

Lateral orbitotomy in a pediatric patient for a complex CSF leak via superior orbital fissure and foramen rotundum following delayed failure of expanded endoscopic endonasal transpterygoid repair

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Clinical background

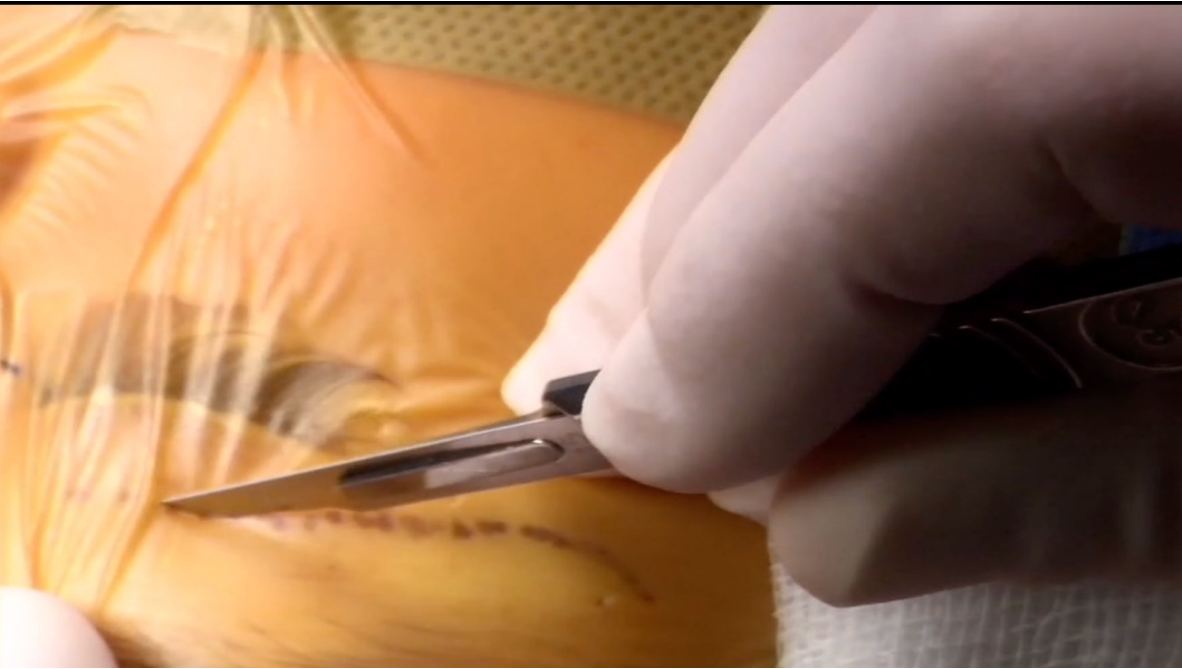
- 3-year-old female; previously fit and well
- Initially presented with recurrent chest infections and intense persistent cough (subsequently being diagnosed with chronic bronchiolitis obliterans)
 - CSF rhinorrhea one month later
 - Persistent episodes of wheeze and respiratory tract infections necessitating PICU admission and intubation
 - Patient considered candidate for lung transplant
- Initial CT and MRI failed to show the site of leak
- Examination under general anesthesia with intrathecal fluorescein
 - Site of leak not obvious
- CT cisternogram showed leak predominantly from the right Superior Orbital Fissure (SOF) and potentially in the perimaxillary nerve area (Foramen Rotundum, FR) (Fig 1A)
- Expanded endoscopic endonasal (EEA) and right sided transpterygoid approach with vidian nerve sacrifice and CSF leak repair with nasoseptal flap
- Normal postoperative cisternogram
- Recurrence of leak 14 months later leading to planned open lateral transorbital repair (Fig 1B)

