Atypical Branchial Cleft Cyst with Parapharyngeal Involvement: A Case Report

Nicole Wershoven, MD[1] ; Taylor L. Jamil, MD MPH[1] ; Drew Gottman, BS[2] ; Brian P. Cervenka, MD[1]
[1]Department of Otolaryngology, Head and Neck Surgery, University of Colorado, Anschutz Medical Campus, Aurora, CO 80045, USA.
[2]University of Colorado, Anschutz Medical School, Aurora, CO 80045, USA.

INTRODUCTION

- Branchial cleft cysts are congenital anomalies arising from incomplete obliteration of the branchial apparatus during embryogenesis.
- While they account for approximately 20% of pediatric neck masses, **they are rare in adults and often remain asymptomatic** until subsequent infection occurs.[1]
- These anomalies are typically painless; however, infections can lead to more acute presentations, including pain, swelling, and abscess formation.[1]
- This case describes **an atypical branchial cleft cyst in a 27-year-old female, exhibiting characteristics of both first and second branchial cleft cysts**, with extension into the parapharyngeal space.
- This report aims to enhance our understanding of the diagnostic and therapeutic challenges posed by such unusual cases and offer insights into their surgical management.

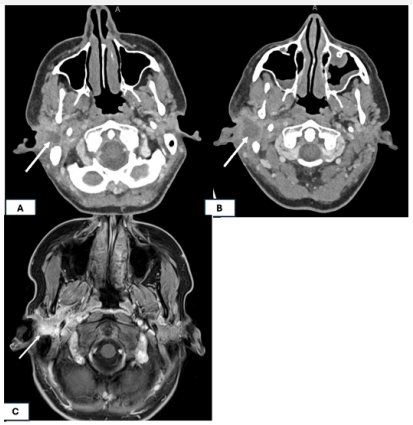

Figure 1. (A) CT scan on initial presentation demonstrating 2.4 x 2.1 cm hypoattenuating lesion in the right superior parotid space (white arrow). (B) CT scan 3 months later demonstrating a 3.4 cm parotid abscess in the same location (white arrow). (C) MRI demonstrating right-sided persistent enhancement along the stylomastoid foramen, infratemporal fossa, and the mastoid process (white arrow).

CASE REPORT

- A 27-year-old female with no past medical history with two weeks of recurring **right ear and facial pain**. Examination revealed purulent discharge from a perforated right tympanic membrane.
- A computed topography (CT) scan **demonstrated right otitis externa with a 2.4 x 2.1 cm hypoattenuating lesion in the superior parotid space** concerning for infection (Figure 1A).
- Four months later, the patient returned to the ED with worsening symptoms, including increased ear pain and swelling.
- A CT showed enlargement of the previously identified lesion, **now diagnosed as a parotid abscess measuring 3.4 cm**, with no evidence of mastoiditis (Figure 1B).
- Subsequent outpatient magnetic resonance imaging (MRI) demonstrated resolution of the fluid collection but persistent enhancement along the stylomastoid foramen, infratemporal fossa, and the mastoid process, **concerning for a type I branchial cleft cyst tract** (Figure 1C).
- Surgery was discussed with the patient but **given potential risk to the facial nerve, she elected to trial long term antibiotics.**
- Despite antibiotic therapy, the patient experienced several recurrences of post-auricular fluid collections, necessitating drainage. Thus, the care team and patient decided to proceed with surgery.
- A posterior **superficial parotidectomy was performed** to protect the facial nerve with careful dissection of the cyst tract. The tract was traced from its post-auricular origin medially and anteriorly toward the styloid process and carotid canal, running deep to the facial nerve before being ligated in the parapharyngeal space.
- Although the **patient was symptom-free for 2 months postoperatively, she eventually developed recurrent drainage** from the external auditory canal (EAC).
- A **follow-up MRI showed a fistulous tract extending from the EAC to the styloid apparatus, penetrating the pharyngeal constrictors posterior to the tonsillar pillar**.
- A **tonsillectomy and exploration of the right parapharyngeal space was performed**. During surgery, a well-defined tract deep to the tonsil was identified, dissected, and ligated via a transoral approach (Figure 2).
- The patient has since remained asymptomatic.

DISCUSSION

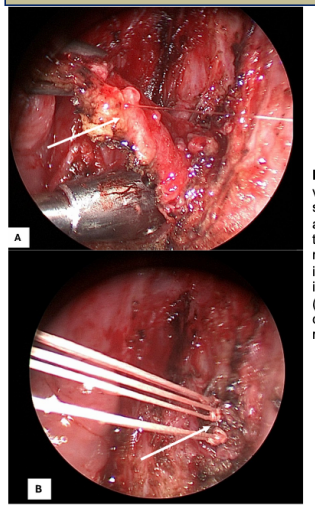

Figure 2. (A) Intraoperative view following tonsillectomy, showing the tract (white arrow) penetrating through the superior constrictor muscles. (B) The tract was imbricated and oversewn into the constrictor muscle (white arrow), ensuring closure and preventing recurrence.

- Second branchial cleft cysts are the most frequently encountered, accounting for 95% of cases, while first branchial cleft cysts represent approximately 5% to 25% of occurrences.[2]
- In this case, the **patient exhibited features of both type I and type II cysts, marking what we believe to be the first reported instance of such dual presentation**.
- **Extension of the cyst into the parapharyngeal space is exceptionally rare**, with only 25 similar cases reported in the literature.[3]
- This case highlights that **atypical head and neck lesions may not always be fully discernible on imaging alone**, necessitating a comprehensive and iterative clinical evaluation to ensure accurate diagnosis and effective treatment. **MRI with contrast, specifically brachial cleft protocol can be very effective** for delineating these cyst.

University of Colorado Anschutz Medical Campus

CONTACT:

Nicole Wershoven, MD
University of Colorado Department of Otolaryngology – Head & Neck Surgery
12631 E 17th Ave, Aurora, CO 80045
Nicole.wershoven@cuanschutz.edu

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