



EMORY HEALTHCARE

***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

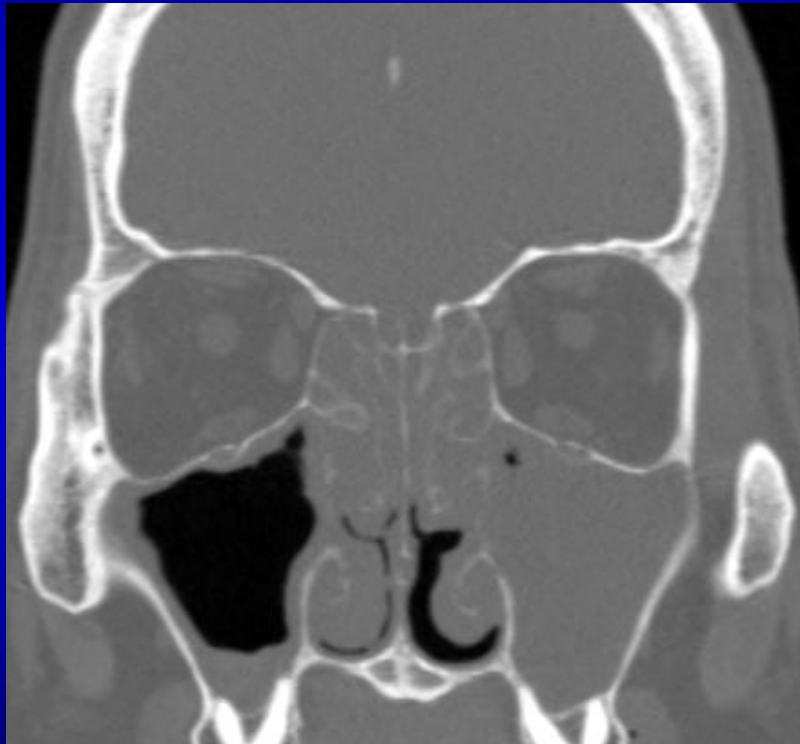


Unexpected Complications

- 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



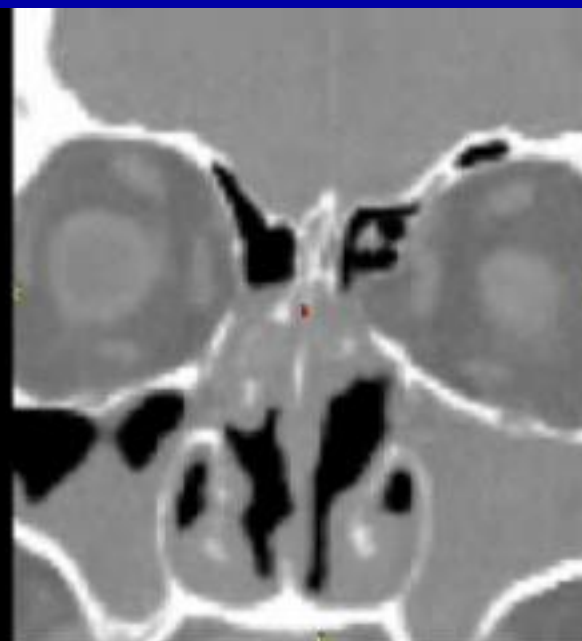
Orbital Complications

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Orbital Injury

