Management of Impacted Teeth

Introduction

• Removal of impacted teeth is one of the most commonly performed surgical procedures by the OMFS.
• Requires extensive training, skill and experience to perform in atraumatic fashion

Impacted teeth

• Mandibular third molar most commonly impacted tooth
• 98% of impacted teeth are mandibular third molars
• Maxillary canines 1.3%
• Mandibular premolars and other teeth make up the remainder

Classification of impacted third molars

• Classified by position or direction of crown of impacted tooth
  – Mesioangular, distoangular, vertical, or horizontal
  – Pell and Gregory classification
    • Classifies impaction based on the tooth’s relationship to the anterior ramus and occlusal plane

Classification

• Pell and Gregory Classification
  – Relationship of tooth to anterior border of ramus
    • 1, 2, 3
  – Relationship of tooth to occlusal plane
    • A, B, C
Indications for removal of third molars
- Prevention or presence of periodontal disease
- Prevention or presence of dental caries
- Prevention or presence of soft tissue infection (pericoronitis or abscess)
- Prevention or presence of odontogenic cysts and tumors
- Facilitation of orthodontic treatment
- Impacted teeth under a dental prosthesis (relative indication)
- Preparation for head and neck radiation (for oral/head and neck cancer)

Additional considerations
- Data suggests that asymptomatic patients with a pocket depth around third molars greater than 5mm, have significantly increased levels of inflammatory mediators vs patients with pocket depths less than 5mm
  – White, R; et al. JOMS 60:1241-1245, 2002

Additional considerations
- Presence of periodontal disease is significantly associated with pre-term birth
  – Data from 1,020 obstetric patients
  – Results more significant if perio disease around third molars
  – Moss, K; et al. JOMS 64:652-658, 2006

Additional considerations
- Patients with visible third molars are more likely to have progression of periodontal disease than patients without third molars
  – Blakey, G; et al. JOMS 64:189-193, 2006
Additional considerations

Indications for Elective Therapeutic Third Molar Removal: The Evidence is In
Assael, L
JOMS 63:1691-1692, 2005
Editorial

Conclusions from recent evidence-based research
1. All third molars should be considered for removal in young adults in order to mitigate the risks of systemic inflammation and local progression of emerging periodontal disease
2. Patients who elect to retain their third molars need to be monitored for the progression of periodontal disease
3. Patients with retained third molars should be informed of research regarding

Preoperative Considerations

Determining Surgical Difficulty
Position of tooth
• Mesioangular impaction (45%) of all impacted mandibular 3rd molars and least difficult to remove.
• Vertical impaction (40%) and horizontal impaction (10%) are intermediate difficulty.
• Distoangular (5%) is the most difficult to extract.
Age of patient
Density of bone
Position of tooth in relation to other anatomic structures e.g.: IAN, Maxillary sinus
Cooperation of patient
Surgeon experience

Technique of Surgery

• Mucoperiosteal flap to gain adequate access to underlying bone and tooth.

• Remove bone around impacted tooth
  – Air-driven or electric hand piece with round or fissure burs
  – Chisel
  – For mandibular teeth, bone on the occlusal, buccal and distal aspects of impacted tooth is removed down to the cervical line. Advisable not to remove bone on lingual aspect due to likelihood of damage to lingual nerve.
• **Remove bone around impacted tooth**
  - For maxillary third molar, bone removal is done primarily on the lateral aspect of the tooth down to the cervical line to expose the crown.
  - Frequently, the bone is thin enough that it can be removed with a periosteal elevator or a chisel with hand pressure.

• **Tooth is sectioned so it can be delivered from the socket.**

• **Debridement of wound with curette and irrigation.** The more irrigation is used, the less likely the patient is to have a dry socket, delayed healing or other complications.

• **Incision is closed primarily**
Use of Antibiotics

- Exact incidence of postoperative infection is unknown. Incidence is probably 2% to 3%. Difficult to reduce infection rate less than 3% with use of prophylactic antibiotics. Therefore, it’s unnecessary to use prophylactic antibiotics in normal healthy individuals. There is essentially no report of the usefulness of prophylactic antibiotics in prevention of infection in third molar surgery.

Use of Steroids

- Corticosteroids help minimize swelling, trismus, and pain. Method of usage is variable and most effective method has yet to be clearly delineated.
- Initial IV dose at time of surgery has major clinical impact on swelling and trismus in the early postoperative period. If initial IV dose is not followed up with additional doses, the advantage disappears by the second or third post op day. Maximum control of swelling requires additional steroids given for 1 – 2 days following surgery.