Rationale for procedure

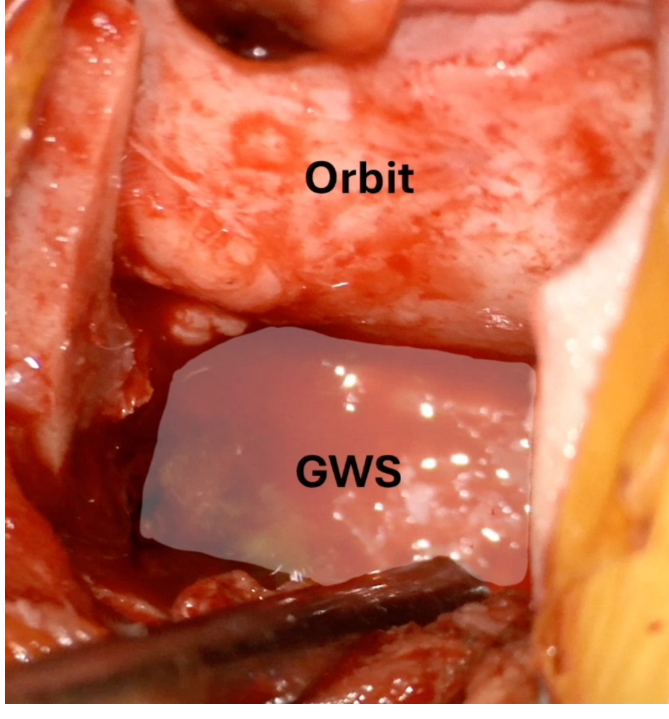
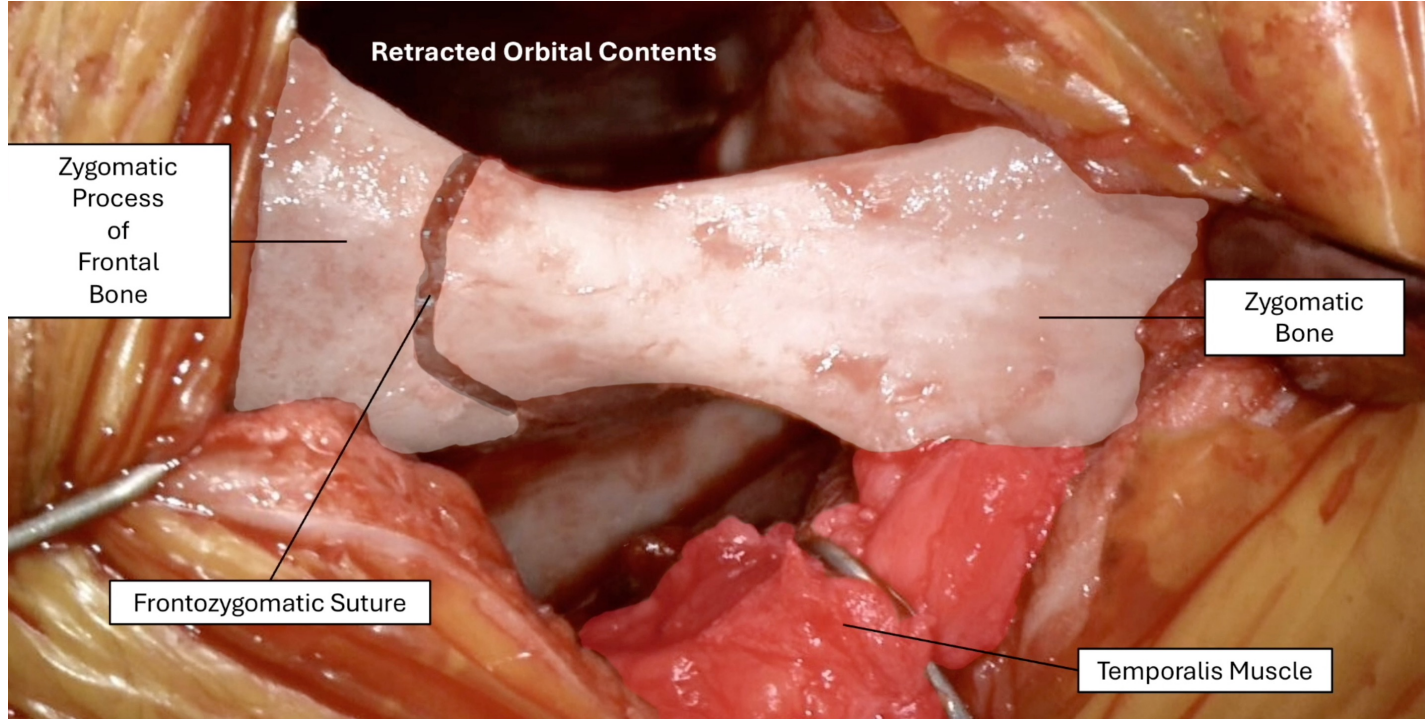
- Clinically indicated
- Recurrent leak despite initial repair with nasoseptal flap
- Persistent CSF leak considered contributing factor for chronic bronchiolitis obliterans and decline in respiratory status
- Area around the SOF/FR and the perimaxillary area
- Young age
- Advantages**
 - Direct access to the leak point via interdural dissection
 - Minimize issues with temporalis muscle wasting and craniotomy
 - Upper eyelid skin crease incision better tolerated
 - Good anticipated aesthetic outcome

