



Cerebrospinal Fluid leaks


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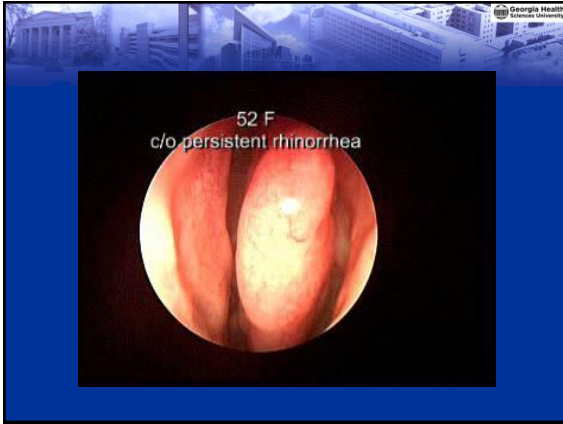




- **DISCLAIMER**
- No medications available that have an FDA indication for CRS
- All medications and any medical management described in this lecture are OFF LABEL




- **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

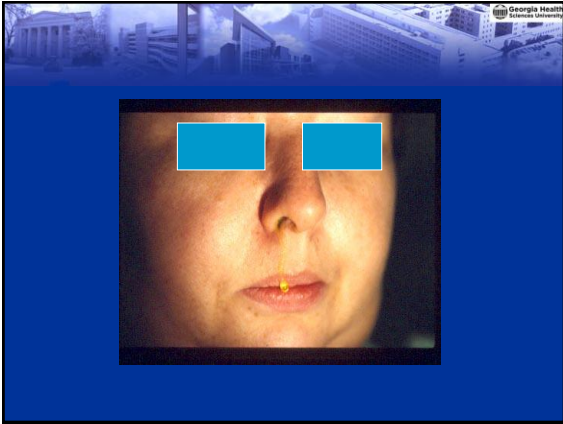


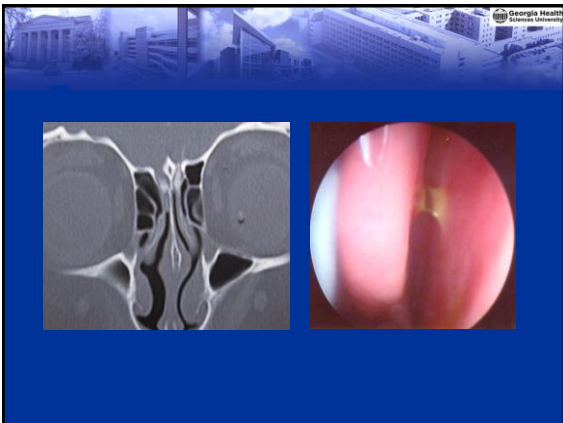
This slide details the GHSU-MCG protocol for diagnosing CSF leaks. It includes a list of steps: endoscopy in the office, intrathecal Iohexol (Omnipaque 300), intrathecal fluorescein, CT cysternogram, return for endoscopy the same day, and use of fluorescent ophthalmology light. An axial CT scan of the skull base is shown to the right of the list.

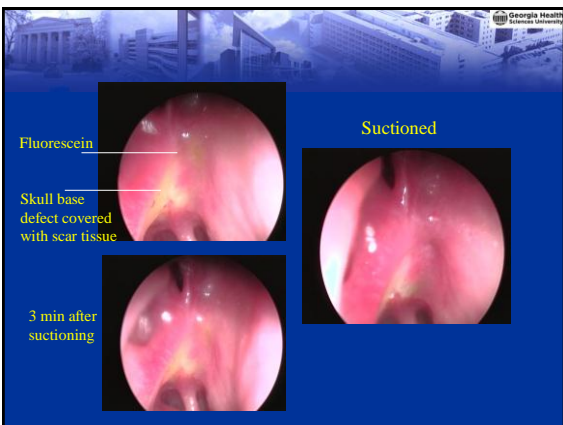
Fluorescein protocol

- 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 to 1% (mix 1 cc with 10 cc CSF, final concentration $\leq 0.1\%$), very slowly inject, Trendelenberg position, and dye should leak from defect in 20-60 minutes.






