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Case Report

Incudostapedial joint dislocation with conductive hearing loss: a case report

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ABSTRACT

Trauma to the ossicular chain is a common complication of fracture temporal bone, ossicular dislocation being more common than ossicular fracture. Most commonly affected ossicles are the incus and malleus, stapes being relatively more stable. The most common injury is the incudostapedial joint dislocation. We are presenting a case of unilateral conductive hearing loss in a patient with the pre operative diagnosis of otosclerosis, which intra-operative turned out to be incudostapedial joint dislocation with malleus fixation, successfully reconstructed with partial titanium implant.

Keywords: Temporal bone trauma, Ossicular injuries, Incudostapedial joint

INTRODUCTION

Tympanic membrane rupture and dislocation of the ossicular chain may occur after direct trauma, as with an ear bud, or by indirect trauma such as head injury.[1] Injury of the temporal bone after head trauma is a common problem. The consequences of the temporal bone fracture are hearing loss (conductive, sensorineural or mixed), tinnitus, vertigo, facial nerve paralysis. Five types of ossicular dislocations seen are: incudostapedial joint dislocation; malleusincus joint dislocation, Incus dislocation; dislocation of the malleoincudal complex; stapediovestibular dislocation.[2]

CASE REPORT

A 46 year old male patient presented with decreased hearing left ear. There was no h/o ringing in the ear, giddiness, discharge from the ear. There was past h/o head injury 8 years back with trauma to the left ear. Microscopic examination of the ear showed normal tympanic membrane. The Rinne test was negative on the left and Weber lateralized to the left ear. Audiogram was done which showed a conductive hearing loss of 45 dB (pure tone average of 500, 1 K and 2 Khz) and an air-bone gap of 33.34 dB across speech frequencies. Impedance audiometry revealed a type A curve with absent reflexes. So diagnosis was made of left ear otosclerosis with conductive hearing loss and patient was posted for left ear stapedectomy with reconstruction under local anaesthesia.

Endaural incision made, tympanomeatal flap elevated and the ossicular chain were inspected. The incudostapedial joint was found to be dislocated (Figure 1). Stapes footplate was mobile. The long process of the incus was laterally displaced, away from the stapes, toward the tympanic membrane and malleus was fixed. Incus was removed and malleus head nibbled. Reconstruction done with partial titanium implant, which was placed directly over the stapes head (Figure 2) and covered with tympanomeatal flap. Ear packed with gel foam. Postoperative audiogram was done after 3 months showing full airbone gap (ABG) closure.

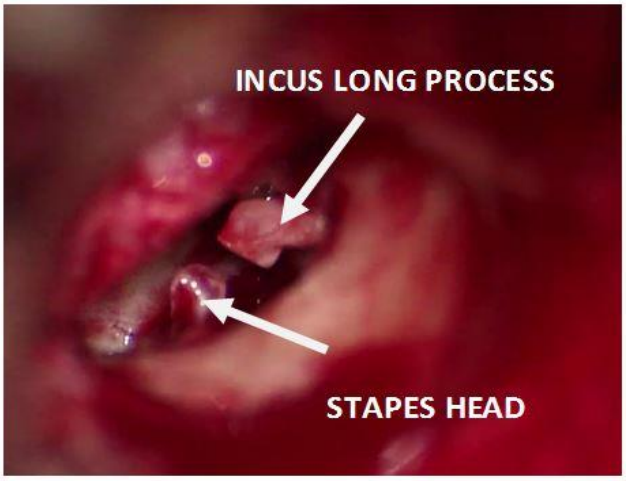

Figure 1: Showing dislocation of incudostapedial joint.

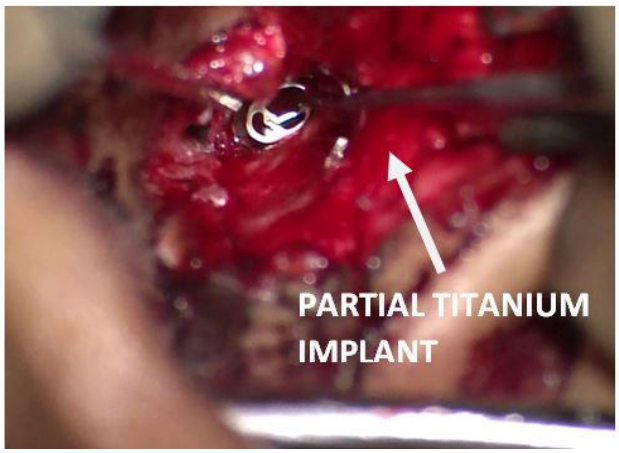

Figure 2: Showing partial titanium implant on the stapes head.

DISCUSSION

Direct trauma (e.g. ear bud), or indirect trauma (e.g. head injury) may lead to traumatic rupture of the tympanic membrane and ossicular chain dislocation. Skull trauma from blow to the temporal, parietal, or occipital region (with or without fracture of the temporal bone) is the main cause of ossicular injury.[3]

Trauma to the temporal bone is usually associated with conductive, sensorineural, or mixed hearing loss, tinnitus, and vertigo due to ossicular disruption or labyrinthine damage.[4] Other injuries include labyrinthine fractures, dural fistula, facial nerve paralysis and carotid canal injury. Conductive hearing loss can be due to tympanic membrane laceration, hemotympanum or ossicular damage. Even after the resolution of the hemotympanum or healing of the tympanic membrane, if hearing deficit persists, then ossicular dislocation or fracture is obvious.[5]

Fractures of the temporal bone can be categorized into three types (longitudinal, transverse, or mixed) on the basis of relationship between the fracture line and the long axis of the petrous portion of the temporal bone. Oblique fractures, also called mixed or complex fractures, are the most common types, followed by longitudinal and transverse fractures.[6]

Traumatic ossicular lesion is usually associated with longitudinal fractures and is present in almost 20% of cases with head trauma. The most commonly affected ossicles are the incus, malleus and stapes being relatively more stable.

Five types of ossicular dislocations seen are: incudostapedial joint dislocation; malleusincus joint dislocation, Incus dislocation; dislocation of the malleoincudal complex; stapediovestibular dislocation.[7]

The most common defect is the incudostapedial joint dislocation.[4] The two main reasons for incudostapedial joint dislocation are 1) incus is the heaviest ossicle with no muscular anchor and has the weakest attachment of the ossicular chain, between the malleus and stapes that are both firmly anchored and 2) the incudostapedial joint is only a fragile joint which is usually the first injured.

Another theory is antagonist ossicular muscles simultaneous contraction. The stapedius muscle tendon attaches to the head of the stapes near the incudostapedial joint. The tendon of the tensor muscle fixes the neck of the malleus. Tetanic contraction of these tendons as a result of severe head injury causes medial thrust of the incus and simultaneous posterior puffing of the stapes head.[8]

Materials used for the reconstruction of ossicular dislocations are cartilage graft, cortical bone, temporalis fascia, silicone splint; however, the mass and shape of the ISJ is altered with these materials. Moreover, tissue adhesives such as cyanoacrylates are also used to repair traumatic dislocation of the incudomalleolar joint, but they cause significant tissue reaction.[4]

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