Key surgical steps

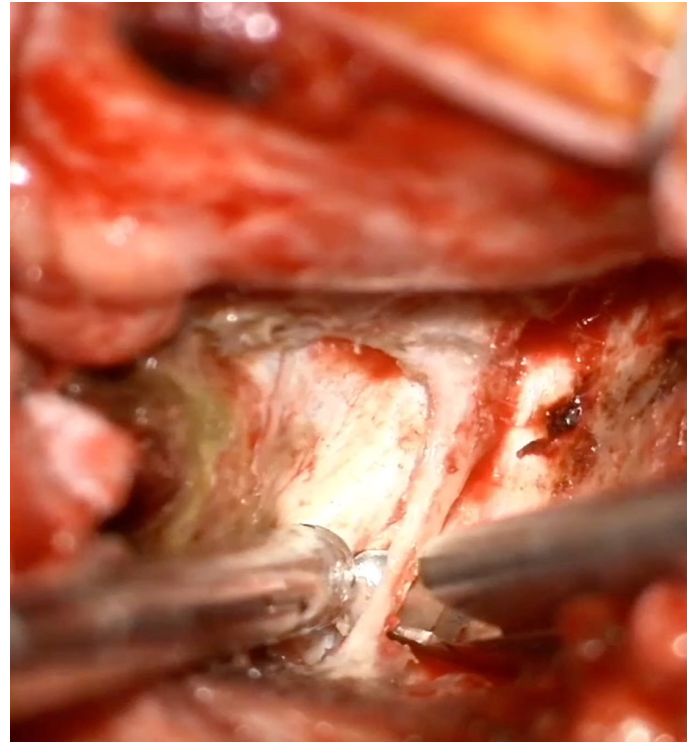
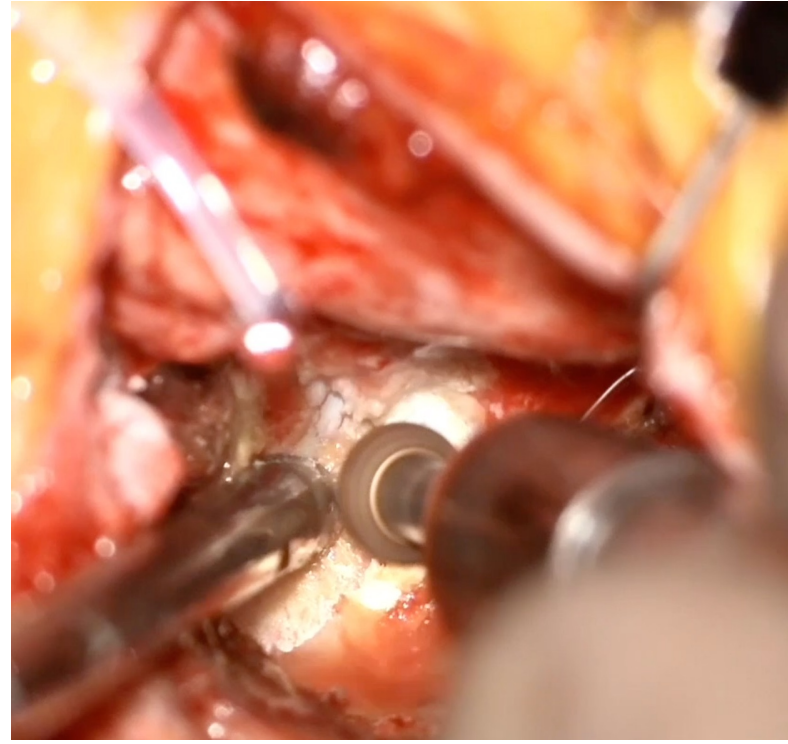
- Upper eyelid skin crease incision taken laterally to expose full lateral orbital rim**



