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CASE REPORT

Cholesterol Granuloma in Middle Ear Mimicking Glomus Tumor

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ABSTRACT

Cholesterol granuloma is one of the rare sequel of chronic otitis media, posing diagnostic dilemma. We report a case of cholesterol granuloma of middle ear and mastoid mimicking glomus tumor. To the best of our literature search this has never been reported in local literature. Case is presented with literature reviewed.

Key Words: Cholesterol granuloma, chronic suppurative otitis media, mastoid antrum, middle ear

INTRODUCTION: Cholesterol granuloma is one of the rare sequel of chronic otitis media. It can occur in any pneumatized area of temporal bone, middle ear cavity, mastoid antrum, EAC or the petrous apex. Patients with cholesterol granuloma, limited to middle ear typically presents with conductive hearing loss and blue ear drum, while those at the temporal bone either presents as an incidental finding or with side effects of bone erosion i.e sensorineural hearing loss, tinnitus, vertigo or cranial nerve impairment. We report a case where cholesterol granuloma was found in both middle ear cavity and mastoid antrum, mimicking glomus tumor.

Case Summary: A 32 year old female with no known co-morbidities presented in ENT outpatient department, with complains of right ear discharge for 5 months. Discharge was sudden in onset, progressively worsening. It was yellow in color, thick and mucoid. She also complains of bad odour from the discharge. She then started noticing right sided headache, it was severe in intensity, tightening in nature, progressively worsening and relieved on taking painkillers. Patient also complains of tinnitus and vertigo for 5 months. Patient had similar complains of discharge from the left ear 4 months back which later becomes dry. She complains of decreased hearing from the left ear but no complains of hearing impairment from the right side. No facial weakness was ever present in her life. Her right ear was operated 20 years back from a tertiary care hospital for similar complains of ear discharge. On examination patient was conscious and well oriented. Her vitals were normal. No pathology seen in pinna or external auditory canal of both ears. On examination of right ear, bluish white mass seen to be bulging from the middle ear along with granulation tissue reaching upto aditus and antrum with disturbed tympanic membrane landmarks (Fig. 1a). Large dry central perforation was seen in left ear (Fig. 1b).

On tunning fork test, Rinne's in the right ear was positive while negative for the left ear. Weber's lateralized towards the left ear. Pure tone audiometry was done with poor response from the patient. It showed 30 db mixed hearing loss of right ear and 20 db conductive deafness of left ear. All cranial nerves were intact.

CT scan temporal bone was advised which showed soft tissue mass of 2.0 x 1.9cm (AP x TR) in the right middle ear cavity involving the pars flaccida of tympanic membrane. Superiorly extending into prussac space with erosion of scutum. Expansion of mastoid antrum with extension into mastoid air cells causing marked pressure erosion with destruction of right lateral wall of mastoid part of temporal bone. Mass is also seen to be extending into the external auditory canal. Tegmen tympani and ossicles were found to be intact. Soft tissue thickening also seen in left middle ear cavity, rest of the scan appears normal (Fig. 2). MRI bilateral temporal region was advised which showed abnormal signal intensity which appeared high on T1WI and

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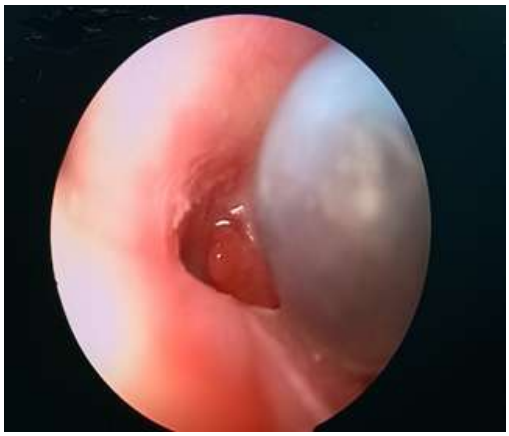

