

Management of Impacted teeth – Part I

Any tooth can be classified as an “impacted tooth”, if it fails to erupt into the dental arch during the expected range of time. On the other hand, the term “unerupted tooth” refers to teeth that are impacted and teeth in the process of eruption.

Theories of impaction:

- **Phylogenetic theory:** Due to evolution, the human jaws become smaller with successive generations, and hence the 3rd molar is the last tooth to erupt there will be no adequate space to accommodate it.
- **Mendelian’s theory:** This theory entails that subjects can receive, by genetic predisposition, small jaws from one of their parents and large teeth from the other, therefore, impaction occur.
- **Nodine theory:** This theory summarizes that the growth of the jaws is stimulated by mastication. Since the modern diet is soft, this stimulation is lost and impaction can occur in modern humans.

Classification of Impacted lower 3rd molars:

Different classification systems existed to facilitate communication between health care providers, allow proper documentation of the cases and to predict the surgical difficulty and any anticipated complications.

- **Winter's Classification :**

This classification system compares the long axis of the 3rd molar in relation to the long axis of the adjacent tooth (i.e. 2nd molar). The following sub-classification can be encountered:

1. **Mesioangular:** The most common and easier to manage (Fig.1).
2. **Vertical:** Second most common in occurrence (Fig.2).
3. **Distoangular:** The most difficult situation encountered, this can be attributed mainly to the following (Fig.3):
 - a. The path of withdrawal runs into the mandibular ramus.
 - b. Significant surgical intervention is required.
 - c. The mesial root can be in very close proximity to roots of the lower 2nd molars.
4. **Horizontal:** Here the long axis of the 3rd molar is perpendicular to the long axis of the adjacent tooth (Fig.4).
5. **Transverse:** this category includes 3rd molars in buccolingual horizontal direction. The occlusal surface can be in buccal or lingual direction (Fig.5).



Figure 1 Mesioangular lower 3rd molar.



Figure 2 Vertical lower 3rd molar.



Figure 3 Distoangular lower 3rd molar.



Figure 4 Horizontal lower 3rd molar.



Figure 5 Transverse lower 3rd molar.

- **Pell and Gregory Classifications:**

This classification system classifies the position of the 3rd molar according to the relationship with the mandibular ramus into the following categories (Fig.6):

1. **Class 1:** In this category the crown of the 3rd molar is completely anterior to the anterior border of the ramus. (i.e. enough space available to accommodate the crown of the 3rd molar).
2. **Class 2:** If nearly half of the crown is buried within the ramus, this is class 2 relationship.
3. **Class 3:** in this type of relationship, the crown of the 3rd molar is completely embedded in the mandibular ramus.

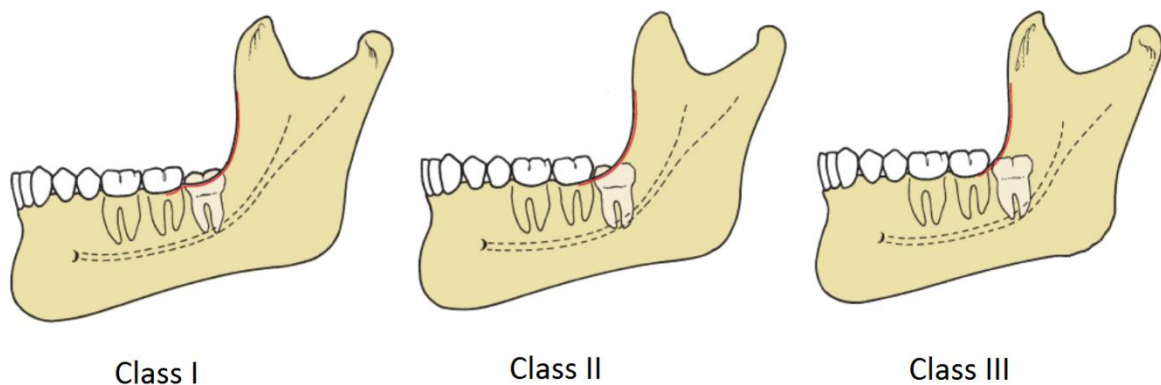


Figure 6 Position of the 3rd molar according to the relationship with the mandibular ramus.

The surgical accessibility is greater in class 1 relationship and it's the easiest to manage. Contrarily, class 3 relationship is the most difficult situation encountered, the surgeon anticipate significant amount of bone removal to access the 3rd molar.

Pell and Gregory system also includes classification of the relative depth of the 3rd molar to the adjacent tooth; the classification includes the following classes (Fig.7):

- 1. Class A:** In this class the highest portion of the 3rd molar is at or nearly at the level of the occlusal surface of the adjacent tooth.
- 2. Class B:** This category includes impacted 3rd molars with the highest portion situated between occlusal plane and cervical line of the adjacent tooth.
- 3. Class C:** This class entails cases with 3rd molars seated deep with their highest portion below the cervical line of the adjacent tooth.

Indication of 3rd molar surgery (Nice, 2015):

According to national institute of clinical excellence in England and Wales, the following recommendations were given in regards to 3rd molar surgery:

- The practice of prophylactic removal of pathology-free impacted third molars should be discontinued.