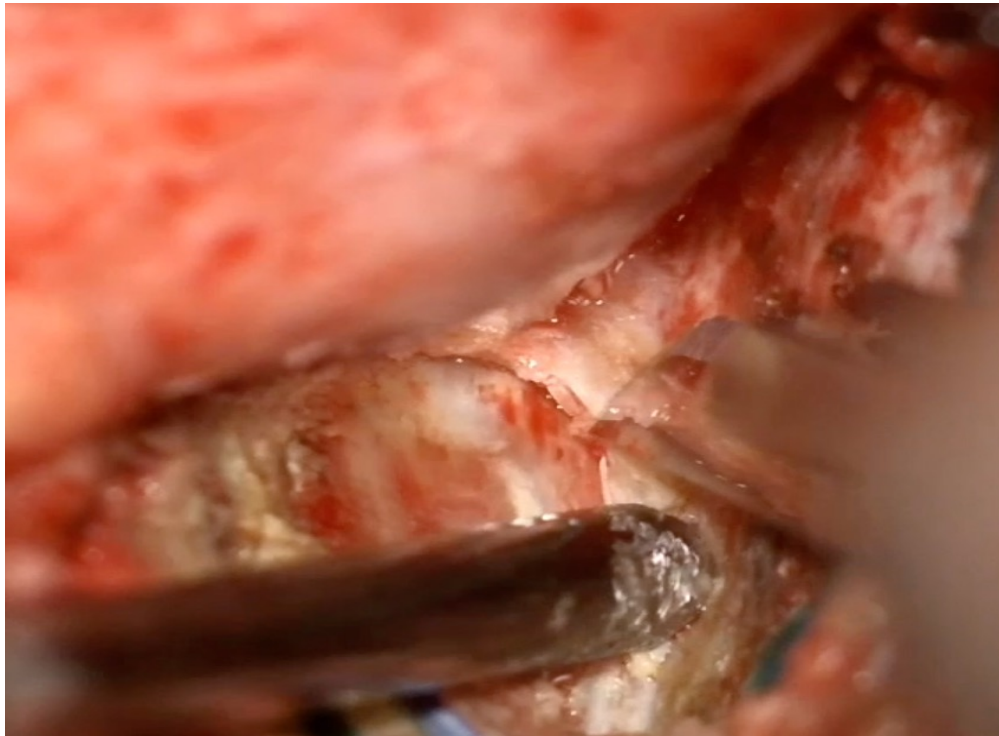
- Lateral orbital osteotomy with preservation of zygomatic bone**