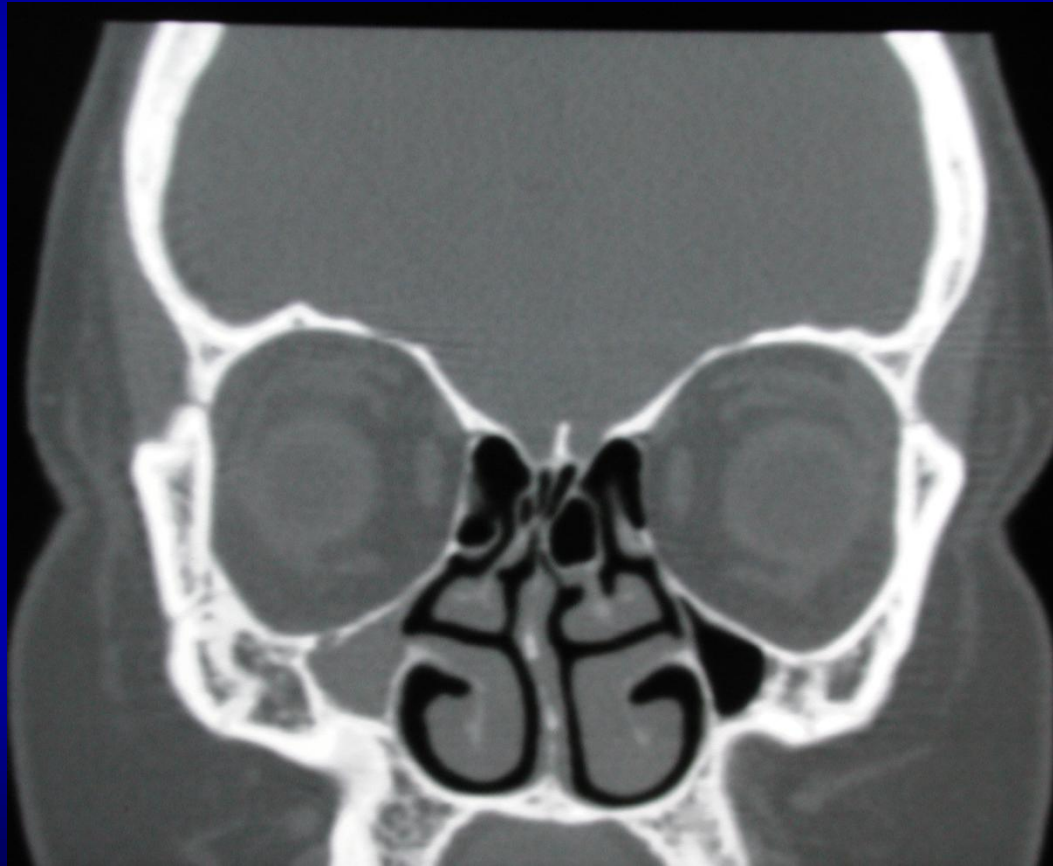
Preoperative Assessment





Orbital Violation

Preoperative Assessment





Orbital Violation Preseptal hemorrhage





Orbital Hematoma



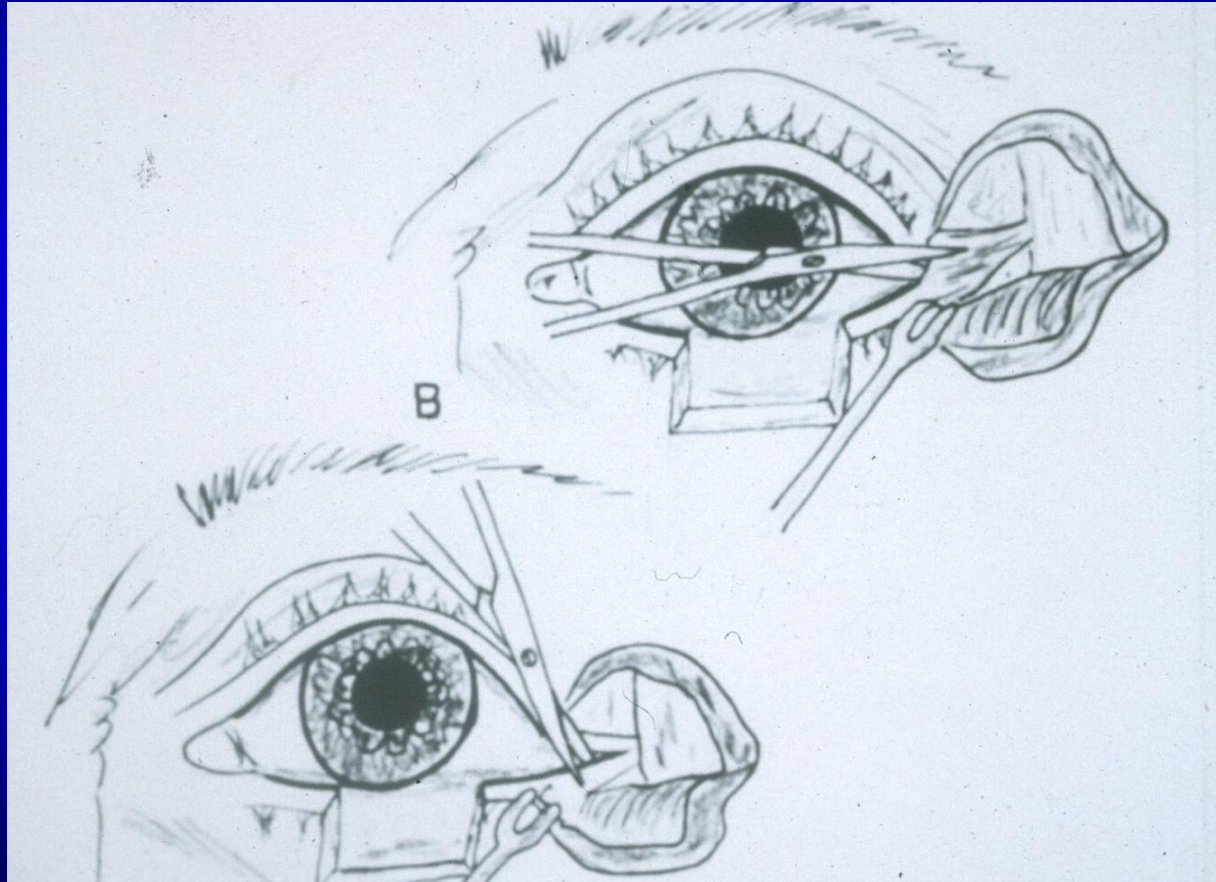


Orbital Hematoma



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Lateral Canthotomy and Cantholysis



