Surgery of the Frontal Sinus

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Disclosures

- Co-author patent application regarding “Sinusitis diagnostics and treatments”
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Outline

- Case-based approach
- Demonstrate the utility of both endoscopic and open approaches to the frontal sinus

Challenges of Frontal Sinus Surgery

- Variable Underlying Anatomy
- Critical Neighboring Structures
  - Skull Base
  - Orbit
- Difficult Surgical Angle
Approaches to the Frontal Sinus

- Leave It Alone
- Endoscopic Frontal Sinusotomy
- Modified Lothrop Procedure (Frontal Drill-out)
- External Sinus Preservation Techniques (Trephination, Sewall-Boyden)
- Frontal Sinus Obliteration & Cranialization

Endoscopic Frontal Sinusotomy

- Most common procedure for the frontal sinus
  - Frontal sinusitis
- Keys to successful frontal sinusotomy
  - Clear understanding of the underlying anatomy for each individual case
  - Minimize trauma to the frontal recess mucosa
Frontal Recess Dissection

- Study Imaging in 3 Planes
  - Identify Relationship of Frontal Drainage Pathway to Agger Nasi Cells, Uncinate, and Bulla
  - Saggital images most helpful
- Complete Ethmoidectomy
- Palpation and Image Guidance

Case #1

29 y/o man with left nasal obstruction
Case #2

33 y/o man with right frontal headaches
Case #2
Case #2
Case #3

17 y/o with Pfeiffer syndrome s/p fronto-orbital advancement with “soft spot” on forehead
Case #3
Endoscopic Frontal Sinusotomy

- Limitations
  - Access to Lateral Regions of the Frontal Sinus
  - Constrained by the Patient’s Anatomy
  - Risk for Postoperative Scarring/Stenosis
Endoscopic Modified Lothrop Procedure

- Involves removal of the floor of the frontal sinuses, the intersinus septum, and the superior nasal septum
- Increased lateral access (trans-septal access)
- Creation of larger sinusotomy at the expense of increased mucosal trauma

Endoscopic Modified Lothrop Procedure - Indications

- Refractory Chronic Frontal Sinusitis
  - Scarring/osteoneogenesis of the frontal recess
  - Polyps
- Neoplastic Disorders
  - Inverted papilloma of the frontal sinus
  - As part of a larger skull base approach
Endoscopic Modified Lothrop Procedure

Key Considerations
- AP diameter of the frontal recess (axial CT)
- Ability to identify one frontal recess

Case #4
Inverted Papilloma of the Frontal Sinus
Case #4
Case #5

57 y/o man with Samter’s Triad
Endoscopic Lothrop Procedure

- Disadvantages
  - Difficult in patients with narrow A/P dimension of the frontal recess
    - May have limited lateral exposure
  - Creates significant mucosal trauma
  - Increased risk of CSF leak (approx 1%)
  - Technically more challenging
  - Requires special instrumentation

Frontal Trephination

- Can be combined with endoscopic frontal sinusotomy
  - Above and below technique
- Medial Brow Incision
- Removal of the floor of the frontal sinus allows access for an endoscope and working instrument
Case #6

83 y/o woman with lateral frontal mucocele
Trephination Above and Below Approach

- Disadvantages
  - Somewhat restricted intraoperative access
  - Very restricted postoperative access
  - External scar
  - Temporary diplopia in some patients

Bicoronal Osteoplastic Flap

62 y/o man with proptosis
Frontoethmoid Osteoma

Case #
Frontoethmoid Osteoma

Frontoethmoid Osteoma
Frontoethmoid Osteoma
Frontoethmoid Osteoma
Balloon Sinus Dilation - Technique

- Insertion of guide wire through an endoscopically placed guide catheter
- Confirmation of placement through transillumination
Balloon Sinus Dilation
Balloon Sinus Dilation

Balloon Sinuplasty - Technique

- Balloon catheter placed over guide wire
- Balloon inflated
- Sinus may be suctioned/irrigated
Approaches to the Frontal Sinus

- No Exploration
  - Balloon Sinus Dilation
- Endoscopic Frontal Sinusotomy
- Modified Lothrop Procedure (Frontal Drill-out)
- External Sinus Preservation Techniques (Trephination, Sewall-Boyden)
- Frontal Sinus Obliteration & Cranialization

THE END