




Cerebrospinal Fluid leaks


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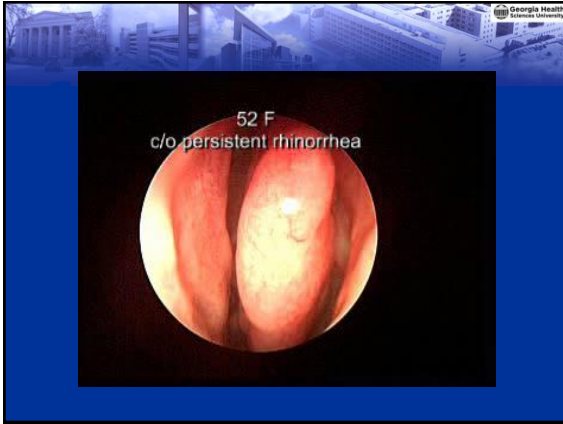




- **DISCLAIMER**
- No medications available that have an FDA indication for CRS
- All medications and any medical management described in this lecture are OFF LABEL




- **Presentation-Diagnosis**
 - Watery rhinorrhea
 - Reproduced by leaning forward or Valsava (Tandy test)
 - Distinguish from rhinitis
 - Beta (Tau)-transferrin: highly specific for human CSF
 - Only need a small amount of fluid: <1cc
 - No special handling (refrigeration)



GHSU-MCG protocol

- Endoscopy in the office
- Intrathecal Iohexol (Omnipaque 300, Withrop Pharmaceuticals, New York, NY)
- Intrathecal Fluorescein
- CT cysternogram
- Return for endoscopy same day
- Use fluorescent ophthalmology light

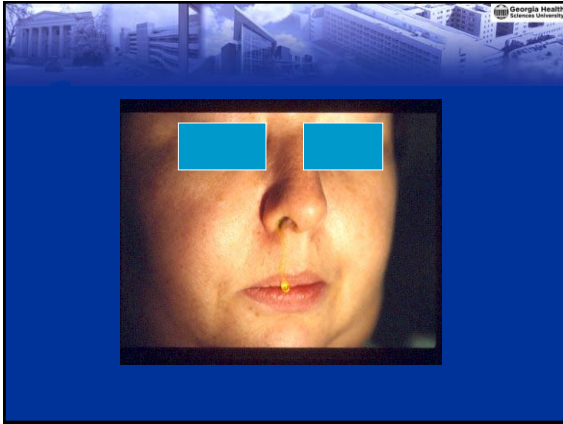


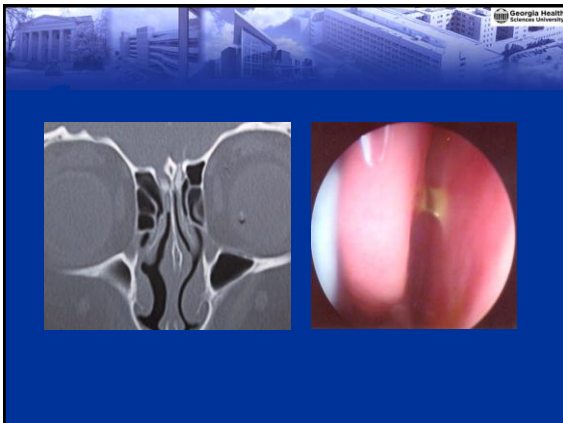
This slide details the GHSU-MCG protocol for the procedure. It includes a list of steps: endoscopy in the office, intrathecal Iohexol (Omnipaque 300, Withrop Pharmaceuticals, New York, NY), intrathecal Fluorescein, CT cysternogram, return for endoscopy same day, and use of fluorescent ophthalmology light. An axial CT scan of the skull base is included to show the anatomical structures involved.

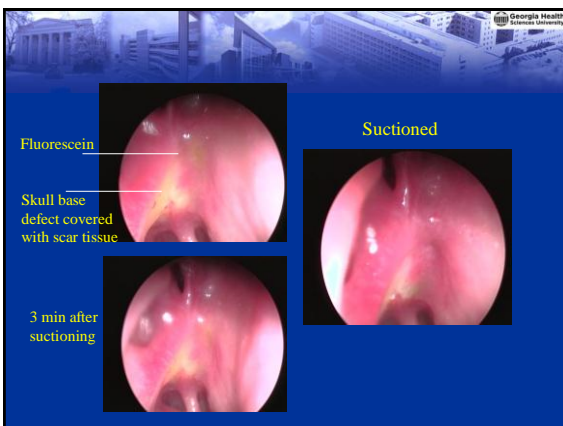
Fluorescein protocol

- Lumbar drain
- Fluorescein 10%, dilute down to 1%. Mix 1 cc with 10 cc CSF (Final concentration $\leq 0.1\%$) and very slowly inject
- Trendelenberg
- Dye should leak from defect in 20-60 min

This slide details the Fluorescein protocol. It includes a list of steps: lumbar drain, fluorescein 10% diluted down to 1% (mix 1 cc with 10 cc CSF, final concentration $\leq 0.1\%$) and very slowly inject, Trendelenberg, and dye should leak from defect in 20-60 min.







