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A Surgical Removal of the Impacted Mandibular Third Molar

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Abstract
A tooth is said to be impacted when its path of eruption into the occulsal plane is obstructed by the presence of another tooth, bone or soft tissue. Surgical removal of an impacted third molar is one of the most common oral surgical procedures performed by most dental surgeons and it requires a sound understanding of surgical principles and patient management skills. Careful examination, surgical planning, atraumatic surgical removal with proper postoperative care for successful procedure. Inferior alveolar nerve block, buccal nerve block, lingual nerve block, and local infiltration for homeostasis in the surgical field with 2% lidocaine hydrochloride were administered (1:80000 epinephrine). Bone Removal and crown sectioning using straight handpiece and a luxator**(API L3IC, API L3C)** used to luxate and remove the roots, the teeth were extracted and the socket was irrigated with normal saline, bony irregularities were corrected and sutures placed causing complete closure of the surgical site. Following the procedure, detailed postoperative instructions were given to the patients, and suitable antibiotics and analgesics were prescribed. After 5-7-day follow-up was done and no complications were reported.

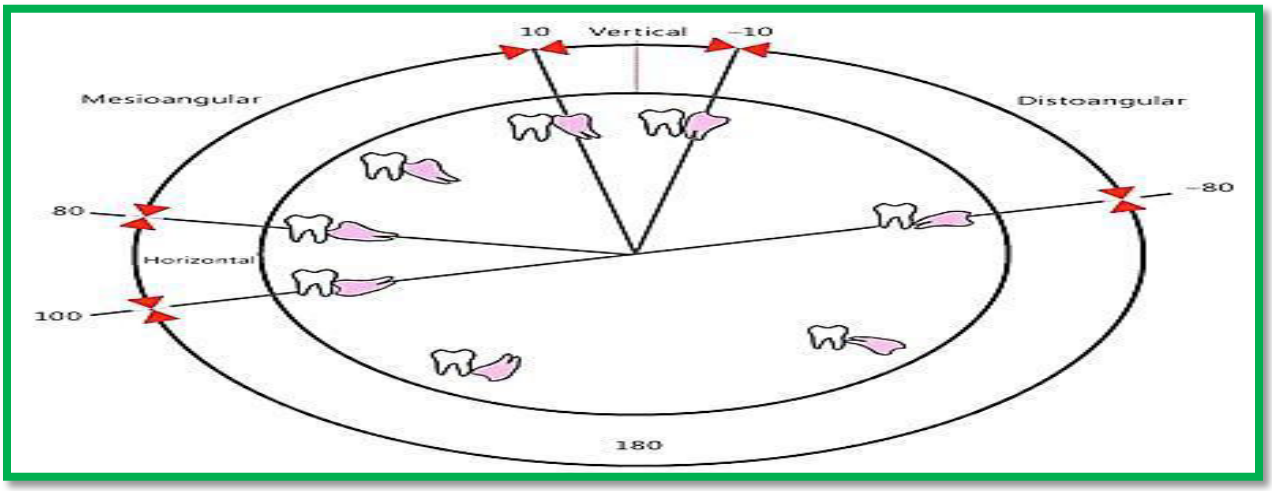
Introduction

An impacted tooth is described as a "tooth that cannot or willnot erupt into its normal functioning position, and is therefore pathologic and requires treatment[1]. Farman in 2004 defined impacted tooth that is prevented from eruption due to a physical barrier with the path of eruption[2].Localfactors that are responsible for tooth impaction include mechanical impediment by a cyst, tumor, or supernumerary tooth, and inadequate space in the dental arch results from micrognathia, premature exfoliation of deciduous teeth, and discrepancy in tooth arch size.It is generally believed that third molar agenesis or impaction occurs because of the ongoing evolutionary decrease in the size of the human jaw, which increases the difficulty for accommodating the corresponding molars[3].Impaction of the third molar occurs in different angulations,which are guided by local causative factors[4]. According to Winter's classification, angulation of the third molar can be vertical, mesioangular, horizontal, and distoangular impactions[5]. Generally, when a tooth fails to erupt greater than 1 year after the common age for eruption, it is considered to be an "impacted tooth[6]. The mandibular third molar was found to be the most commonly impacted tooth followed by the maxillary third molars, maxillary canines, and mandibular premolars[7]. The third molars also seem to be congenitally missing in some Jordanian students (9.1%)[6]. Extraction techniques using proper surgical protocols and correct technical approach permit efficient extraction

procedures and decrease intraoperative complications which may include bleeding, damage to adjacent teeth, injury to surrounding tissues, displacement of teeth into adjacent spaces, fracture of the root, maxillary tuberosity, or the mandible. Postoperative complications may include swelling, pain, trismus, prolonged bleeding, dry socket, infection, and sensory alteration of the inferior alveolar nerve or lingual nerve. The extractions of impacted mandibular third molars are one of the most common complaints that require surgical intervention[8,9].