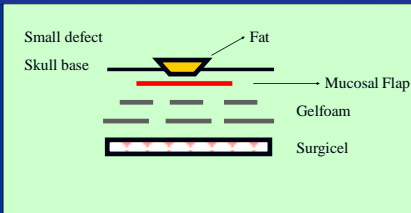




- Management
- Conservative – trauma patients (acute setting)
 - Reclined sitting, no straining, avoid constipation, no bending over; avoid coughing, sneezing, nose blowing
 - Lumbar CSF decompression
 - Steroids, diuretics: controversial (ICP patients)
 - Prophylactic antibiotics: controversial



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

Small defect

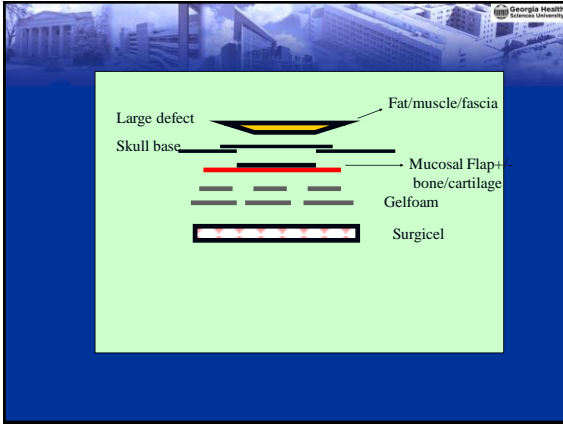
Skull base

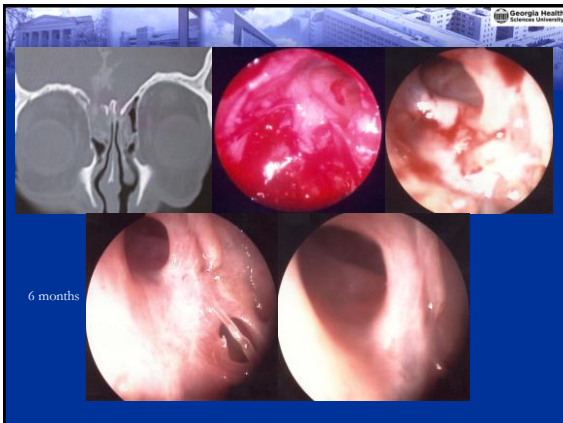
Fat

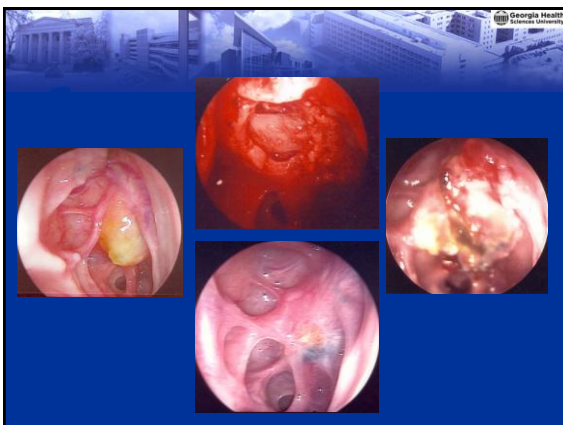
Mucosal Flap

Gelfoam

Surgicel

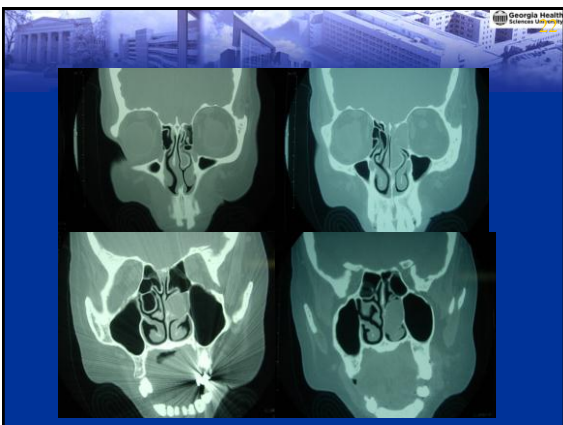


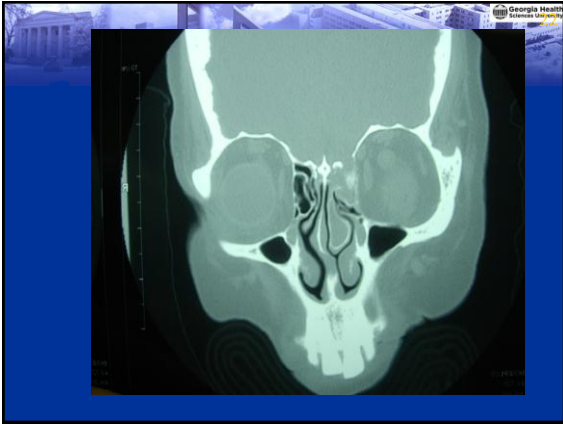


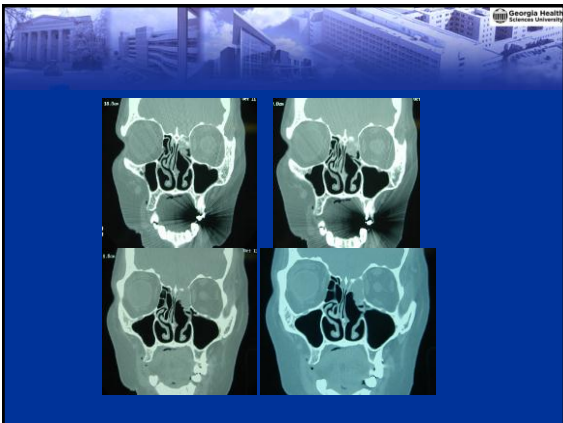




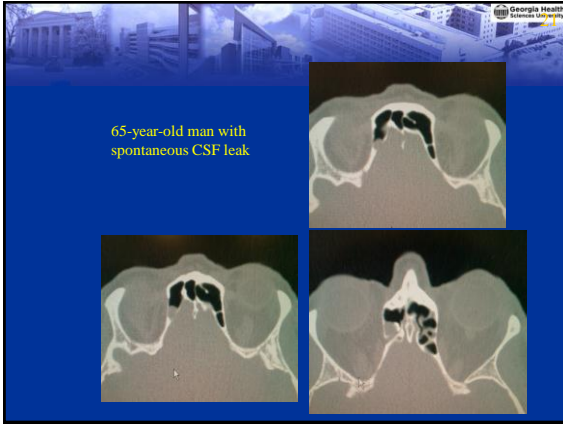






