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CASE REPORT

Synovial Cyst of the Temporomandibular Joint: An Unusual Presentation

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This case report describes a synovial cyst of the temporomandibular joint in a 57-year-old patient presenting to the Emergency Department with ear pain and aural fullness. An audiogram revealed moderate downsloping sensorineural hearing loss in both ears, with a 30-dB air-bone gap at 500 Hz and a 20-dB air-bone gap at 1000 Hz in the left ear. Imaging (CT, MRI) revealed a soft tissue mass in the left epitympanum. Permanent specimen and frozen sections obtained after surgical removal revealed the mass to be a synovial cyst. Although the surgery alleviated the aural fullness and restored much of the conductive loss, the patient still experiences ear pain, despite a normal ear exam, and is currently being treated for TMJ dysfunction.

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Introduction

The following case report describes presentation of synovial cyst in a 57-year-old male with ear pain, aural fullness, and hearing loss.

Case Report

A 57-year-old male presented to the Emergency Department complaining of left ear pain and a sensation of aural fullness. External examination of the left ear revealed a bulging tympanic membrane (TM) and a presumptive diagnosis of otitis media. After two courses of antibiotics by mouth and no resolution of the fullness and bulging TM, he was referred to the Ear, Nose, and Throat Clinic at our institution.

Upon presentation, the patient complained of left ear fullness and pain originating from deep within his ear that occasionally radiated down his neck. He noted occasional pulsatile tinnitus and a mild hearing loss. His past medical history was significant for hypertension, hepatitis C, hyperlipidemia, and gastroesophageal reflux disease, but he had no history of otitis media, ear surgery, or head trauma.

On physical exam, the left TM appeared slightly thickened, and a mass was visible in the superior portion obscuring the epitympanic space. While the appearance was most consistent with expansion of the epitympanic space due to cholesteatoma, there was no obvious retraction pocket, debris, or purulence. The Weber test lateralized to the left, with a positive Rinne at 512 Hz. An audiogram revealed moderate downsloping sensorineural hearing loss in both ears, with a 30-dB air-bone gap at 500 Hz, a 20-dB air-bone gap at 1,000 Hz, and near closure of the air-bone gap at 2,000 Hz in the left ear.

A non-contrasted computed tomography (CT) scan of the temporal bones revealed a 1 cm x 1 cm soft tissue mass in the epitympanum laterally adjacent to the ossicular chain, with extension into the zygomatic root. The scutum and medial canal wall showed bony expansion into the external canal adjacent to the mass. Cortical thinning and erosion on the posterior margin of the temporomandibular joint (TMJ) was also observed in the adjacent temporal bone (Figures 1 and 2).

T1- and T2-weighted magnetic resonance imaging (MRI) with and without gadolinium contrast was then performed for further evaluation of the soft tissue mass in the left epitympanum. Fat-suppressed post-

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gadolinium images showed a focus of heterogenous enhancement posterior to the glenoid fossa and extending into the epitympanic space (Figure 3). The imaging analysis led to a differential diagnosis of a glomus tumor, cholesteatoma, or chronic otitis media.

The patient elected to proceed with surgical exploration, in which a standard postauricular skin incision was made, followed by elevation of the tympanomeatal flap. The middle ear space was clear, but more superior dissection revealed a smooth bony expansion of the medial superior bony canal wall. An extended atticotomy was performed to reduce the bony expansion, exposing a cystic structure measuring approximately 1 cm x 1 cm. An encephalocele was considered, but superior dissection revealed an intact tegmen superiorly. The lesion was decompressed and observed to be filled with a very viscous, mucoid fluid.

The cyst wall was dissected off the ossicular chain, and further drilling anteriorly in the zygomatic root area revealed a 1 mm x 1 mm defect in the posterior superior wall of the glenoid fossa that was in continuity with the cyst wall. The ossicular chain was left intact, and the defect in the canal wall was reconstructed with cartilage. Permanent specimen and frozen sections were obtained, and the mass was determined to be a synovial cyst (Figures 4 and 5).

The patient's post-operative course was uneventful, and he is now one year post-surgery. His conductive loss improved after surgery, and he no longer experiences aural fullness. However, the patient still experiences ear pain, despite a normal ear exam, and is currently being treated for TMJ dysfunction.

Discussion

Cysts of the TMJ are rare and can be either ganglion or synovial cysts. A review of the literature revealed 26 reported cases of TMJ cysts,[1-4] most of which were ganglion cysts lateral to the TMJ presenting as parotid tumors or cysts. Typically, ganglion or synovial cysts are found in other joints, such as the wrists, knees, and feet,[5] and usually present with pain, swelling, or decreased joint function.[6] Although the names for either type of cyst are frequently, albeit erroneously, used interchangeably, their pathologies are very different.[2,7] Synovial cysts are true cysts lined by synovial cells that may or may not communicate with the joint capsule.[8,9] They arise from synovial herniation secondary to increased intraarticular pressure resulting from trauma, rheumatoid arthritis, osteoarthritis, or synovitis as a protective mechanism to allow joint decompression.[8,10-12] Ganglion cysts are pseudocysts with a fibrous tissue lining containing a viscous, gelatinous material.[13] They are speculated to arise from myxoid degeneration of the collagenous joint capsule wall.[12,14]

Each cyst type may mimic more common etiologies, such as parotid tumors, parotid cysts, sebaceous cysts,

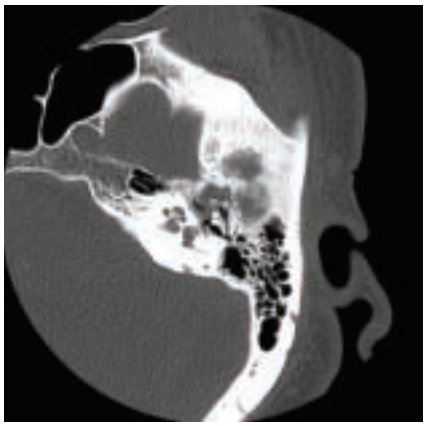

Figure 1. Non-contrasted axial CT of the left temporal bone showing soft tissue in the anterior epitympanic space.