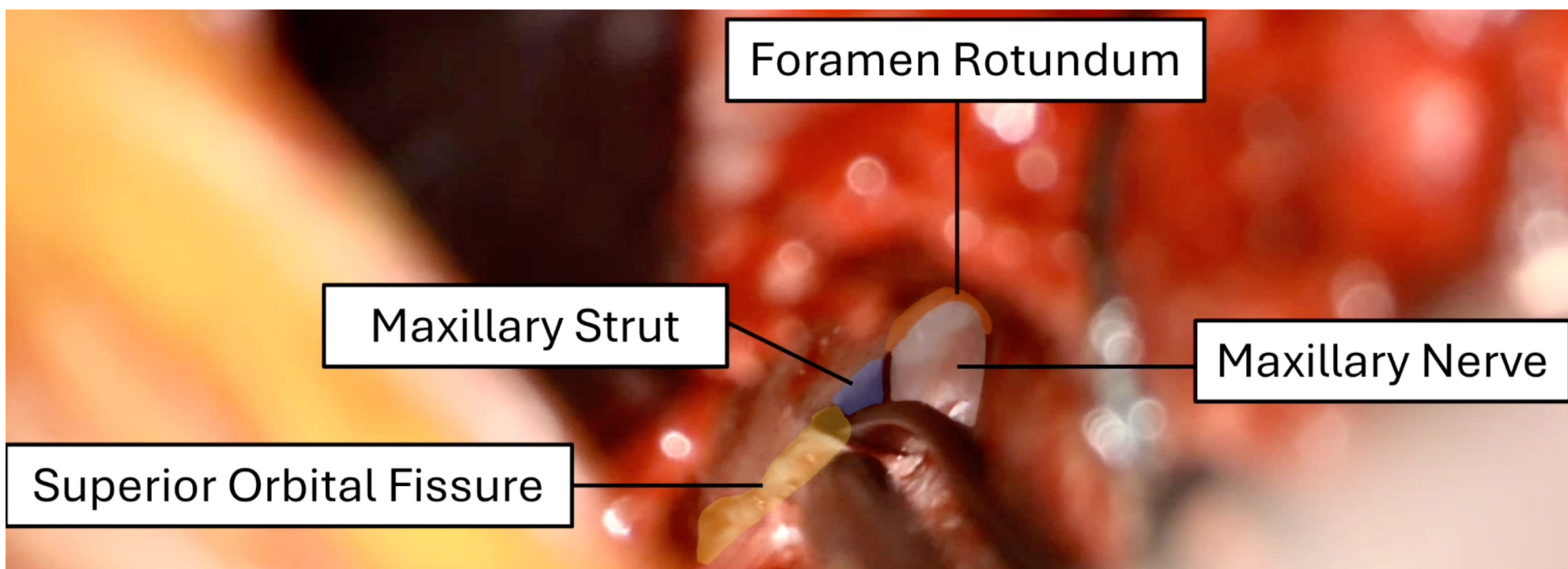
- Drilling of sphenoid ridge to unlock the SOF**



