Research Paper

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Cholesterol Granuloma in Middle Ear and Mastoid. A Case Report

Medical Science

KEYWORDS : Granuloma, Mastoidectomy, Attic, petrous apex.

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ABSTRACT

Cholesterol granuloma is a rare clinical entity involving formation of inflammatory granulation tissue in response to the deposits of cholesterol crystals. cholesterol crystals act like a foreign body and evoke inflammatory response. It can involve any part of temporal bone but mostly petrous apex is affected. Here with we are reporting a case of chronic suppurative otitis media with Cholesterol granuloma involvning attic and mastoid tip. Cholesterol granuloma is an incidental intraoperative finding. He was treated with modified radical mastoidectomy with tympanic membrane foot plate assembly with good result.

CASE REPORT: A 35 year old man from a rural village, farmer by occupation, came with discharge from Right ear since 3 years. Ear discharge, recurrent attacks, mucopurulent discharge, copious, non foul smelling. Occasional blood stained discharge present. Each attack lasting for 5-10 days, more during attacks of cold and relived by taking medication. H/O decreased hearing and ringing sensation present. No h/o of trauma, recurrent cold attacks or allergy. No h/o diabetes or hypertension, asthma or epilepsy.

On examination, Right ear, there is gross retraction of the tympanic membrane with small central perforation in anteroinferior quadrant. Tympanic membrane which is retracted onto the medial wall of middle ear appears atrophic with granulations. Handle of malleus is seen and incudostapedial joint could not be identified. Left ear is normal. Tuning fork tests revealed conductive deafness in right ear with normal bone conduction.

Hematological investigations are within normal limits. X ray both mastoids reveal scelorotic mastoid on right side. Pure tone audiometry shows there is severe conductive hearing loss, about 60 db.

He is posted for cortical mastoidectomy with tympanoplasty under general anaesthesia. Postauricular approach, temporalis fascia graft harvested, horizontal meatotomy done. Tympanic membrane is atrophic and plastered onto medial wall of middle ear, gently separated. Medial wall of middle ear is edematous. Handle of malleus, Long process of incus and suprastructure of stapes is eroded, only footplate of stapes is present. Mastoid antrum is opened and found to have granulations and edematous unhealthy mucosa and removed. All mastoid air cells are involved with edematou mucosa and granulations. As most of the mastoid air cel system is filled with granulations, we decided to go for modified radical mastoidectomy. No cholesteatoma observed. Facial bridge broken, remnant incus removed, eroded malleus is also removed. There is a blackish well circumscribed mass of size 3mm/4mm seen in attic, medial to head of malleus and body of incus, lying over tympanic segment of facial nerve near cochleariform process(Fig.1). There is oil like straw colour luid oozing from the lesion while dissecting. Carefully dissected, removed and sent for HPE. There is partial erosion of tympanic segment of facial nerve. There is also similar mass in mastoid tip (Fig.2), 5mm/6mm in size, which is also carefully dissected, removed and sent for HPE. Facial ridge lowered, temporalis fasscia graft kept by underlay technique, remnant incus sculptured and kept over foot plate of stapes with soft tissue cover over facial canal. Wide meatoplasty done, mastoid cavity is filled with gelfoam and incision closed in layers. Postop recovery uneventful.

Wound healed well, graft taken up well, hearing improved. Histopathlogy report came as cholesterol granuloma, containing multinucleated giant cells around cholesterol crystals.

Fig.1. Cholesterol granuloma in attic

Fig.2. Cholesterol granuloma at mastoid tip

DISCUSSION:

Cholesterol grnauloma was first described as idiopathic hematotympanum by Gruber in 1888, and first case report of Cholesterol grnauloma middle ear has been reported by Manasse in 1917. The pathogenesis includes obstruction to ventilation and poor drainage in the temporal bone which leads to extravasaion of blood. So principal predisposing factor is chronic middle ear effusion. Breakage of this blood leads to formation of cholesterol crystals. cholesterol crystals acts as irritant foreign bodies and cause irreversible tissue reaction by stimulating foreign body giant cells. This involves mostly petrous apex followed by middle ear, mastoid. Rarely it can protrude into the external auditory canal from middle ear. Other theories for petrous apex cholesterol grnauloma is persistent mesenchyme, cholesteatoma, granulation tissue, tympanosclerosis. Latest theory for petrous apex cholesterol grnauloma is exposed marrow theory by jackler in 2003. Macroscopically it appears as a slow growing, expansile benign mass that contains brownish yellow debris with cholesterol crystals.