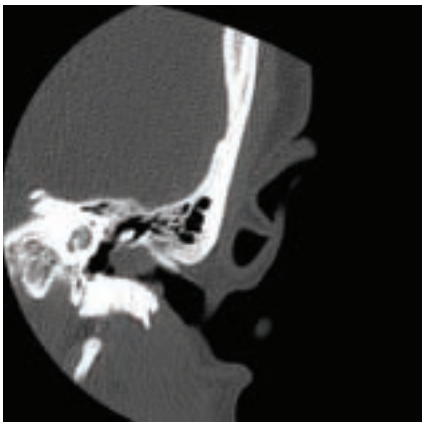

Figure 2. Non-contrasted coronal CT of the left temporal bone showing soft tissue protruding from the epitympanic space into the external auditory canal.

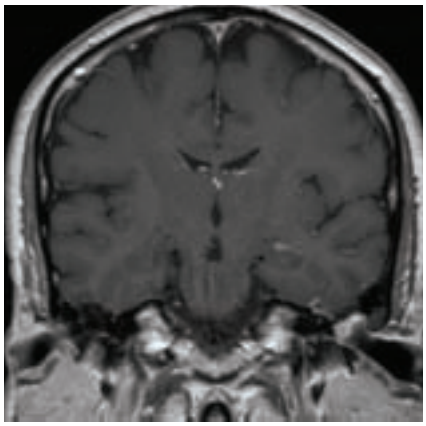

Figure 3. Fat-suppressed post-gadolinium MRI showing heterogenous enhancement posterior to the glenoid fossa extending into the epitympanic space.

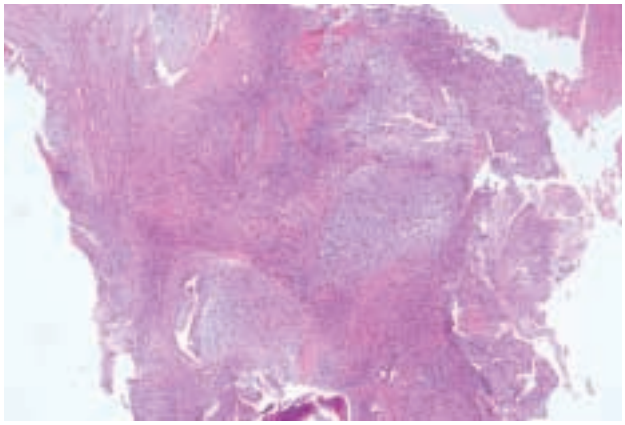

Figure 4. Low-power microphotograph of the lesion shows fibroblastic/myofibroblastic proliferation, myxoid degeneration, reactive bone formation, hemosiderin-laden macrophages, and inflammatory cells.

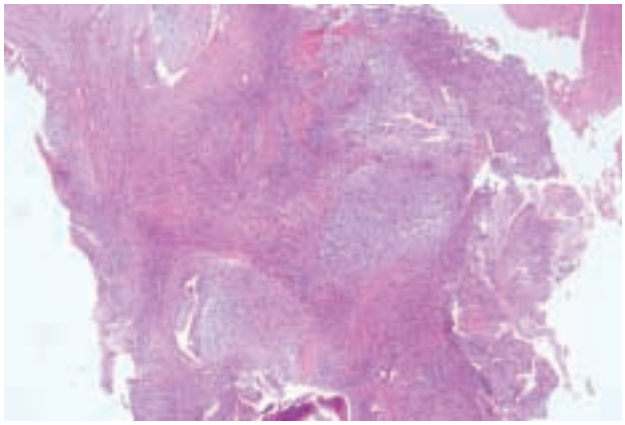

Figure 5. High-power microphotograph shows the fibroblasts/myofibroblasts are spindled, with a smooth nuclear border, hypochromatic nuclei, and minute nucleoli admixed with benign inflammatory cells.

branchial cleft cysts, lymphangioma, and vascular tumors, making a clinical diagnosis difficult.[15-17] A definitive diagnosis is frequently only obtained upon intra-operative or pathologic examination.[18] Pre-operative MRI is the most useful imaging modality when a TMJ pathology is suspected.[1,12] Mixed tumors, such as those arising from the TMJ, typically have low intensity on T1 images and high intensity on T2 images.[19] Ultrasound has been used in the past for such lesions and was first recommended by Lopes et al.[7] However, recent reports of cystic lesions with atypical echogenicities on ultrasound seem to suggest that the utility of this imaging modality is limited.[20] Post-operative pathological examination and immunohistochemical staining of the lining of the cyst may also be helpful in diagnosis.

Symptomatic cysts of the TMJ usually present laterally in the parotid region and generally require complete surgical excision as incomplete excision or drainage can result in reoccurrence.[21] Our case is, to the best of our knowledge, the first report of a TMJ synovial cyst presenting posteriorly, with a protrusion into the external ear canal presenting as an epitympanic mass. It is believed that the patient's initial ear pain was misdiagnosed as acute otitis media and that the TMJ dysfunction was the probable cause of pain. In addition, the associated osteoarthritis was believed to be the pathological process leading to the development of the synovial cyst.

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