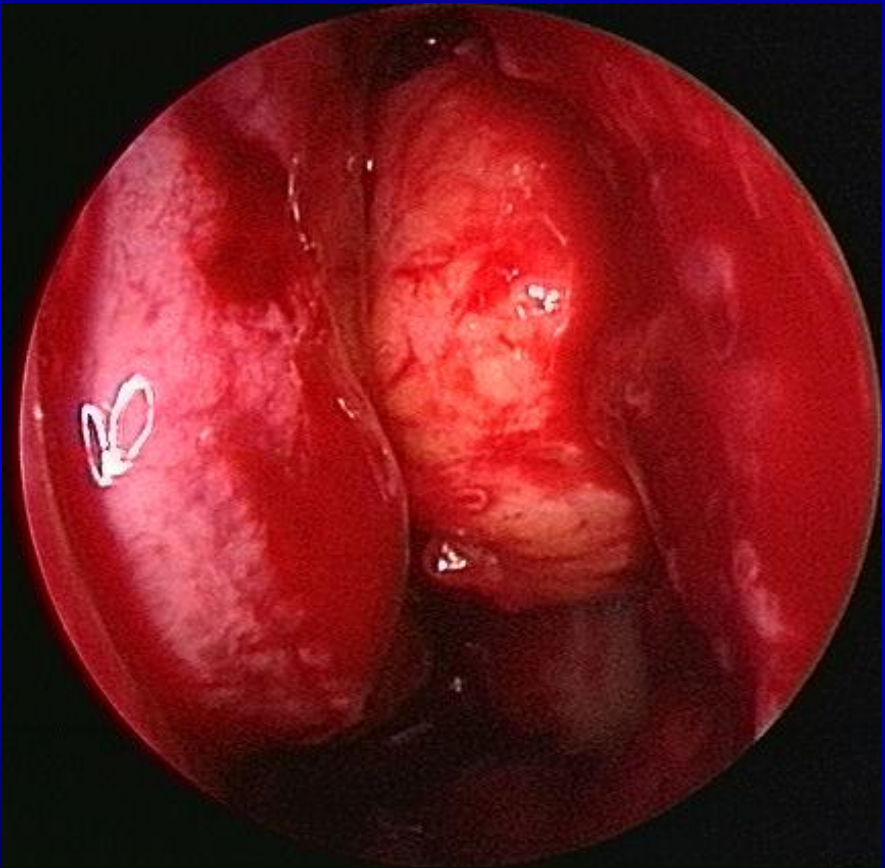
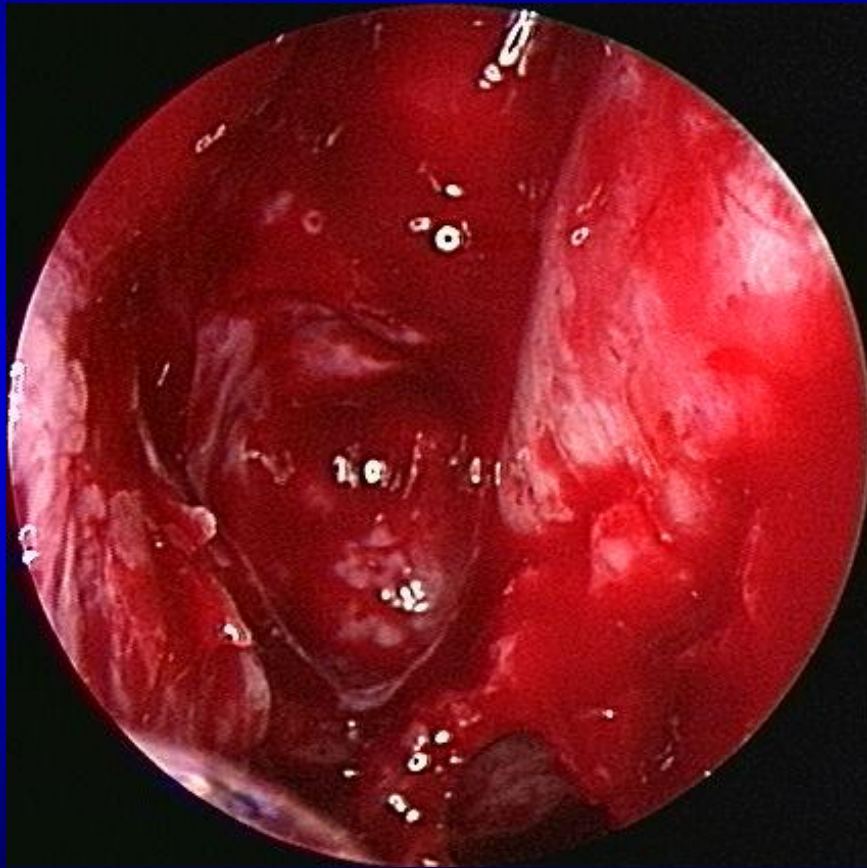


Orbital Hematoma Lateral Canthotomy and Cantholysis





Endoscopic Orbital Decompression





Orbital Hemorrhage

Medical management

- Mannitol 20%, 2 g/kg over 20 minutes
- Acetazolamide 500 mg bolus
- Timolol- 1 drop
- Iopidine (apraclonidine, alpha-2 antagonist- 1 drop