Clinical finding in some cases may be a blue ear drum or adhesive otitis media, hearing loss, facial nerve paralysis, chronic ear discharge, headache. Usually they are benign but locally aggressive and they cause symptoms by pressure effect. Petrous apex lesions cause more destruction and difficult to treat.

They can be diagnosed preoperatively with CT and MRI. CT scan reveals a soft tissue mass, with sharp ansd smooth margins, isodense with brain and non enhancing. MRI appears homogenous with increased signal intensity relatively to the brain in both T1 and T2 weighted images. There is no enhancement with gadolinium. MRI is more specific than CT in suggesting correct diagnosis.

Differential diagnosis for petrous apex cholesterol grnauloma is cholesteatoma, mucocoele, epidernoid cyst, chordoma, metastasis, and petrous apicitis, .

Histopathological appearance:

Depending on the characteristic histological feature, "cholesterol granuloma reaction" was classified into 3 groups, each of which also represented a step of process of organization. Group I (cholesterol clefts predominates in hemorrhagic and necrotic foci), group II (foreign body giant cells, macrophages, round cell infiltrations are present other than cholesterol clefts, signifying active organization), group III (numerous cholesterol clefts predominates in fibrous scar tissue)(.Fig 3 &4).

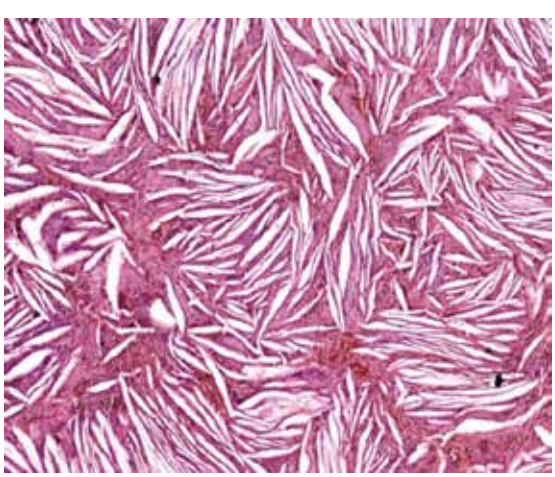

Fig.3.Cholesterol granuloma (H&EX40) with cholesterol crystals.

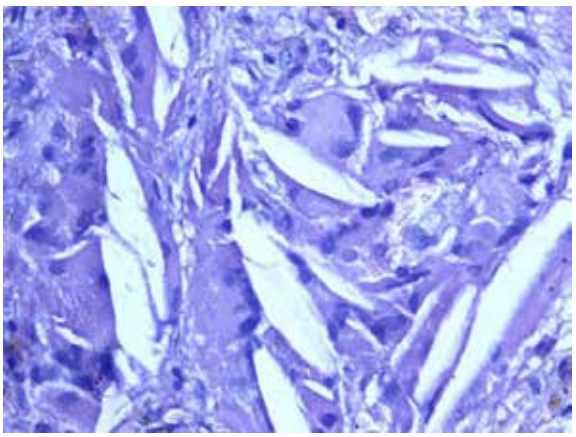

Fig.4.Cholesterol granuloma (H&EX400) foreign body giant cell infiltration.

TREATMENT: Surgical removal of granuloma is the treatment of choice. Cortical mastoidectomy with complete removal of granuloma may be sufficient. It is not an indication for modified radical mastoidectomy per se. Petrous apex lesions require more aggressive treatment to prevent complications. Surgical approach to petrous apex lesion depends on preoperative hearing status, size of lesion, location of jugular bulb and relation of lesion to petrous bone. If adequate hearing is to be preserved middle fossa, infralabyrinthine, sub occipital, trans sphenoidal and infra cochlear approaches are the options available. In deaf patients trans labyrinthine approach is the best approach. Middle fossa approach is recommeneded for giant cholesterol grnauloma extending towards middle cranial fossa. The trans sphenoidal endoscopic approach can be used for granulomas that involve the sphenoid sinus. Infra labyrinthine approach is not safe in patients with high jugular bulb.

CONCLUSION: Choesterol granuloma is a pathological lesion affecting poorly ventilated mastoids. Sometimes an incidental intraoperative finding. The principal predisposing factor is chronic middle ear effusion. Patient may have persistent ear discharge despite prolonged antibiotic usage, hearing loss may not be corresponding to the size of the perfoartion. Best investigation to diagnose and evaluate Choesterol granuloma is MRI. Complete removal of granuloma and providing good ventilation for middle ear and mastoid is the treatment. Recurrence is rare.

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