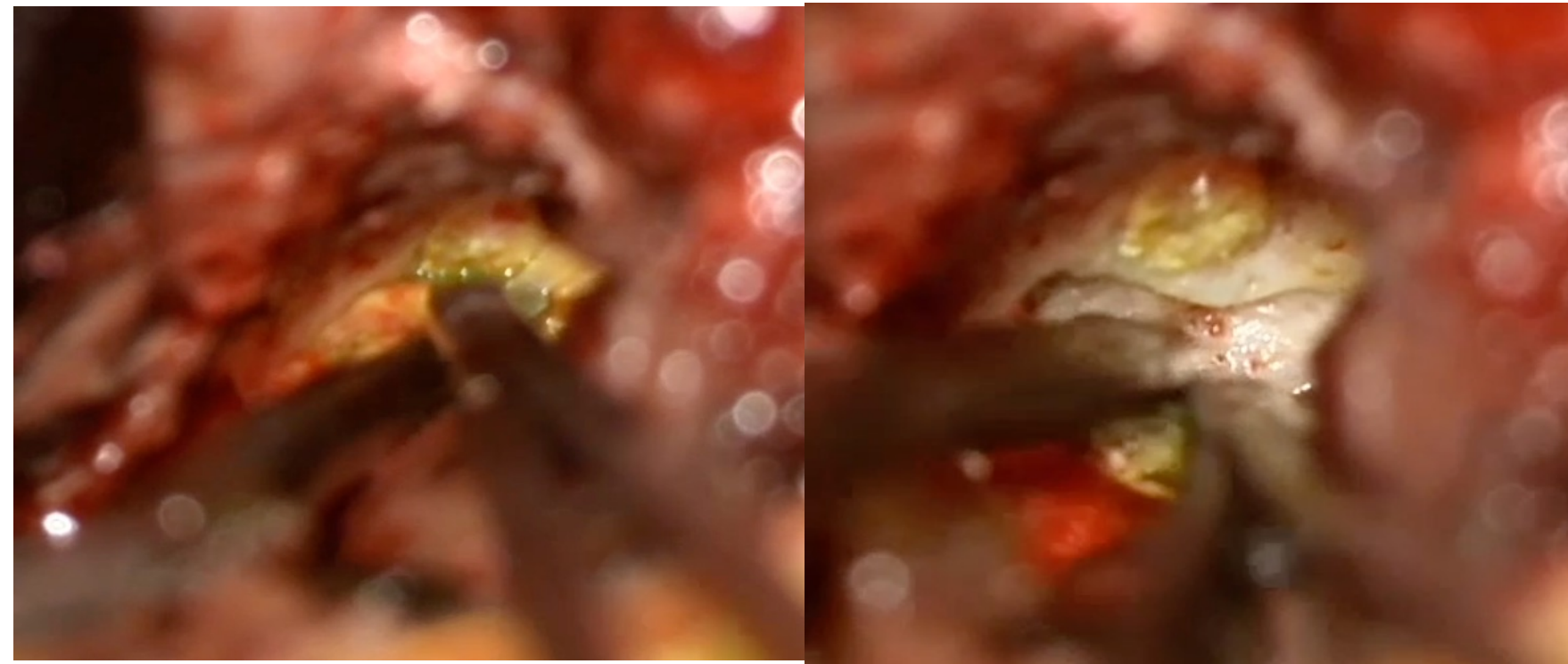
- Identification and division of meningo-orbital band**



- Interdural dissection and peeling of middle fossa/temporal dura from lateral wall of cavernous sinus**