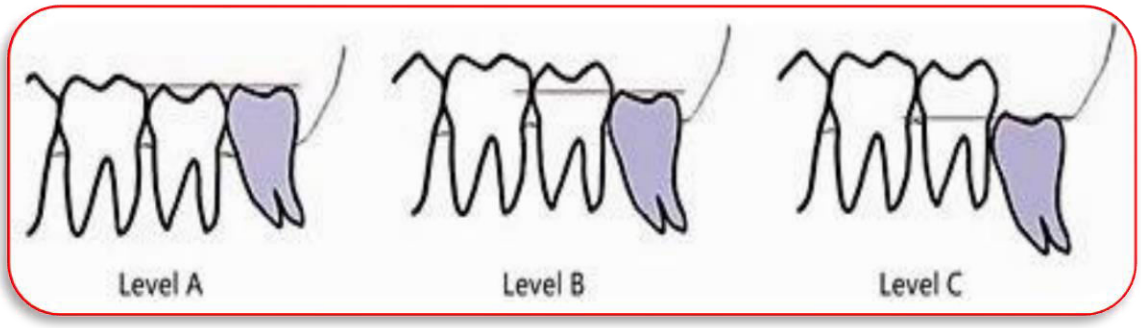
Winter's classification

Vertical impaction: the long axis of the third molar is parallel to the long axis of the second molar (from 10 to -10°).
Mesioangular impaction: the impacted tooth is tilted toward the second molar in a mesial direction (from 11 to 79°).
Horizontal impaction: the long axis of the third molar is horizontal (from 80 to 100°).
Distoangular impaction: the long axis of the third molar is angled distally/posteriorly away from the second molar (from -11 to -79°); others (from 101 to -80°).



Pell and Gregory classification

Level A: the occlusal plane of the impacted tooth is at the same level as the occlusal plane of the second molar (the highest portion of the impacted third molar is on a level with or above the occlusal plane).
Level B: the occlusal plane of the impacted tooth is between the occlusal plane and the cervical margin of the second molar (the highest portion of the impacted third molar is below the occlusal plane but above the cervical line of the second molar).
Level C: the impacted tooth is below the cervical margin of the second molar (the highest portion of the impacted third molar is below the cervical line of the second molar).

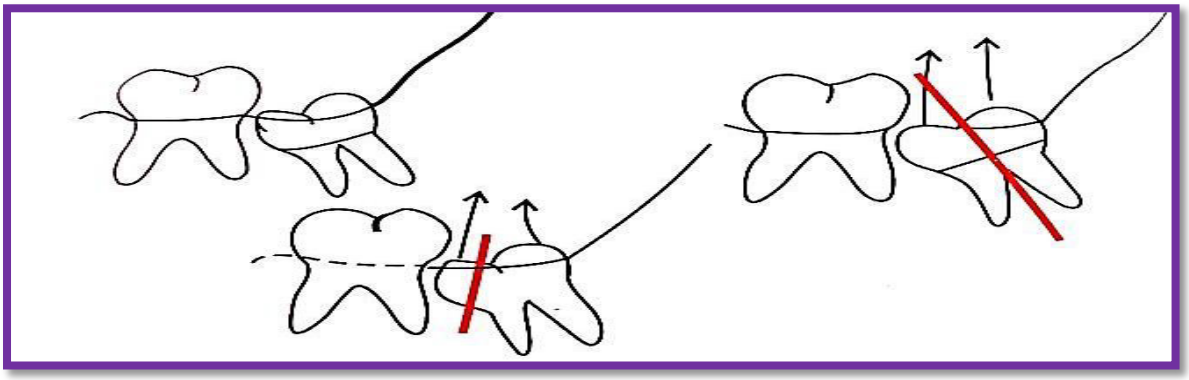


Material and Methods

Case Report: A 30 years old male patient had reported in my clinic with the chief complaint of pain for the past 1week. On examination patient was moderately built and well nourished. On extra oral examination Mouth opening was within normal limit.
Investigations: Routine hematological examinations including bleeding and clotting time were found to be normal. Based on history and clinical examination a provisional diagnosis of Pericoronits in the right lower back tooth region (48) was made.
Armamentarium: The basic instruments required for the removal of third molars are:

1. **Diagnostic instruments:-**Mouth mirrior, Explorer and Cheek retractor.
2. **Surgical instruments:** Syringe with 25-gauge needle, LA solution, Scalpel handle with No.15 blade, Austin's flap retractor.
3. **Bone cutting instruments:** Surgical handpiece high speed, Bone Burs- round and straight fissure bur.
4. **Instruments for tooth Luxation and removal:**API L3IC, API L3Cluxators, Straight or coupland's elevator, lower third molar forcep.
5. **Other requirements: Needle holder, tissue** holding forceps, suturing material, surgical scissors, suction tip and tongue depressor.

Different options for splitting mesioangular impactions:



Treatment: A 30years old male patient reportedin the clinic suffering from continuous pain in the mandibular right back tooth region. The patient was explained about the procedure and informed consent was obtained. Patient had no past medical history or systemic diseases, conventional X-ray examination (periapical) showed mesioangular impaction of the right mandibular third molar and the case were indicated for surgical removal of the impacted third molar.

Surgical Method. Step 1: anesthesia: inferior alveolar nerve block, buccal nerve block, lingual nerve block, and local infiltration for homeostasis in the surgical field with 2% lidocainehydrochloride were administered (1 : 80000 epinephrine).
Step 2: Gaining access to the impacted tooth: incision for a triangular flap extending to the middle buccal gingival sulcus of the mandibular second molar with surgical blade and slightly reflected from both incision sites enough to expose the crown using mucoperiosteum elevator.

Step 3: Bone Removal and crown sectioning using straight handpiece and a luxator**(API L3IC, API L3C)**used to luxate and remove the roots, the teeth were extracted (Figures 1-4), and the socket was irrigated with normal saline, bony irregularities were corrected and sutures placed causing complete closure of the surgical site.Following the procedure, detailed postoperative instructions were given to the patients, and suitable antibiotics and analgesics were prescribed.

FIG.1 Pre-operative IOPA 48

FIG.2,3 Sectioning of the mesial part and complete removal of the tooth

FIG.4 Post-operative photograph

Postoperative Follow-Up. Patient presented to the clinic 7 days after the surgical procedure for the follow-up process and the sutures were removed and complete tissue healing was noticed.

Discussion

The level of impaction assessed based on the Pell and Gregory classification showed that level B impaction was the most common in the maxilla, similar to the study of Hassan[10], while that of level C was the most common in the mandible. Pericoronitis is a soft tissue infection located around the crown of a partially impacted tooth, whose appearance implies the accumulation of microorganisms and food remains[11]. The impact of gender on the development and frequency of pericoronitis has been reported in the literature. In contrast, Batainehet al.[12]reported that pericoronitis cases were much more frequently seen in female patients than male patients. Likewise Yamalık and Bozkaya[13] found a predominance of females for pericoronitis. However, Almendros-Marquéset al.[11] and Akarslan and Kocabay[14] found no gender predominance for all complaints and pathologies.The eruption level of third molars has also an impact on the development of clinical symptoms and most of the impacted molars with pericoronitis had erupted to the same level as the adjacent second molar occlusal plane. Third molars are the teeth that most commonly follow an abortive eruption path and become impacted. Lack of space seems to be the major cause of abortive eruption. However, eruption cannot be guaranteed despite adequate space available in the jaw[15]. The development of space for the third molar is governed by many factors, including resorption of bone from the anterior border of the ramus, backward slope of the anterior border of the ramus in relation to the alveolar border, forward movement of the dentition, growth in length of the mandible and sagittal direction of mandibular growth[16]. In the present study, we found a significant difference in retromolar space for levels of impaction. Also the retromolar space seemed to decrease while the impaction level was increased. In accordance with our finding, Björket al.[17] reported that the space behind the second molar was reduced in 90% of cases with mandibular third molar impaction. Ganss et al.[18] reported that when the retromolar space is 13.9 mm in women and 14.3 mm in men, the probability of eruption is 70%. Later on, Ventäet al.[19] stated that if the retromolar space is at least 16.5 mm, the probability of eruption is 100%.

Conclusion

Patients with an impacted lower third molar had a tendency to develop pericoronitis. There are several intraoperative and postoperative complications that might occur during and after the extraction of the impacted mandibular third molar which can be reduced by understanding the possible causes and how to prevent each of these complications.

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