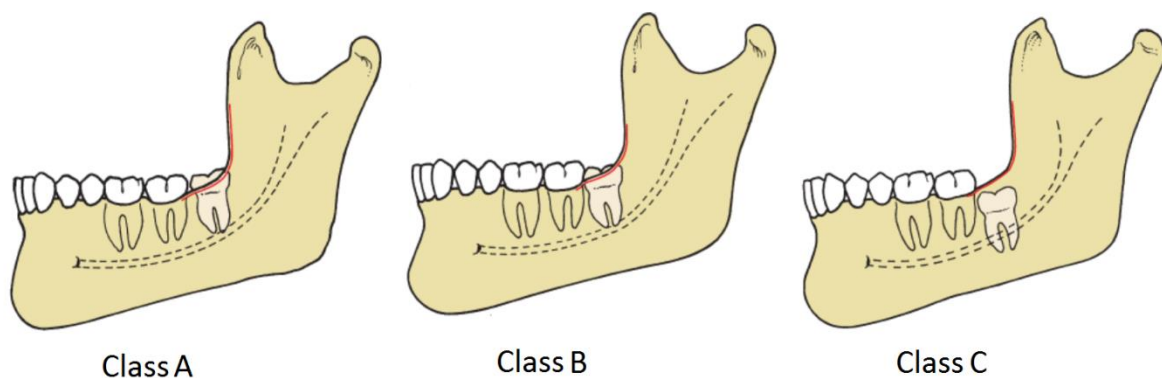


Figure 7 Relative depth of the 3rd molar to the adjacent tooth.

- Surgical removal of impacted third molars should be limited to patients with evidence of pathology. Such pathology includes:

- 1. Unrestorable caries.**

Partially erupted impacted teeth fail to have good contact with adjacent teeth; this will result in area that favours food stagnation. In addition this area will be inaccessible to routine oral hygiene practice.

- 2. Non-treatable pulpal and/or periapical pathology.**

- 3. Cellulitis, abscess and osteomyelitis.**

- 4. Internal/external resorption of the tooth or adjacent teeth.**

Due to persistent pressure of the developing 3rd molar, if in unfavourable angulation, the roots of the adjacent 2nd molar may undergo resorption. Following removal of the 3rd molar the root of the 2nd molar may be repaired by apposition of cementum. However, in some cases endodontic treatment is indicated.

- 5. Fracture of tooth.**

- 6. Disease of follicle including cyst/tumour.**

Fully impacted teeth have their follicle retained with them. The dental follicle, in most instances, maintains its size. However, in some cases the follicle may undergo cystic changes. The most common cysts associated with the impacted lower 3rd molar are dentigerous cyst and odontogenic keratocyst. In general if the radiographic size of the follicle is larger than 3mm, preliminary diagnosis of dentigerous cyst must be made.

Furthermore, odontogenic tumour may arise from the epithelium contained within the dental follicle. The most common odontogenic tumour in this region is Ameloblastoma.

- 7. Tooth/teeth impeding surgery or reconstructive jaw surgery.**

- 8. Tooth is involved in or within the field of tumour resection.**

- Specific attention is drawn to plaque formation and pericoronitis. Plaque formation is a risk factor but is not in itself an indication for surgery. The degree to which the severity or recurrence rate of pericoronitis should influence the decision for surgical removal of a third molar remains unclear. The evidence suggests that a first

episode of pericoronitis, unless particularly severe, should not be considered an indication for surgery. **Second or subsequent episodes should be considered the appropriate indication for surgery.**

Contraindications for removal of an impacted tooth:

Any surgical intervention should be weighted on a basis of Risk/Benefit ratio. Clearly, if the risks of the procedure outweigh the potential benefits, the surgery should not be done.

The following are contraindication of 3rd molar surgery:

1. Advanced Patient Age:

This is the most common contraindication for 3rd molar surgery. As the patient ages, the bone become less elastic, therefore more bone should be removed during surgery resulting in more surgical trauma. Old patient also require more post-operative recovery period.

For patients, older than 35 years old, having impacted asymptomatic teeth without periodontal diseases, caries, jeopardizing root of adjacent teeth or cystic changes. It's unlikely for them to have these sequelae later on in their life; therefore there will be no added potential benefits for them to undergo the surgery. The health care provider is advised to keep such patient under review for every 1-2 years. In this case, any complications will be detected early to allow delivery of proper treatment if needed.

2. Medically Compromised Patients:

Deterioration of patient medical condition usually occurs with the aging process. Regarding elective 3rd molar surgeries, the surgeon should consider leaving the impacted tooth in the alveolar process.

On the other hand, if the 3rd molar becomes symptomatic the surgeon should liaise with supervising physician. This will allow the physician to better control patient condition prior to surgery, allowing safer operative and post-operative period with minimal complications.

3. Expected damage to adjacent vital structures:

In some cases the 3rd molar may be positioned in such a way that damage to adjacent teeth, nerves or other vital structure is highly expected. In these circumstances, the surgeon would best evaluate the risk/benefit ratio before deciding to remove the impacted tooth.

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