COMPLICATIONS IN ENDOSCOPIC SINUS SURGERY

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Disclosures

» None
Complications in ESS

- Complications happen
- Full informed consent preoperatively
- Surgeon needs to be able to:
  - Avoid
  - Recognize
  - Treat to resolve or minimize morbidity
- Full disclosure to patient postoperatively
- Litigation can be avoided by informed consent and addressing complication
TYPES OF COMPLICATIONS

- Unexpected
  - Result of inadvertent injury to normal structures

- Preventable
  - Result of poor patient selection, inappropriate surgery, or poor technique
Unexpected Complications

- **Hemorrhage**
  - Anterior ethmoid artery
  - Sphenopalatine artery
  - Internal Carotid artery

- **Orbital violation**
  - Orbital fat exposure
  - Preseptal hemorrhage
  - Orbital hematoma
  - Extraocular muscle injury, entrapment

- **Skull Base injury**
  - CSF leak
  - Pneumocephalus
  - Meningoencephalocele
Hemorrhage
Anterior ethmoid artery

In skull base

Mesentary in ethmoids
ICA Injury
What to Do

- Pray
- Immediate nasal packing to tamponade bleeding
- Maintain adequate blood pressure
- Emergent transport to interventional neuroradiology for arteriogram and embolization of the ICA
- ICU monitoring for evidence of stroke
Orbital Complications
Orbital Injury
Preoperative Assessment
Orbital Violation
Preoperative Assessment
Orbital Violation
Preseptal hemorrhage
Orbital Hematoma
Orbital Hematoma
Lateral Canthotomy and Cantholysis
Orbital Hematoma
Lateral Canthotomy and Cantholysis
Endoscopic Orbital Decompression
Orbital Hemorrhage
Medical management

- Mannitol 20%, 2 g/kg over 20 minutes
- Acetozolamide 500 mg bolus
- Timolol - 1 drop
- Iopidine (apraclonidine, alpha-2 antagonist) - 1 drop
Orbital Subperiosteal Abscess after Irrigation of Frontal Sinus
Medial Rectus Muscle Injury

- Violation of periorbita and orbital fat
- Likely a microdebrider injury
- Mechanism
  - Take bite out of muscle
  - Impale medial rectus muscle directly or by fragment of bone
  - Fibrosis of muscle
Extraocular Muscle Injury
Extraocular Muscle Injury
Medial Rectus Transection
Forced Duction Test
Tips to Prevent Extraocular Muscle Injury

- If lamina papyracea exposed or injured do not manipulate further
- Do not manipulate orbital fat
- When using the microdebrider point the open part of the blade away from the lamina papyracea
- Do not penetrate the maxillary sinus ostium until an opening can be visualized
Skull Base Injury
Skull Base Injury

- Incidence
  - Should be <1% risk of CSF leak for ESS

- Treatment
  - If during surgery, immediate repair with mucosal graft with/without bone graft
Skull Base Injury

- Danger Areas
  - Lateral lamella of the cribiform plate
  - Middle turbinate attachment
  - Posterior ethmoid roof
  - Entering sphenoid too high
  - Frontal recess
  - Too posterior when entering frontal sinus
Recognition of Skull Base Injury

- Washout sign (clean area in a blood-stained field)
- Bone violation
- Excessive bleeding at skull base
Preoperative disease severity at sites of subsequent skull base defects after endoscopic sinus surgery.


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Amount of Disease at Subsequent Skull Base Defect Site

- No Disease: 63%
- Minimal Disease: 29%
- Complete Opacification: 8%
Case 1

Baseline                    Pre-repair
Risk of SB Injury

Thickness of non-diseased tissue

- Minimal mucosal disease
  - Thin mucosa
  - Strips more easily
    - Possibly exposing skull base

- Thin, non-osteitic bone
  - More easily damaged
  - Provides less resistance to manipulation
  - More transparent
    - Mistaken for another ethmoid cell
**Pneumocephalus**

- Presents postoperatively after a forceful activity
  - Sneeze, cough, strain, vomit
- Headache
- Mental status change
Preventable Complications
Poor Judgement or Technique
Complications
Poor patient and procedure choice
Complications
Synechiae

➢ Result of:
  ✓ Mucosal trauma
  ✓ Middle turbinate destabilization
  ✓ Inadequate access

➢ Solution:
  ✓ Atraumatic technique
  ✓ Mucosal preservation
  ✓ Middle turbinate medialization
Frontal Mucocele from Middle Turbinate Lateralization
Conclusions

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THANK YOU