Surgery of the Frontal Sinus

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Disclosures

- None

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

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

Frontal Recess Dissection

- Study Imaging in 3 Planes
  - Identify Relationship of Frontal Drainage Pathway to Agger Nasi Cells, Uncinate, and Bulla
  - Sagittal images most helpful

29 y/o man with left nasal obstruction
Endoscopic Frontal Sinusotomy

33 y/o man with right frontal headaches
Endoscopic Frontal Sinusotomy

17 y/o with Pfeiffer syndrome s/p fronto-orbital advancement with “soft spot” on forehead
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
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

Inverted Papilloma of the Frontal Sinus
Frontal Sinus Inverted Papilloma

57 y/o man with Aspirin Sensitivity 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

83 y/o woman with lateral frontal mucocele
Lateral Frontal Mucocele

Trephination
- Disadvantages
  - Somewhat restricted intraoperative access
  - Very restricted postoperative access
  - External scar
  - Temporary diplopia in some patients
  - Risk of frontal numbness

Bicoronal Osteoplastic Flap
62 y/o man with proptosis
Balloon Sinus Dilation

- Found a single randomized, controlled trial comparing a “hybrid” procedure to endoscopic frontal sinusotomy
- Abstract at AAOHNS meeting 2010, manuscript (not peer reviewed) provided for evaluation

- Conclude that “there is no convincing evidence supporting the use of endoscopic balloon sinus ostial dilation compared to conventional surgical modalities...”
- Khalil et al 2006 Cochrane review found no evidence for the efficacy of endoscopic sinus surgery over medical management
Balloon Sinuplasty

Approaches to the Frontal Sinus
- No Exploration
- Balloon Sinus Dilation
- Endoscopic Frontal Sinusotomy
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- External Sinus Preservation Techniques (Trephination, Sewall-Boyden)
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THANK YOU