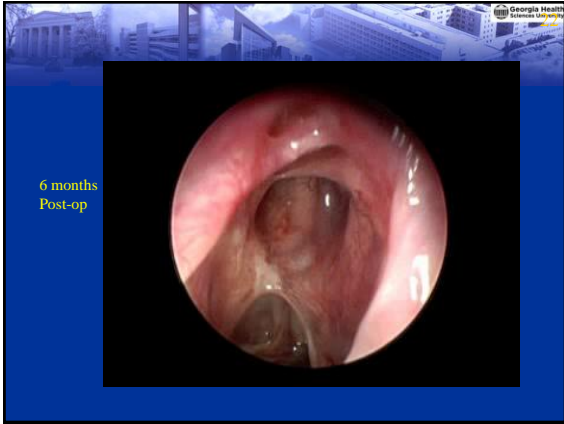


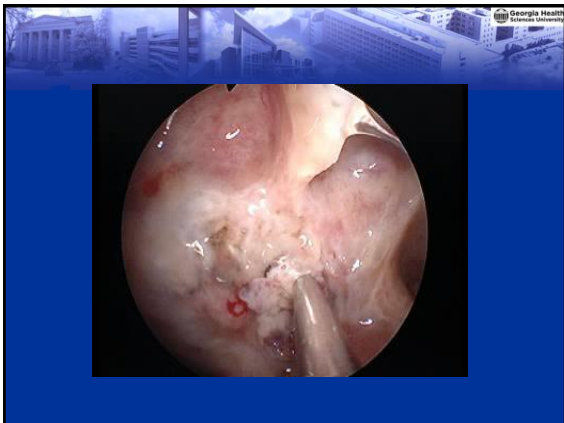






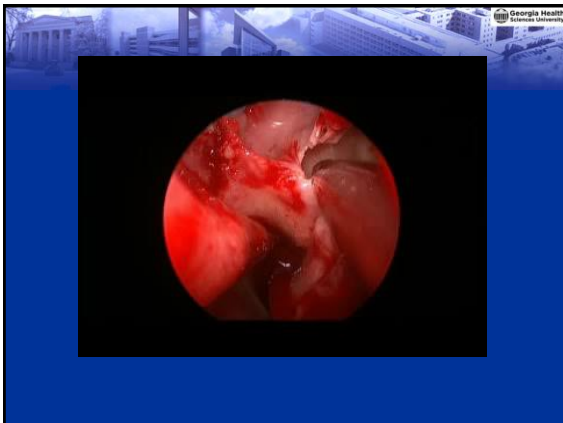












Postoperative management

- 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

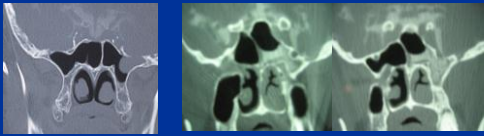
Success rates: upper 90s

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This slide is titled 'Postoperative management' and lists seven bullet points: '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', and 'Normal saline'. It also includes the text 'Endoscopic debridement over one month' and 'Success rates: upper 90s'. The Georgia Health Sciences University logo is in the top right corner.

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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!