Complications

**Bleeding**

- Use good surgical technique, minimize trauma, avoid tears of flaps.
- Most effective measure to achieve hemostasis is via moist gauze pressure over wound.
- Application of topical thrombin on Gelfoam into socket and oversuturing.
- Other hemostatics: oxidized cellulose (Oxycel or Surgicel), microfibriller collagen (Avitene).
- Patients with acquired or congenital coagulopathy may need blood product replacement.

**Edema**

- Use of corticosteroids.
- Ice – may be comforting but has little effect on size of swelling.
- Swelling reaches maximum by end of second post op day and resolved by 5th to 7th day.

**Trismus**

- Use of corticosteroids.
- Minimal flap reflection
- Careful placement of mouth prop
- Length of surgery
- Reaches maximum by second post op day and resolved by end of first week.

**Pain**

- Usually reaches maximum during first 12 to 24 hours postoperatively.
- NSAIDs before surgery may or may not be beneficial in controlling post operative pain.
- Most important determinant of amount of post op pain is the length of operation. There is a strong correlation between post op pain and trismus.
Complications

Infection

- Incidence between 2-3%
- 50% are localized subperiosteal abscess which occur 2-4 weeks after a previously uneventful post op course. Usually attributed to debris under the flap. Treated with I&D and debridement and antibiotics.
- Infections during the first post operative week occurs in less than 1% of cases

Complications

Displacement of tooth/root

- Root fragment may be displaced into the submandibular space, sublingual space, inferior alveolar canal or maxillary sinus.
- Leaving small fragment of uninfected root has been shown to remain in place without post operative complications. Pulpal tissue undergoes fibrosis and the root becomes incorporated within the alveolar bone.

Displacement of tooth/root

- Displacement of maxillary third molar
  - Usually into maxillary sinus or infratemporal fossa.
  - Management:
    - Infratemporal fossa: Manipulate tooth back into socket with finger pressure placed high in the buccal vestibule near the pterygoid plates. If unsuccessful, attempt retrieval with suction tip into socket and posterior. If unsuccessful, allow tooth to undergo fibrosis and return 2-4 weeks later to remove. If tooth is totally asymptomatic, consider leaving the tooth in place. Three dimensional localization of tooth should be made before surgery to recover tooth.

- Maxillary Sinus: retrieval usually through Caldwell-Luc approach. Localization of tooth should be made before procedure.
Complications

Alveolar Osteitis (Dry Socket)
- Incidence between 3% and 25%. Variation due to vague definition.
- Incidence appears higher in smokers and females taking oral contraceptives.
- Pathogenesis not absolutely defined but most likely result of lysis of fully formed blood clot before the clot is replaced with granulation tissue.
- This fibrinolysis occurs during the 3rd – 4th post op day. Agents may be from tissue, saliva or bacteria.

Complications

Nerve Disturbance
- IAN can be injured during root manipulation and elevation
- Lingual nerve can be injured by elevating a lingual flap or by perforating the lingual bony plate during sectioning of the tooth. Pinching the lingual tissues with a forcep can also cause lingual nerve injury

Complications

Nerve Disturbance
- IAN:
  - Most common predisposing factor is depth of impaction
  - Mesioangular or vertical impaction
  - Radiographic signs of third molar intimately associated with the canal (diversion in path of canal, darkening of apical end of root indicating root involvement in the canal, interruption of radioopaque line of inferior alveolar canal)
  - Precautionary measures:
    - Remove more bone
    - Sectioning tooth

Complications

Nerve Disturbance
- Lingual Nerve:

Fig. 3a-b, a and b a. Frontal view of the left third molar region showing the mean horizontal and vertical distances of the lingual nerve from the lingual plate and alveolar crest. b. The lingual nerve has been identified, traced downward from adjacent soft tissues, and terminated by a 1/4 inch diameter mandibular third molar surgery procedure. (From Kierrebuck JF, and Cahanellin JD. Clinical and anatomic considerations on the relationship of the lingual nerve to the mandibular third molar region. J Oral Maxillofac Surg 41:353, 1984.)
Complications

Mandible fracture

• Rare
• Deeply impacted third molar in older individual with dense bone
• Use of excessive pressure with elevators
• Should perform immediate reduction and fixation of fracture.