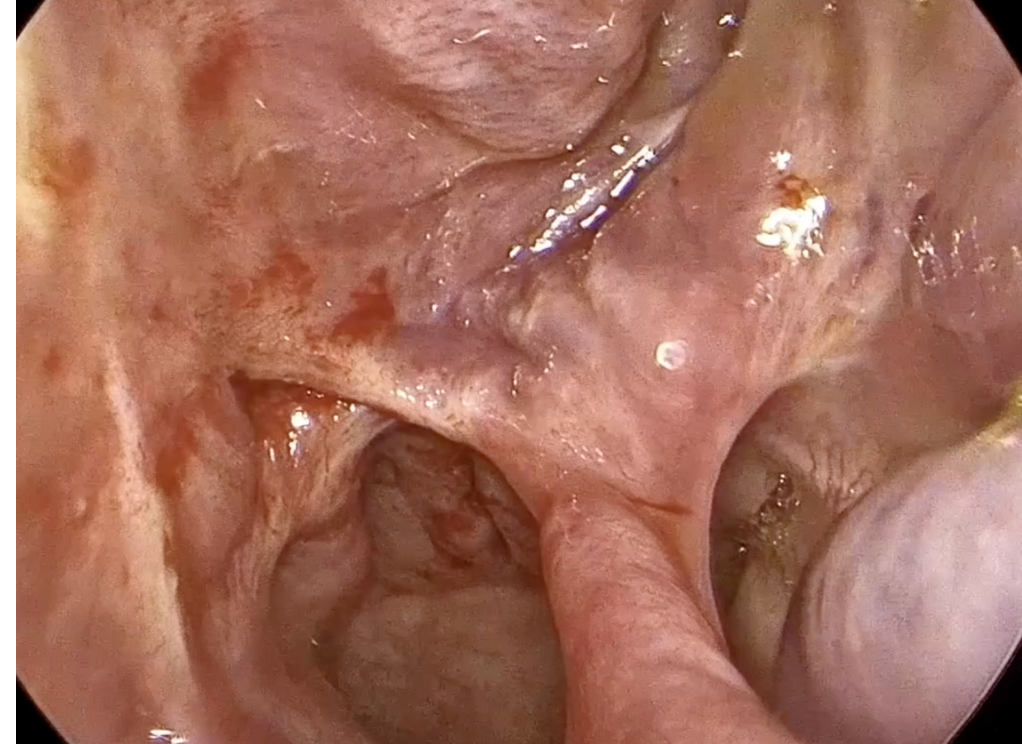
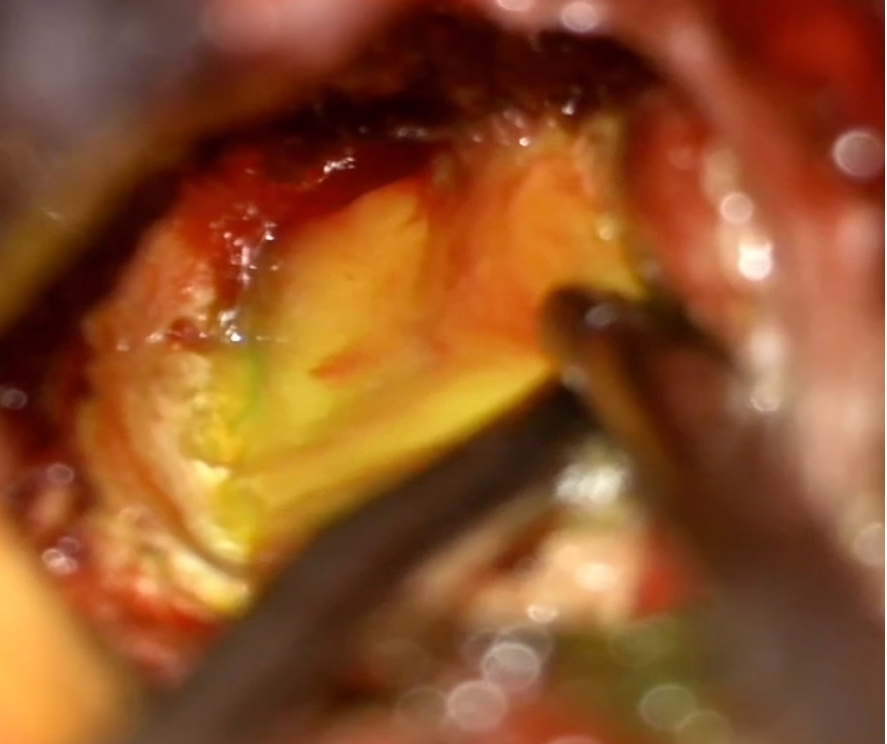
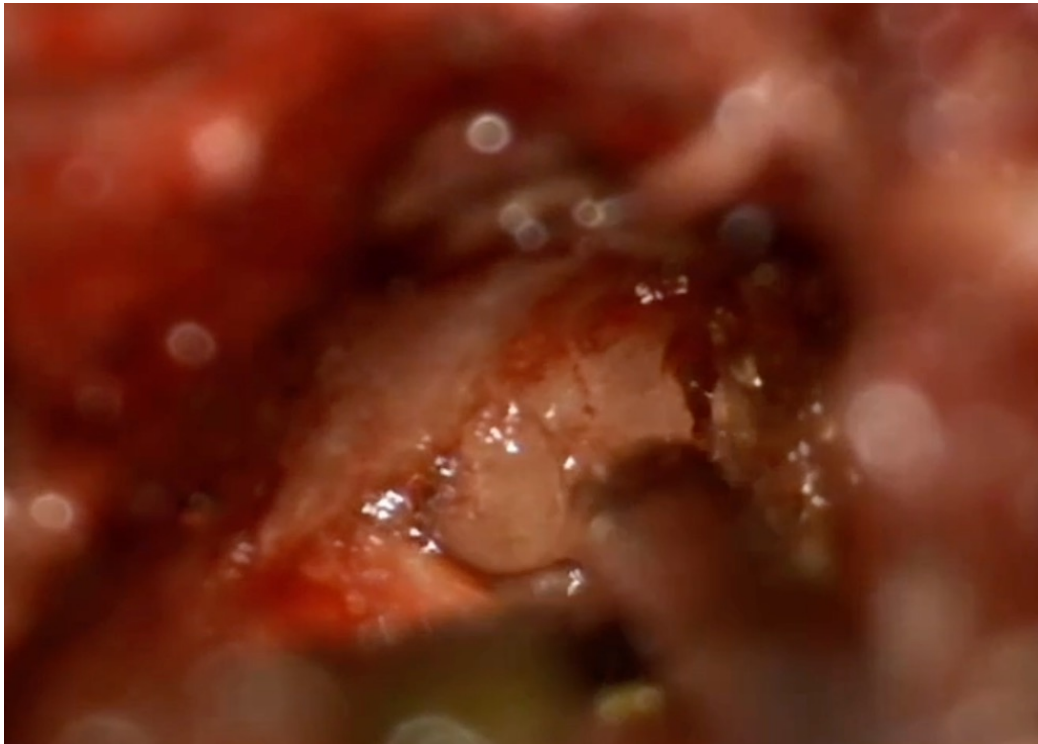