Orbital Subperiosteal Abscess after Irrigation of Frontal Sinus



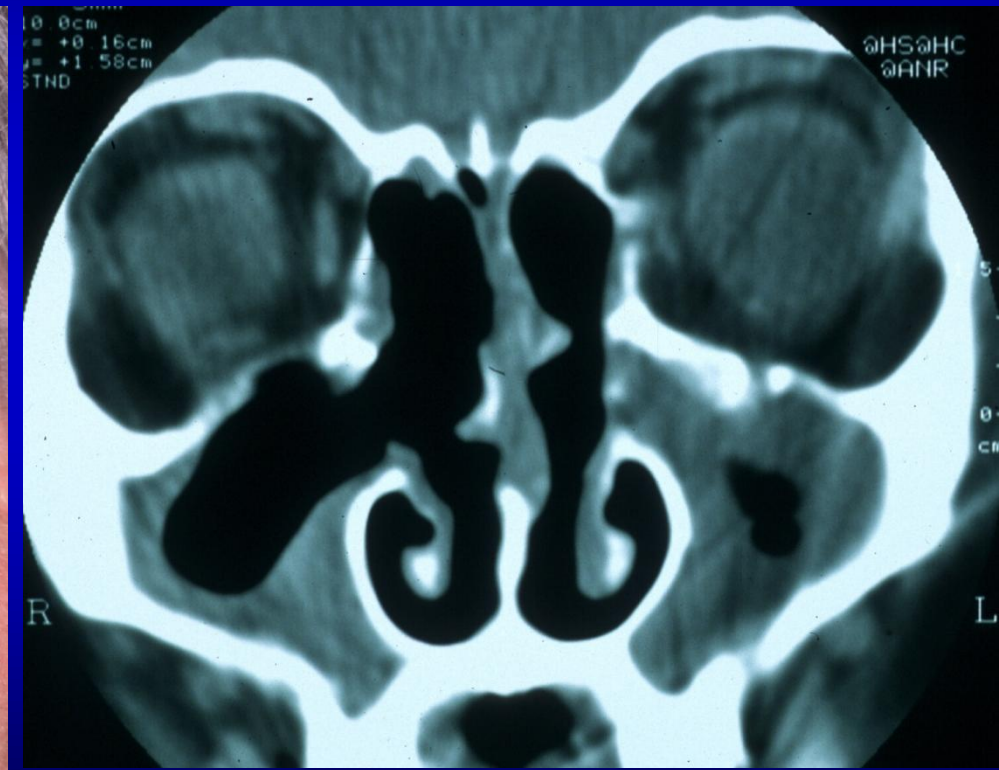


Medial Rectus Muscle Injury

- 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

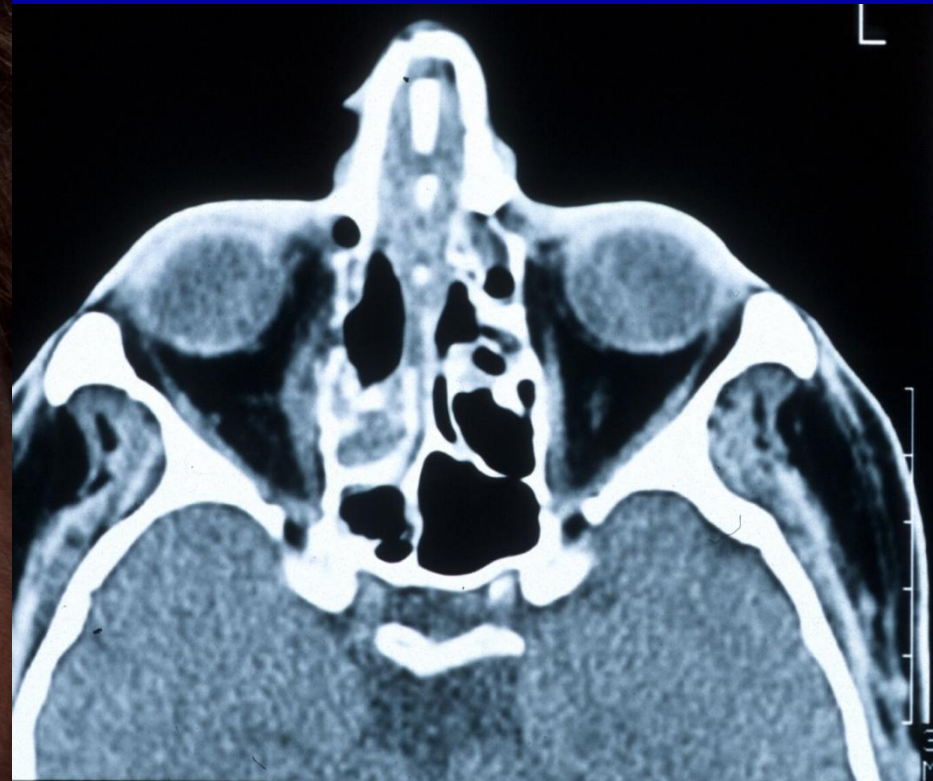


Extraocular Muscle Injury





Extraocular Muscle Injury





Medial Rectus Transection



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Forced Duction Test



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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

