted wisdom teeth without caries or periodontal disease. Reason: This study may help people in understanding the significance of the third molar impaction.***

Keywords: Impacted third molar, extraction, anaesthesia, bleeding, gauze, inferior alveolar nerve, lingual nerve, complications

1. Introduction

Third molar also known as wisdom teeth are the last teeth to erupt in the oral cavity. This generally occurs in the ages between 17 to 25, a time that has been called as the age of wisdom[1].

Anthropologists say that the rough diet of early humans resulted in excessive wear of their teeth. Normal drifting of the teeth to compensate for this wear ensured that space was available for most of the wisdom teeth to erupt by adolescence[2]. The modern diet which is much softer, and the orthodontic tooth straightening procedures produce a fuller dental arch[3], which quite commonly doesn't allow room for the third molar to erupt thereby setting the stage for the problems such as impaction when the final four molars enter the mouth[4,5].

Impacted tooth is defined as the tooth that is prevented from entering into the oral cavity due to malposition, lack of space or other impediments within the expected time[6]. Impacted third molar teeth are classified by their direction of impaction, their depth compared to the biting surface of adjacent teeth and the amount of the tooth's crown that extends through gum tissue or bone[7]. Impaction of teeth occurs in 73% of young adults[8]. The average age of third molar eruption in males is 3 to 6 months ahead of females and it is found that females are more prone to third molar impaction than males[9]. Third molar eruption and positional changes after eruption can be related with the nature of diet, race, genetic background and intense use of masticatory apparatus[10]. A lack of room to allow the teeth to erupt results in a risk of periodontal disease and dental cavities that increases with age[11]. Only a small minority of adults age 65 years or older maintain the teeth without caries or periodontal disease and 13% maintain unimpacted wisdom teeth without caries or periodontal disease[12].

Impaction of third molar is a common condition related to the difficulty in degree of extraction and complications including iatrogenic trigeminal nerve injury[13,14].

2. Clinical Anatomy of Third Molar

Third molar is situated at the distal end of the body of the mandible where it is in connection with the ramus of the mandible. In other ways It is found in anterior to the pterygomandibular raphae[15]. There is a region of weakness and fracture can occur if excess force is applied during impaction of the wisdom tooth elevation. The roots of third molar are in close proximity to mandibular canal. They can penetrate into the mandibular canal or can be deflected. These canals with roots can evoke inferior alveolar nerve damage[16]. The buccal alveolar bone is thicker than the lingual. The lingual nerve lies close to the third molar, therefore there is a high risk of lingual nerve damage while performing lingual split technique or elevating third molar flap medially to the distoangular recess.[17]

3. Surgical Extraction of the Third Molar Tooth

Before the removal of the third molar there are certain conditions that are necessary to be checked such as position of the tooth and root development. Third molar removal may require a more involved surgical procedure[18]. Most of the wisdom tooth are removed with the help of the oral and maxillofacial surgeon. The surgery initially begins with the administration of local anaesthesia, intravenous sedation or general anaesthesia[19].

- **Local anaesthesia:** It is administered with one or more injections near the site of extraction.
- **Sedation anaesthesia:** It is given through an intravenous(IV) line in the arm. It suppresses the consciousness during the procedure.

- **General anaesthesia:** Medication is inhaled through the nose or given an IV line in the arm. Then medication, breathing, temperature, fluids, and blood pressure are monitored[20].

Procedure

- Incision is made in the gum tissue to expose the tooth and the bone[21].
- Removal of the bone that blocks access to the root.
- Tooth is divided into sections.
- Tooth is removed.
- The site of the removed tooth is cleaned of any debris or bone.
- Wound closure by stitching the wound to promote healing.
- A gauze is placed over the extraction site to control bleeding[22].

Post Operative Healing

Immediately following the removal of tooth, bleeding commonly occurs. Pressure is applied by biting on the gauze swab for at least 30 minutes and it should be left undisturbed. A thrombus forms in the socket[23]. Antibiotics are prescribed to reduce the risk of certain post extraction complications[24].