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- Management
- Conservative – trauma patients (acute setting)
 - Reclined sitting, no straining, avoid constipation, no bending over, avoid coughing, sneezing, nose blowing
 - Lumbar CSF decompression
 - Steroids, diuretics: controversial (ICP patients)
 - Prophylactic antibiotics: controversial

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- Management
- Surgical indications
 - Failure of cons management
 - Persistent leak
 - Recurrent meningitis
 - Pneumocephalus
 - Intraoperative CSF leak – repair in same setting

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Small defect
Skull base

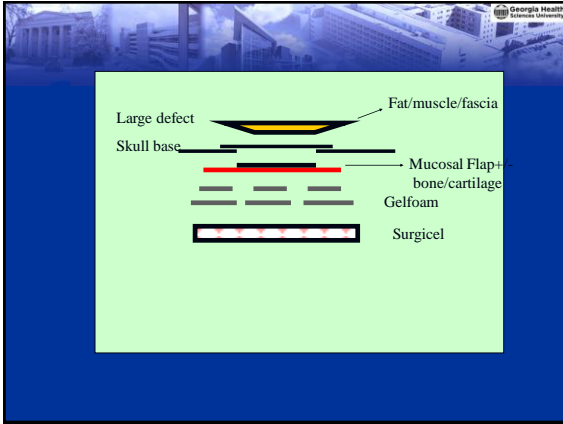
Fat

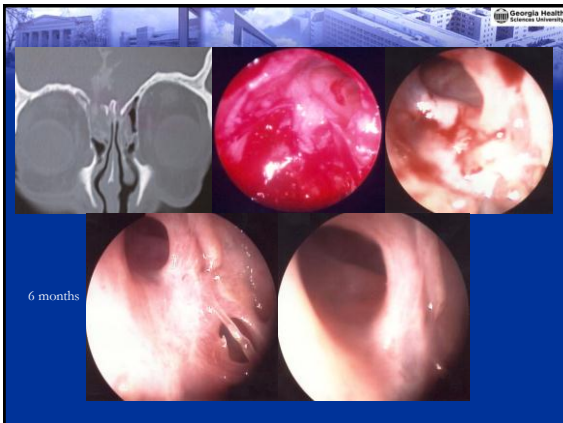
Mucosal Flap

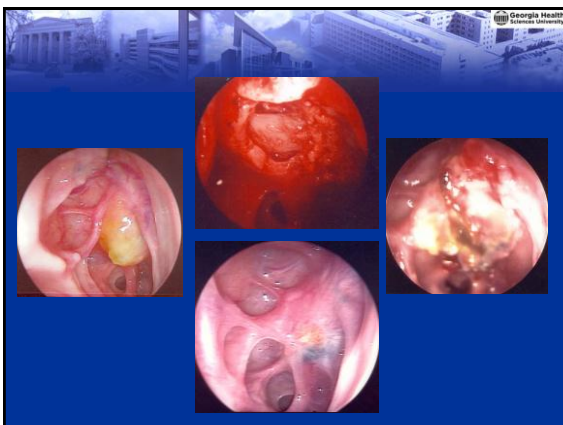
Gelfoam

Surgicel

The diagram illustrates a cross-section of a skull base repair. It shows a 'Small defect' in the 'Skull base' (represented by a black line). Above the defect is a layer of 'Fat' (yellow). Below the defect is a 'Mucosal Flap' (red line). Underneath the mucosal flap is a layer of 'Gelfoam' (dashed lines). At the bottom is a layer of 'Surgicel' (black line with red stars).