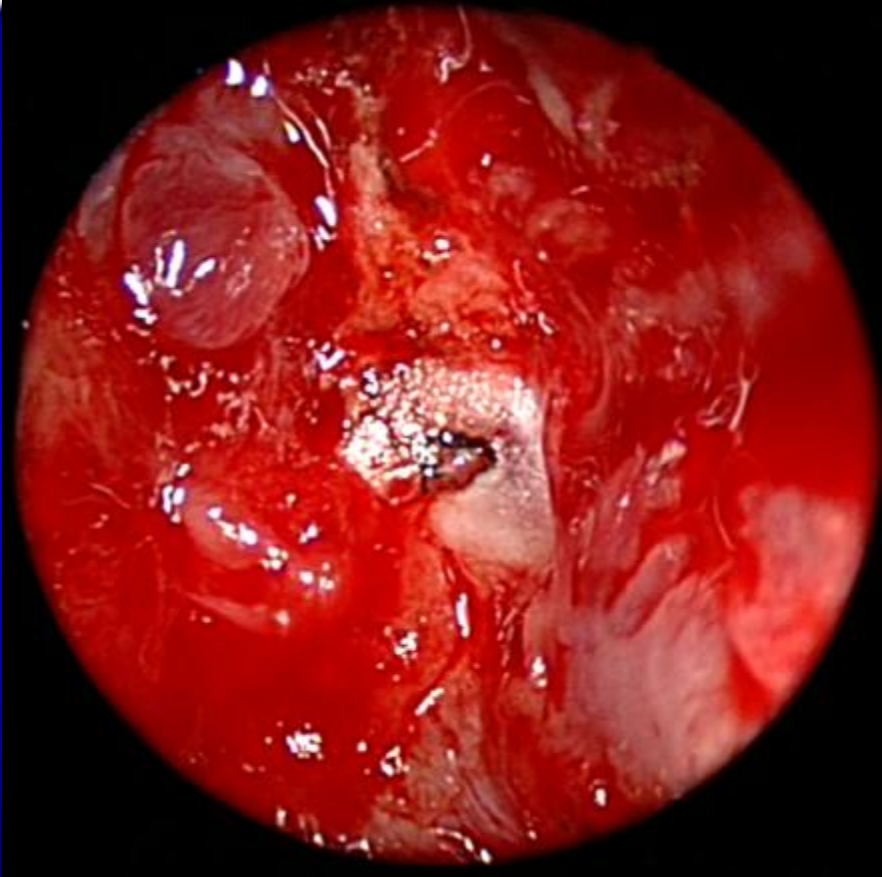
- **Danger Areas**
 - ✓ Lateral lamella of the cribriform plate
 - ❖ Middle turbinate attachment
 - ✓ Posterior ethmoid roof
 - ❖ Entering sphenoid too high
 - ✓ Frontal recess
 - ❖ Too posterior when entering frontal sinus







Recognition of Skull Base Injury

- Washout sign (clean area in a blood-stained field)
- Bone violation
- Excessive bleeding at skull base





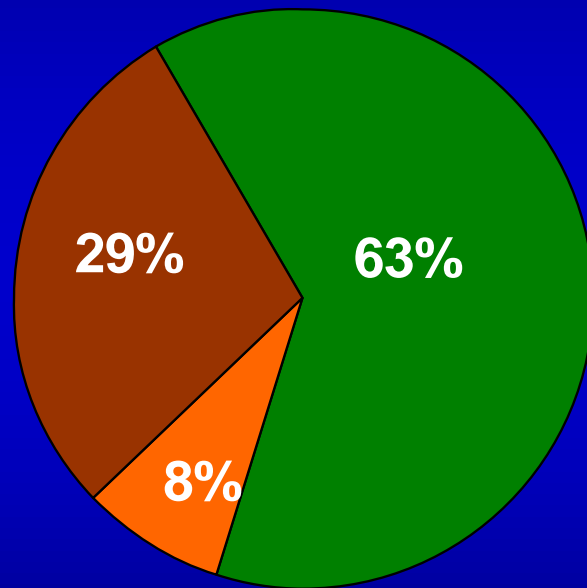
Preoperative disease severity at sites of
subsequent skull base defects after
endoscopic sinus surgery.
Amer J Rhinol 2008;22:321-24.

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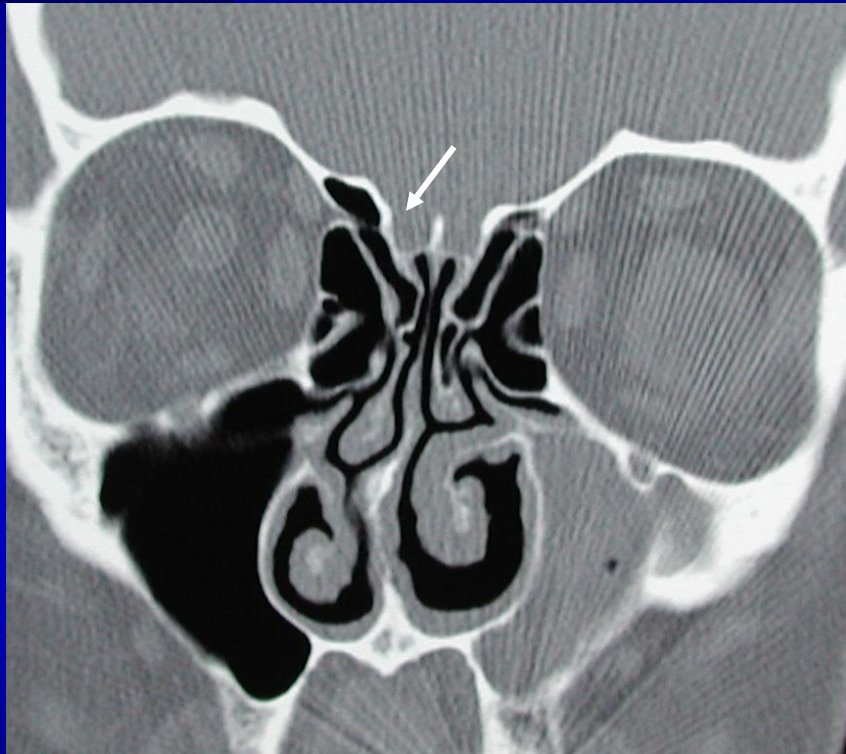
Amount of Disease at Subsequent Skull Base Defect Site



