Central Skull Base Osteomyelitis Post Adenotonsillectomy: Case Report

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Abstract

Objective: This case report describes the first reported case of adult skull base osteomyelitis (SBO) after adult adenotonsillectomy. Central SBO is very uncommon and is associated with high mortality and morbidity. Due to this variability in presentation and treatment, further characterization of the etiology and long-term outcomes of central SBO is necessary to ensure best management.
Study Design: This is a retrospective review from a single hospital.
Case: A 53-year-old woman presented two months after adenotonsillectomy with chronic headache, weight loss, and right-sided tongue weakness. CT revealed nasopharyngeal soft tissue swelling with erosion of the right hypoglossal and carotid canals; MRI showed an extensive central skull base phlegmon involving the clivus and petrous apices with ICA encasement. Endoscopic exam demonstrated purulent drainage; pathology revealed granulation tissue with acute inflammation. Cultures grew *Streptococcus constellatus*, anaerobic gram-positive cocci, and *Staphylococcus epidermidis*. She was treated with antibiotics, resulting in symptom improvement and MRI-confirmed resolution, though mild tongue weakness persisted.

Introduction

- Adult tonsillectomy and adenoidectomy are significantly less common than in the pediatric population.[1]
- Common indications for this surgery include recurrent tonsillitis, pediatric and adult obstructive sleep apnea, and recurrent peritonsillar abscesses.[1]
- The incidence of SBO in the general population is estimated at <1 per 100,000 annually. SBO after adenoidectomy is a rare complication that has only one reported case in the pediatric literature.

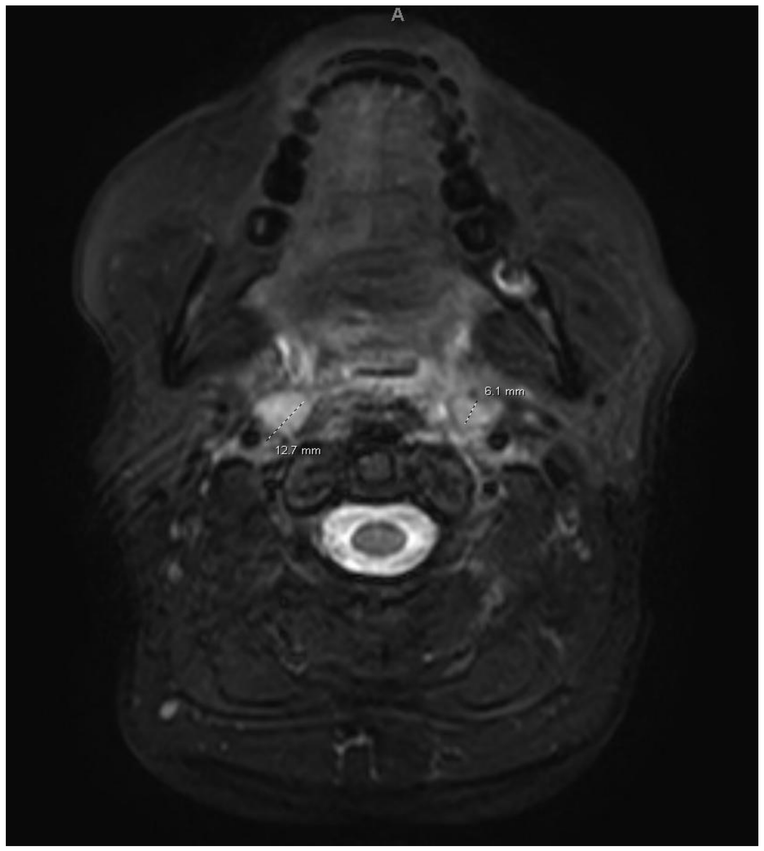

Figure 1: MRI of the central skull base revealing extensive phlegmon extending to the clivus, involving both the right and left petrous apices.

Case Presentation

History:
53-year-old female presented with 2-month history of chronic headache, weight loss, and tongue weakness, initially evaluated for possible stroke. She had a tonsillectomy, adenoidectomy, and inferior turbinate reduction for sleep disordered breathing 2 months prior to admission.

Physical Examination:
Right-sided tongue weakness with deviation to the right on protrusion. Uvula midline, symmetric palatal elevation. No oropharyngeal lesions or masses.

Laboratory:
WBC: 18, no other infection markers.

Imaging:
CT neck: Soft tissue swelling with possible nasopharyngeal fluid; **bony erosion around right hypoglossal and carotid canals**.
MRI neck: Extensive **central skull base phlegmon**, centered on clivus, extending to both petrous apices; **encasement** of distal right cervical ICA and vertical petrous ICA.
CT chest/abdomen/pelvis: No evidence of metastatic disease.

Operative & Pathology
Direct laryngoscopy & flexible nasopharyngoscopy: Purulent drainage from left adenoid pad. Right tongue base asymmetry, no mucosal mass.

Histopathology:
Nasopharynx: Granulation tissue with acute inflammation.
Tongue base: Lymphoid follicular hyperplasia. No signs of malignancy.

Cultures: Anaerobic gram-positive cocci, *Staphylococcus epidermidis* (rare), *Streptococcus constellatus* (numerous).

Management:
Initial empiric: **Piperacillin-tazobactam for concern for abscess.**
Definitive: **IV ertapenem** + **fluconazole** (6 weeks), **oral linezolid** (2 weeks).

Follow-Up:
At 2 months: Marked clinical improvement; partial tongue mobility recovery. Repeat MRI: Complete resolution of prior findings, no intracranial pathology.

Discussion

Skull base osteomyelitis (SBO):
- Rare, debilitating condition with significant diagnostic and management challenges.
- Frequently misdiagnosed due to nonspecific clinical and imaging findings.
- Imaging often mimics neoplastic lesions[1].

Common features:
- Typically involves temporal and sphenoid bones.
- Often arises from chronic mastoiditis or sinusitis[1].
- However, Central SBO is atypical:
  - Even less common.
  - Associated with high morbidity and mortality[2,3].

Literature findings (Johnson et al.):
- 42 reported cases of central SBO.
- Most presented with nonspecific headaches.
- Only 25% had sinonasal symptoms.
- Common cranial nerve deficits:
  - CN VI (31%)
  - CN IX (29%)
  - CN X (29%)
  - CN VII (21%)
- One published case of clival osteomyelitis after adenoidectomy (Moreddu et al.):
  - Pediatric patient with headache and febrile torticollis.
  - Managed with surgical drainage and oral antibiotics[5].

Unique aspects of our case:
- Presentation with headache and isolated CN XII palsy.
- Positive cultures for *Streptococcus constellatus*:
  - Not previously reported as a cause of central SBO.
- Imaging showed phlegmonous changes extending into the hypoglossal canal.
- At 2-month follow-up:
  - Persistent CN XII weakness.
  - Aligns with literature: ~31% experience residual neurologic deficits[4].

Key takeaway:
Variability in presentation, pathogens, and management underscores the need for further research into:
- Etiology
- Risk factors
- Long-term outcomes of central SBO

Conclusions

Central skull base osteomyelitis (SBO) can develop after adenotonsillectomy, as in this rare case. Clinical presentation may include non-specific signs such as headache, weight loss, and cranial nerve palsy. Key management steps include imaging to identify bony erosions and phlegmon, endoscopy with biopsy to rule out malignancy or mucosal irregularities, cultures to identify pathogens for targeted antibiotic therapy, and multidisciplinary follow-up is essential for monitoring progression and response to treatment

Contact

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