- **Smoking:** The patient should stop smoking as it reduces the ability for the blood to clot and also retards healing.
- **Pain:** some discomfort is normal after surgery. To minimize pain some medications such as nuprin, Tylenol, advil or some non aspirin pain reliever should be taken every 3 to 4 hours along with the diet.
- **Swelling:** Icebags should be applied over the operated area to minimize swelling. It should be applied every 15 minutes[25].
- **Brushing:** It should not be done for the first 8 hours after surgery. After this it can be done gently.
- **Rinsing:** Rinsing should be avoided for 24 hours after extraction. Rinsing can disturb the formation of healing blood clot. This could cause rinsing and the risk of dry socket. After 24 hours it can be done with salt water solutions.
- **Diet:** soft foods are to be taken for first two days. Plenty of water must be taken[26].

Instruments Used In Extraction

- **Lower molar foreceps:** The lower third molar has bifurcated root with variable root pattern. Therefore the foreceps will need a twin beak on eighter side.
- **Upper molar foreceps:** upper molar has three roots(two buccal and one palatal). The foreceps are twin beaked on the buccal and have a side blade palatally. Because of asymmetrical beaks, the instrument is not reversible and separate beaks are needed on right and left side.
- **Bayonet foreceps:** It has blades offset substantially in distal direction. The shape resembles bayonet rifle attachment.
- **Cowhorns foreceps:** It penetrates between the roots of molars to split the roots especially if the roots are diverged.
- **Elevator:** They differ from foreceps in the manner in which the force is applied. The elevator applies forces between the tooth and the bone. This is an instrument especially used to remove impacted teeth. They exert less directional force so tooth is less likely to be fractured.
- **Scalpel:** It is used to make incisions on the gums where a flap can be raised to gain access to tooth.
- **Chisels and mallet:** They are useful for distoangular third molars and upper third molar extraction.
- **Surgical burs:** Used as a straight hand piece, burs are used to remove bone surrounding the tooth to be apart.
- **Bone curette:** It is probably the most valuable instrument and are used to remove the granulation tissue from the tooth socket[27].

4. Complications

- **Dry socket (alveolar osteitis):** is a painful phenomenon that mostly occurs after the removal of lower third molar teeth. It typically occurs when the blood clot with the extraction site is disrupted. The empty socket causes ache or throbbing pain in the gingival and can be intense[28]. The pain is the only symptom seen which radiates up and down the head and neck. There are evidences that the use chlorohexidine can prevent the extent of dry socket but the risk factors increases with smoking after extraction [29].
- **Nerve injury:** Injury to sections of nerve is another complication of wisdom tooth removal. This can cause pain, a tingling sensation and numbness in the tongue, lips, teeth and gums[30]. A nerve injury can interfere with our daily activities, making things such as eating and drinking difficult and painful[31]. There are two types of nerve injury:
  1) **Inferior alveolar nerve injury:** This nerve enters the mandible at the mandibular foramen and exits the mandible through the mental foramen[32]. It supplies the sensation of the lower teeth. Injury is caused while lifting the tooth upwards during extraction. It also causes loss of sensation to all the teeth[33].
  2) **Lingual nerve injury:** This nerve is a branch of mandibular nerve which in turn is a branch of trigeminal nerve. It gives off a sensory branch to the tongue by the chorda tympani nerve[34], Therefore damage to this nerve causes loss of pain and numbness in the anterior two-thirds of the tongue[35]. It is commonly accepted to be 2% temporary and 0.2% permanent[36] .
- **Sinus:** The maxillary sinus lies above the roots of molars. The bony floor of the sinus divides the tooth socket from the sinus. Therefore extracting upper third molar can result in sinus exposure[37].

5. Conclusion

The information provided above about the third molar impaction and its extraction and complication is promising to be a helpful tool for impacted tooth assessment as well as for planning surgical operation.

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