- No Disease
- Minimal Disease
- Complete Opacification



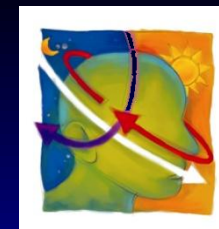
Case 1



Baseline



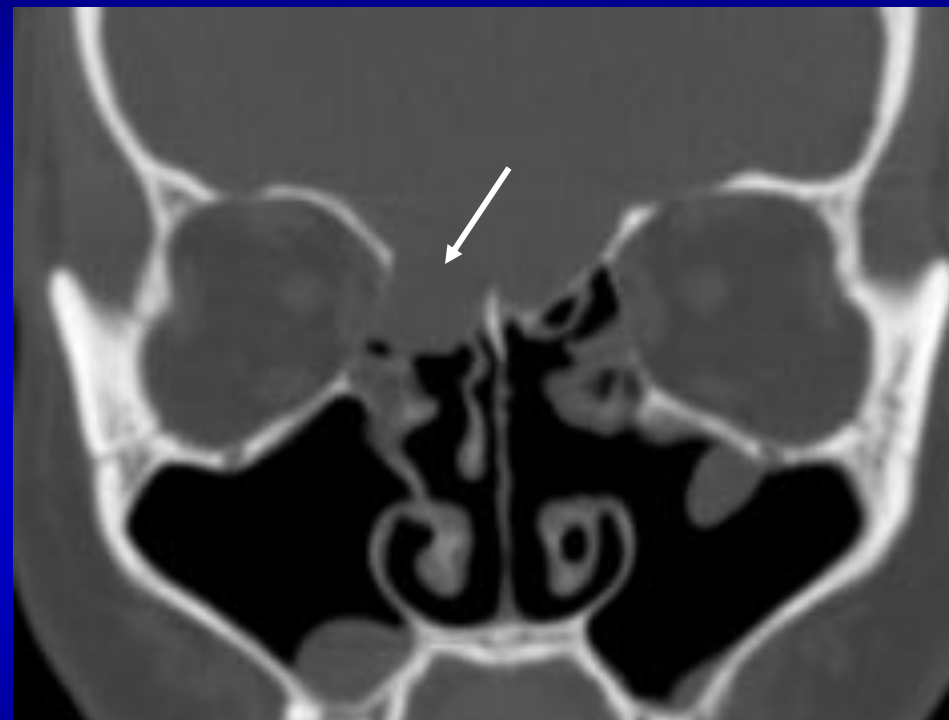
Pre-repair



Case 2



Baseline



Pre-repair



Risk of SB Injury

Thickness of non-diseased tissue

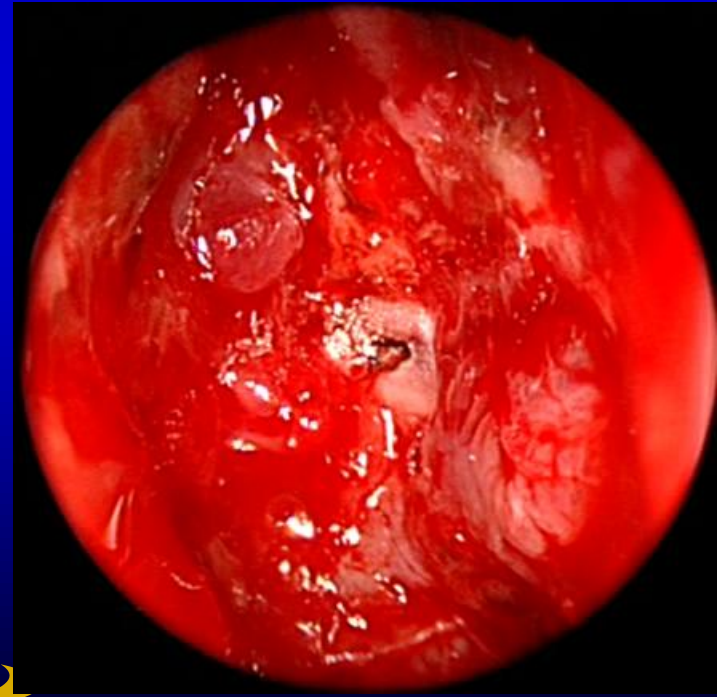
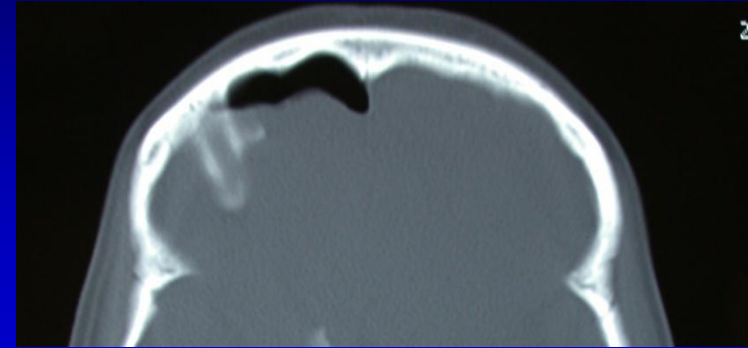
- Minimal mucosal disease
 - ✓ Thin mucosa
 - ✓ Strips more easily
 - ❖ Possibly exposing skull base