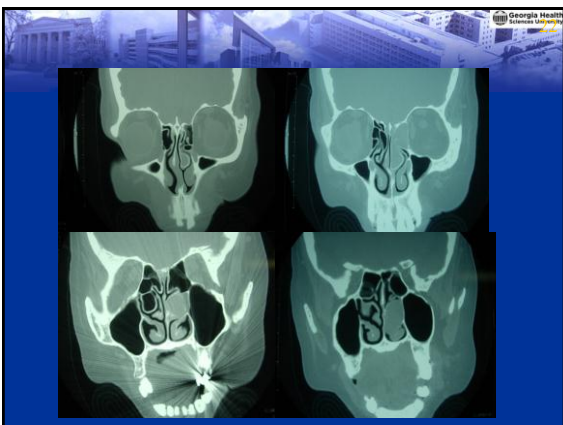


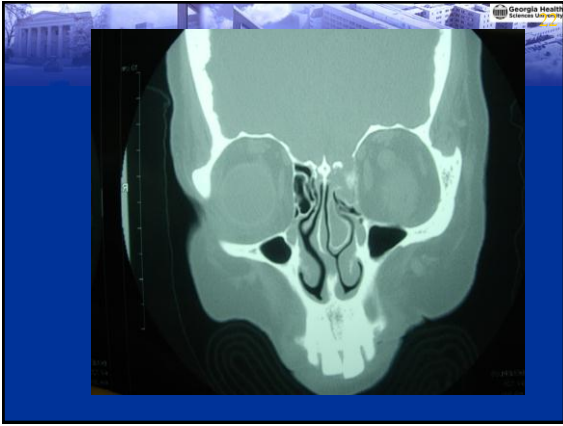


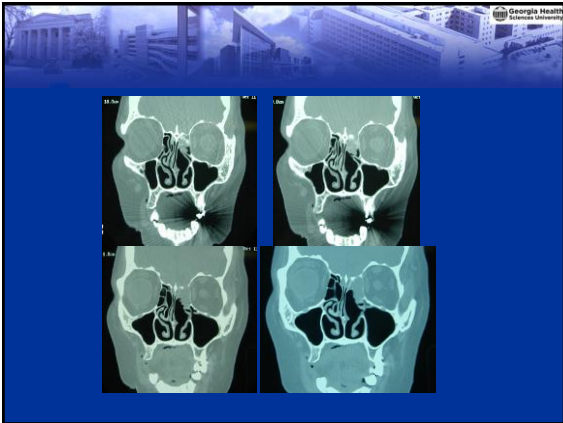




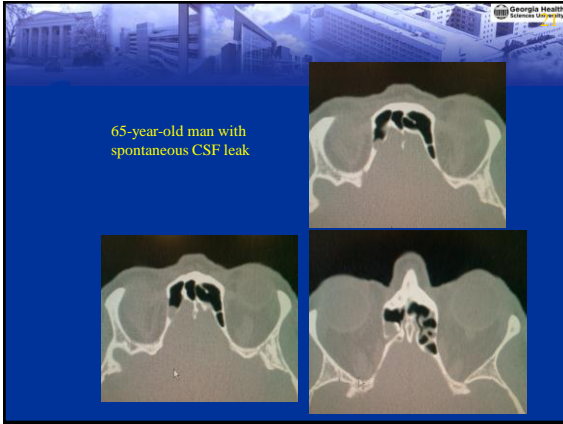














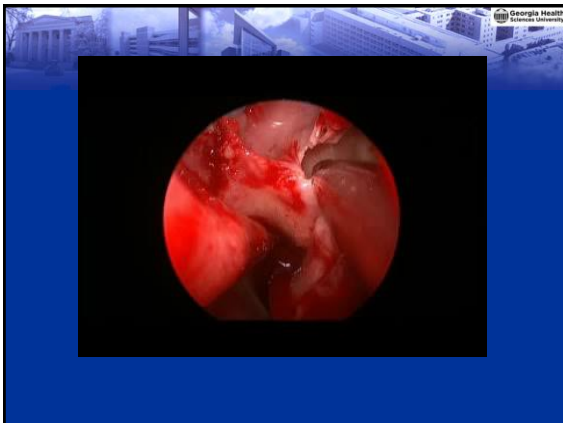












Postoperative management

- Lumbar drain x 2-3 days only in ICP patients
- Bed rest with HOB elevated x 24 hours
- Discharge 1-2 days if no lumbar drain
- Avoid exertion
- Stool softeners
- Antibiotics
- Normal saline
- Endoscopic debridement over one month

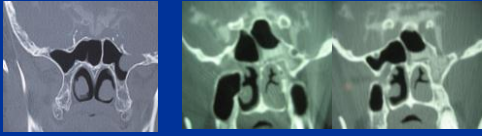
Success rates: upper 90s

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This slide is titled 'Postoperative management' and lists several key points for patient care after surgery. The points include lumbar drain use, bed rest with head of bed elevation, discharge criteria, and various medical interventions like stool softeners, antibiotics, and saline. It also notes success rates of over 90% and the need for endoscopic debridement. The slide includes the Georgia Health Sciences University logo.

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- Skull base defects with increased ICP
- Schlosser and Bolger
 - ICP (Lumbar drain) < 25 cm: low salt diet/diurectics
 - ICP > 35 cm or multiple defects: consider shunting
 - Weight loss



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Thank you!