Fig. 1(a): Bluish Mass Arising From Right Ear Resembling Glomus Tumor

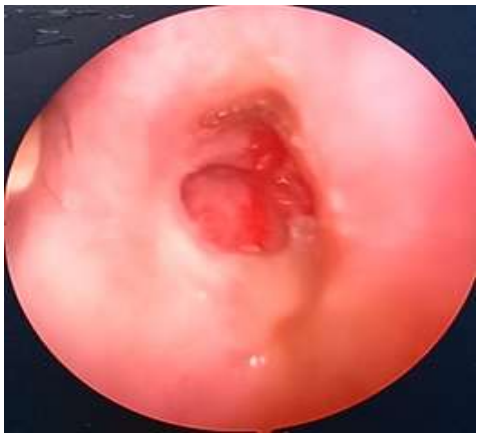

Fig. 1(b): Dry Central Perforation of Left Ear

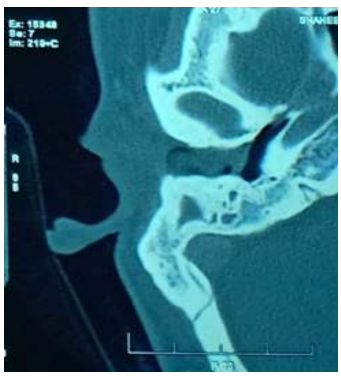

Fig. 2: HRCT Temporal Bone

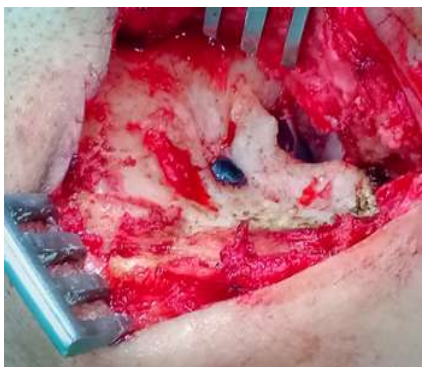

Fig. 3: Sac of Cholesterol Granuloma in Mastoid Antrum and Middle Ear

Fig. 4: Postoperative Picture of Patient

T2WI and showing no fat suppression. The above findings were suggestive of cholesterol granuloma as a sequel of CSOM.

Her right mastoid exploration was planned and after EUA, incision was given behind the right ear and periosteal flap was taken. Mastoid was drilled, cholesterol granuloma identified. Sac of cholesterol granuloma was thin walled and bursted during procedure with thick golden fluid came out. Walls of granuloma sent for histopathology. Disease removed from antrum, aditus and attic. Malleus was found to be eroded, incus was then trimmed and placed on stapes. Graft from periosteum was placed on incus and meatoplasty was done.

Postoperatively patient had normal facial nerve function (Fig. 4). Her histopathology report showed inflammation, hemorrhage and cholesterol cells with calcifications, suggestive of cholesterol granuloma

DISCUSSION: Cholesterol granuloma is a tissue response to the foreign body i.e cholesterol crystals, which are the breakdown products of blood and local tissue. Three important factors in the formation of cholesterol granuloma includes interference of drainage, hemorrhage and obstruction of ventilation[1]. Previously only classic obstruction-vacuum hypothesis was accepted which says that the cholesterol granuloma is formed in petrous apex because of mucosal swelling which causes blockage of air. Trapped gases produces a vaccum which triggers bleeding and hence formation of cholesterol granuloma. Jackler et al. in 2003 proposed another hypothesis of genesis of cholesterol granuloma in petrous apex , exposed marrow theory, in which he found deficient septation between air cells and marrow. Hemorrhage from the exposed hematopoietic marrow coagulates within the mucosal cells and blocks the outflow pathways resulting in formation of cyst which results in bony erosion[2,3]. There is another theory of

robust blood supply which hypothesized that the blood supply from sigmoid sinus, carotid artery or large epidural vein is necessary for cholesterol granuloma formation and destruction of bone[4].

Cholesterol granuloma can be associated with a variety of middle ear diseases[1], specially COM and secretory otitis media. However it can be present as an isolated middle ear mass without prior history of infection as reported by miglets et al and leonetti et al. in their studies[5,6].

Researches have shown that cholesterol granuloma was present in 12-20 percent of temporal bones with COM[5,7,8]. Da Costa et al in 1992 while comparing histopathological findings of COM with and without perforation reported that cholesterol granuloma was found to be present in 21 percent of patients with perforations and 12 percent of patients with an intact T.M[9].

Martin et al in his study in 2005 explained that the macroscopic findings of the sac of cholesterol granuloma might also suggest its benign or aggressive nature. He suggested that if the walls of the granuloma are thin they are relatively benign as compared to thick walled which are aggressive in nature and tend to erode bone[10].

In our case we have found sac of cholesterol granuloma in petrous apex, middle ear and mastoid antrum with TM perforation and cholesteatoma formation in the middle ear. The sac was thin and brusted easily may be this was the reason why it had no intracranial extension in our case.

Management options depends on the location of the sac, its extent, its neurovascular connections and the symptoms it is causing. In patients who have no or slight symptoms “wait and scan” policy can be used. This policy can also be used in patients who are symptomatic but are unfit for surgery or elderly. In this case long term followup with yearly CT/MRI scan is required to compare the growth of sac[11,12].

In 2012 a case was reported in which an asymptomatic patient with mild tinnitus and no hearing impairment or cranial deficit was presented. His CT scan and MRI were suggestive of cholesterol granuloma of petrous apex. As the patient had no symptoms they adopted wait and scan policy and found after two years the significant reduction of the size of sac on MRI and improvement of symptoms[11].

However, those patients who have symptoms and large granulomas threatening neurovascular and causing significant hearing impairment needs to be surgically addressed. Grinblat et al included 55 patients in his study. Out of these 55, 31 underwent surgical procedure through different approaches. He noticed significant improvement of symptoms postoperatively[12].

In our case patient had symptoms, hence surgical procedure was preferred. On postoperative followup there was significant improvement of hearing and resolution of headache and tinnitus.

CONCLUSION: Cholesterol granuloma though rare but can cause several severe complications. Diagnosis is usually made on clinical suspicion and CT/MRI scan is diagnostic. Upon diagnosis cyst requires to be removed surgically with its walls along with the removal of disease from the ear. If left untreated an expanding sac with aggressive nature can erode the bone and penetrate intracranially.

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