- 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



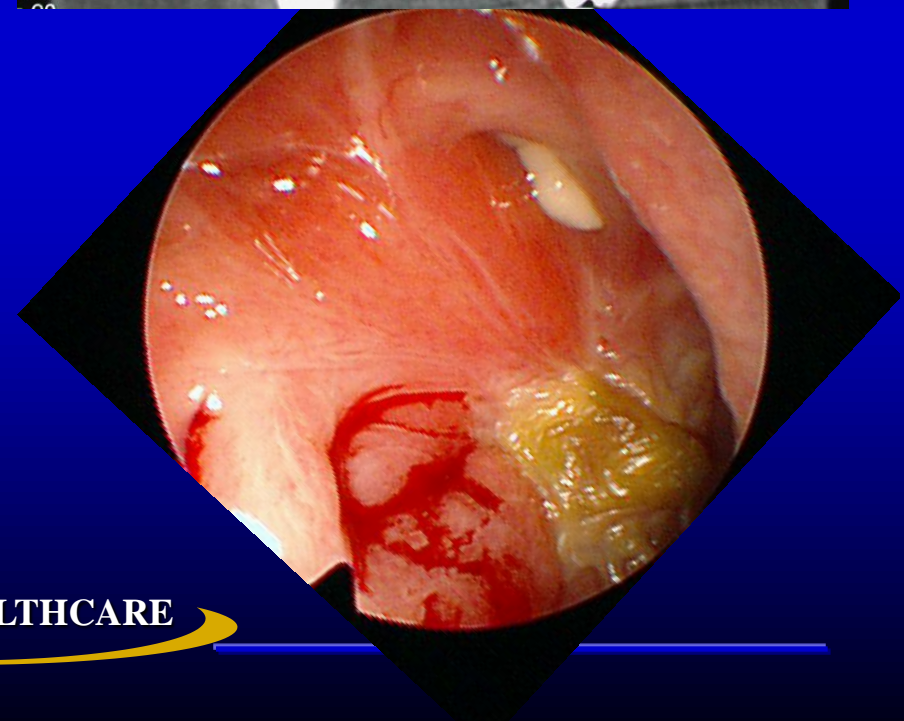
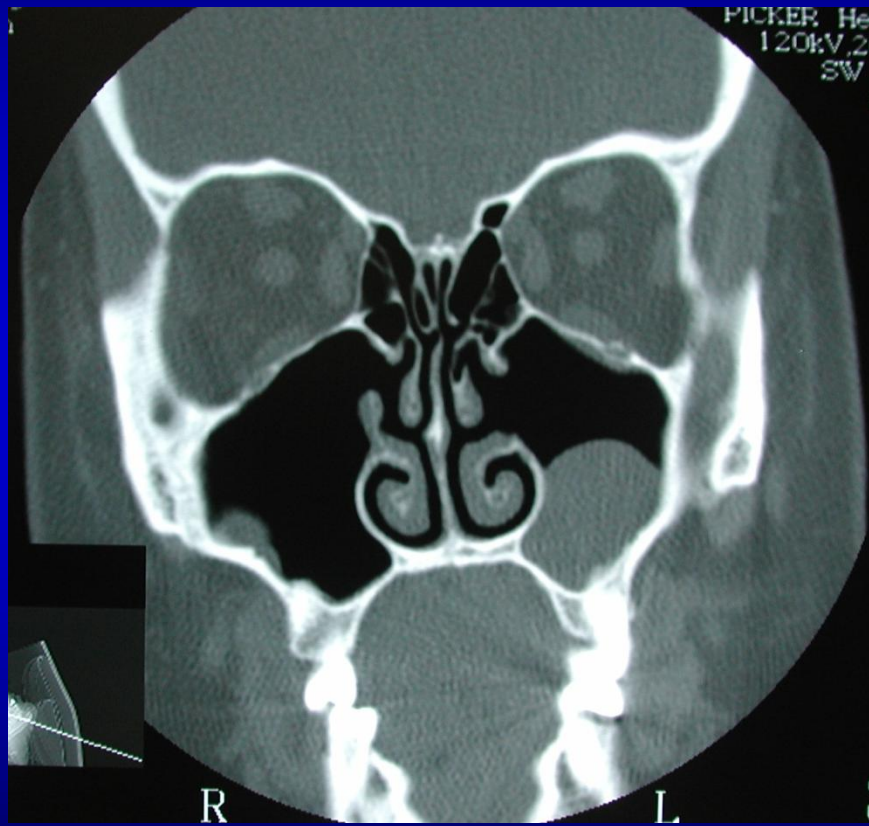