- Sacrifice of the maxillary nerve**



Closure

- Use of fat around the SOF and FR
- Dural substitute (inlay/ overlay)
- Fascia as overlay
- Confirmation of leak cessation via intraoperative nasal endoscopy



- Lateral orbital rim secured with plates and screws
- Skin closure

Outcome

- 10 month f/u
- No further CSF leak
- Respiratory symptoms in remission
- No further admissions to ICU
- No evidence of ophthalmological disturbance or extraocular muscle function disturbance

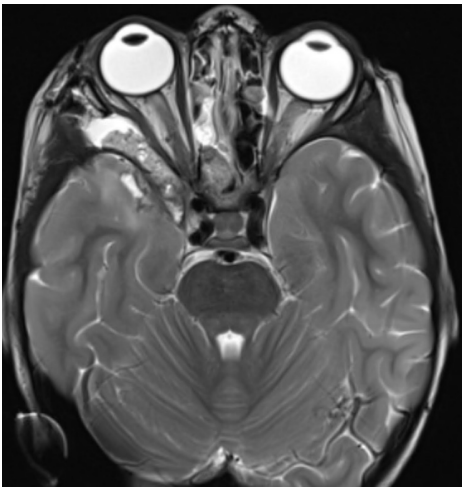


Figure 2. Post-op MRI showing no CSF under flap.

Conclusions

- Initial chronic cough associated with chronic bronchiolitis may have led to raised pressure and CSF leak which then contributed to ongoing cough with CSF aspiration thereby worsening the disease cycle
- Lateral orbitotomy is a useful approach to access area around the SOF and V2 and middle fossa
- It can be used safely in pediatric population with good outcomes
- Good cosmetic outcome with surgery in conjunction with oculoplastic surgeons

Contact

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