SEMINAR ON

ASSESSMENT OF IMPACTED TOOTH

SUBMITTED BY:
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BDS FINAL YEAR

DEPARTMENT OF ORAL & MAXILLOFACIAL SURGERY
ASSESSMENT OF IMPACTED TEETH

IMPACTED TEETH (EMBEDDED TEETH)

➢ “An impacted tooth is that has failed to erupt completely or partially to its anatomical position in the dental arch due to obstruction from the adjacent tooth or bone or soft tissue beyond its chronological date”.

➢ The word impaction is derived from latin origin i.e. “impactus”.

➢ Impaction is cessation of eruption of a tooth caused by a physical barrier or ectopic positioning of a tooth.

➢ An impacted tooth is one that is erupted, partially erupted or unerupted and will not eventually assumes a normal arch relationship with the other teeth and tissues.

Fig. 10.2G(2): Multiple impacted teeth
ORDER OF FREQUENCY OF IMPACTED TEETH

1) Mandibular third molar.
2) Maxillary third molar.
3) Maxillary canine.
4) Mandibular premolar.
5) Maxillary premolar.
6) Mandibular canine
7) Maxillary central incisor.
8) Maxillary lateral incisor.

CLASSIFICATION OF IMPACTED MANDIBULAR THIRD MOLAR:

- PELL AND GREGORY CLASSIFICATION-

- Relationship of the impacted lower third molar to the ramus of the mandible and the second molar (based on the space available distal to the second molar).

Fig: Pell and Gregory classification.

Class I: Sufficient space available between the anterior border of the ascending ramus and the distal side of the second molar for the eruption of the third molar.
Class II: The space available between the anterior border of the ramus and the distal side of the second molar is less than the mesiodistal width of the crown of the third molar. It denotes that the distal portion of the third molar crown is covered by the bone from the ascending ramus.

Class III: The third molar is totally embedded in the bone from the ascending ramus because of absolute lack of space.

➤ GEORGE WINTER’S CLASSIFICATION -
A) Based on angulation:
According to the position of the third molar to the long axis of the second molar it can be of following types:
1) Mesioangular.
2) Horizontal or transverse.
3) Vertical.
4) Distoangular.
5) Buccoangular.
6) Linguoangular.
7) Inverted.

Fig. Impacted mandibular third molar. (a) mesioangular, (b) distoangular, (c) vertical, (d) horizontal, (e) buccoangular, (f) linguoangular, (g) inverted
B) Based on depth:
   As per the relationship to the occlusal surface of the adjoining
   second molar of the impacted maxillary or mandibular third molar,
   the depth can be judged.

1) POSITION A: The highest position of the tooth is on a level with or
   above the occlusal line.

2) POSITION B: Highest position is below the occlusal plane, but above
   the cervical level of the second molar.

3) POSITION C: Highest position of the tooth is below the cervical level of
   the second molar.

Fig: Classification of impacted mandibular third molars according to the
   depth of impaction.
CLASSIFICATION OF IMPACTED MAXILLARY THIRD MOLAR

- Angulation and depth classification is same as mandibular third molars.

Fig- impacted maxillary third molar. 1-mesioangular, 2-distoangular,
3- vertical, 4- horizontal, 5- buccoversion, 6- linguoversion, 7- inverted.

- BASED ON RELATION OF MAXILLARY THIRD MOLAR TO THE FLOOR OF MAXILLARY SINUS -

  A) Sinus approximation (SA)-No bone or a thin bony partition present between impacted maxillary third molar and the floor of the maxillary sinus.

  B) No sinus approximation (NSA)-2 mm or more bone is present between the sinus floor and the impacted maxillary third molar.
FIELD AND ACKERMANN CLASSIFICATION (1935) FOR IMPACTED CANINE

1) Labial or palatal placement of impacted maxillary canine.

2) Intermediate position.
   a) Crown between the lateral incisor and premolar.
   b) Crown above the root tip with labial or palatal orientation of the lateral incisor or premolar.

3) Aberrant position.
   Impacted maxillary canine lie in the maxillary sinus or nasal cavity

Fig- impacted maxillary canine. 1- palatally placed, 2- labially placed, 3- partially on the labial side & partly on palatal side, 4- canine locked between the roots of adjacent teeth, 5- canine in edentulous maxilla.
Classification:

1. Class I: Palatally placed maxillary canine.
   a) Horizontal.
   b) Vertical.
   c) Semi vertical.
2. Class II: Labially or buccally placed maxillary canine.
   a) Horizontal.
   b) Vertical.
   c) Semi vertical.
3. Class III: Involving both buccal and palatal bone, e.g. crown is placed on the palatal aspect and the root is towards the buccal alveolar process.
4. Class IV: Impacted in the alveolar process between the incisor and first premolar.
5. Class V: Impacted in the edentulous maxilla.
Impacted tooth is assessed by radiological examination.