Preventable Complications
Poor Judgement or Technique



Complications

Poor patient and procedure choice

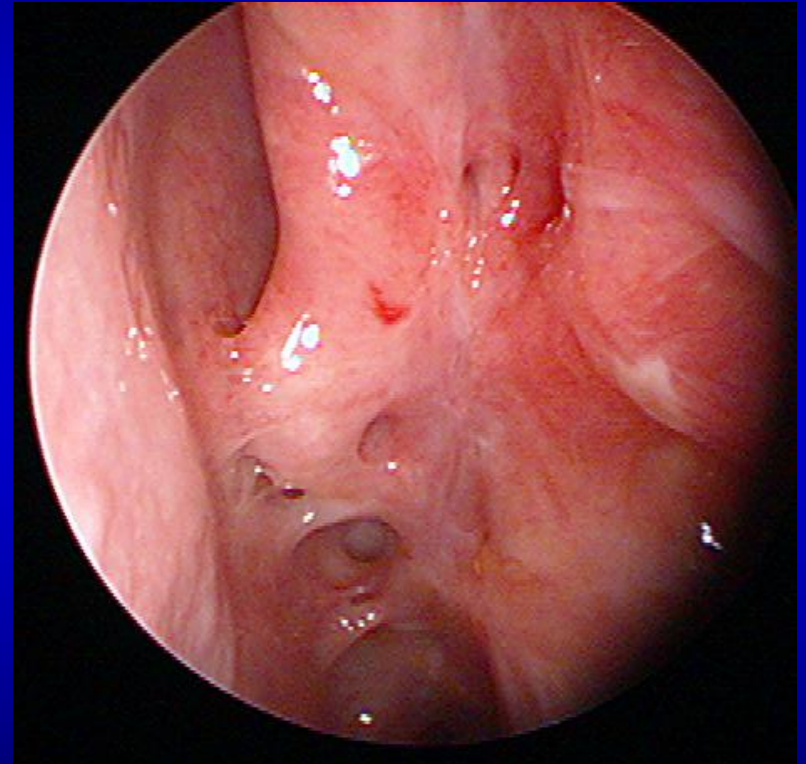




Complications

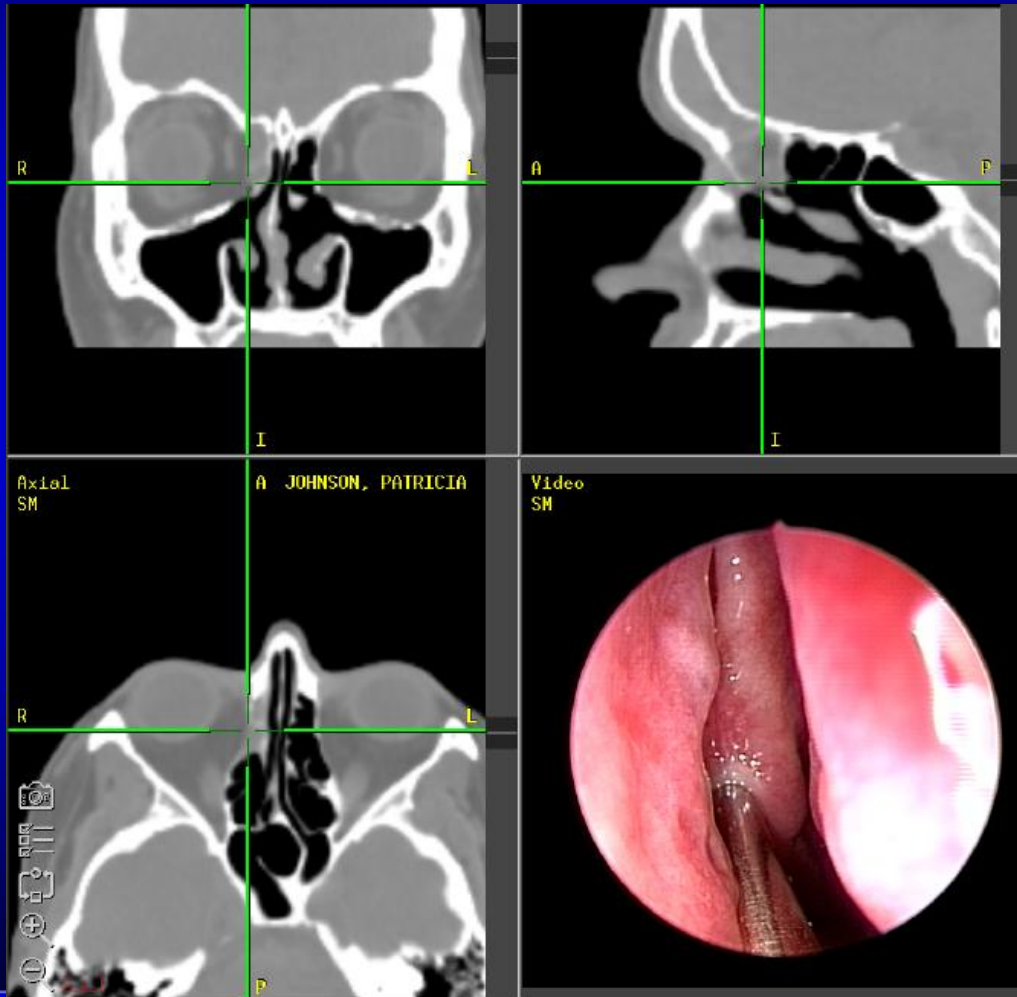
Synechia

- Result of:
 - ✓ Mucosal trauma
 - ✓ Middle turbinate destabilization
 - ✓ Inadequate access
- Solution:
 - ✓ Atraumatic technique
 - ✓ Mucosal preservation
 - ✓ Middle turbinate medialization





Frontal Mucocele from Middle Turbinate Lateralization





Conclusions

- Complications happen
- Surgeon needs to be able to:
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THANK YOU

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