### RADIOLOGICAL EXAMINATION

#### INTRA ORAL X-RAY

1) Intraoral periapical (IOPA)
2) Tube sift method
3) Occlusal films

#### EXTRA ORAL X-RAY

A) FOR MANDIBULAR TEETH
   1) OPG
   2) Lateral oblique view

B) FOR MAXILLARY TEETH
   1) OPG
   2) PA view water’s position

### INTRA ORAL X-RAY

- Intra oral x-rays are possible if -
  1) tooth is in the alveolus not in the ramus.
  2) oral opening is adequate.
  3) there is no gagging.

- Uses of intra oral x-ray -
  1) to study relationship with adjoining teeth.
  2) to study the configuration of the roots and status of the crown (caries, size etc.)
  3) to record the relationship with inferior alveolar canal.
- For bucco or linguoverision “tube shift” method should be used or occlusal film is taken.

- The position and depth of the tooth can be assessed by taking intra oral x-ray or even lateral extra oral x-ray and tracing can be done, which was originally advocated by George Winter.

**WINTER’S LINE:**

- This is also known as WAR line.
  
  W - WHITE LINE
  A - AMBER LINE
  R – RED LINE

- Three imaginary lines are drawn on the radiograph which is known as winter’s line.

Fig. winter's line: W-white line, A-amber line, R-red line.
A) White line:
   - it corresponds to the occlusal surface of first and second molar and second molar and is posteriorly over the third molar region.
   - it indicates the difference in occlusal level of second and third molars.

B) Amber line:
   - it represents the bone level.
   - the line is drawn from the crest of the interdental septum between the molars and extends posteriorly distal to third molar or to the ascending ramus.
   - this line denotes the alveolar bone covering the impacted tooth and the portion of tooth not covered by the bone.

C) Red line:
   - this line is drawn perpendicular from the amber line to an imaginary point of application of the elevator.
   - it indicates the amount of bone that will have to be removed before elevation i.e. the depth of the tooth in bone and the difficulty encountered in removing the tooth.

**Note:**
- If the length of the red line is more than 5 mm then the extraction is difficult.
- Every additional mm renders the removal of the impacted tooth 3 times more difficult (more than 9 mm-below the level of the
WHARFE ASSESSMENT

- It is done on OPG.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SCORE</th>
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<tbody>
<tr>
<td><strong>W - WAR Lines</strong></td>
<td></td>
</tr>
<tr>
<td>- Horizontal</td>
<td>2</td>
</tr>
<tr>
<td>- Distoangular</td>
<td>2</td>
</tr>
<tr>
<td>- Mesioangular</td>
<td>1</td>
</tr>
<tr>
<td>- Vertical</td>
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<tr>
<td><strong>H - height of mandible</strong></td>
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<tr>
<td>1-30 mm</td>
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<td>31-34 mm</td>
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<tr>
<td>35-39 mm</td>
<td>2</td>
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<td><strong>A - Angulation of mandible</strong></td>
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<tr>
<td>1° - 50° mm</td>
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<tr>
<td>60° - 69° mm</td>
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<tr>
<td>70° - 79° mm</td>
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<td><strong>R - Root formation</strong></td>
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<tr>
<td>- complex</td>
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<td>- favorable</td>
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<td>- unfavorable</td>
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</tr>
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<td>- normal</td>
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<td><strong>F - presence or absence of follicle</strong></td>
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<tr>
<td>- normal</td>
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<tr>
<td>- possibly enlarged</td>
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</table>
-enlarged 2

E - Exit pathway  
-space available 0  
-distal cusp covered 1  
-mesial cusp covered 2  
-both cusp covered 3

EXTRA ORAL X-RAY

A) FOR MANDIBULAR TOOTH:
✓ OPG
✓ Lateral oblique view mandible.

B) FOR MAXILLARY TOOTH:
✓ OPG
✓ PA view water’s position.

Fig. extra oral x-ray for detection of impacted teeth. OPG-lower right and upper left third molars are impacted.
INDICATIONS:

1) Patient with restricted oral opening or trismus or excessive gagging.

2) Impacted tooth in an aberrant position.

3) For ruling out associated pathology.

4) To study the relationship of the tooth to inferior alveolar nerve and inferior border. For maxillary teeth – relationship to the maxillary sinus.