Traumatic Head Injury with Contralateral Sensorineural Hearing Loss

Dear Editor,

Hearing loss is a known outcome following head injury. Ipsilateral transverse type of temporal bone fracture is commonly associated with sensorineural hearing loss. Labyrinthine concussion is believed to be the mechanism of contralateral profound deafness. Our cases illustrate patients who sustained extradural haemorrhage following a motor vehicle accident with profound sensorineural deafness on the opposite ear.

Case Report 1

A 31-year-old Malay male was allegedly involved in an industrial injury, whereby a piece of metal sheet fell from a crane and hit the roof of the vehicle that the patient was in. An examination revealed left parieto-occipital subgaleal haematoma. A computed tomography (CT) scan of the brain showed left parieto-occipital bone fracture with left posterior fossa extradural haemorrhage (Fig. 1a).

He underwent craniotomy and evacuation of extradural haematoma. When the patient was stable, a full ear, nose and throat (ENT) examination was carried out. Clinically, there was haemotympanum in the right ear. A hearing assessment showed that the patient was having right sensorineural hearing loss. A pure tone audiometry performed confirmed the diagnosis (Fig. 1b). A caloric test showed right canal paresis.

Case Report 2

A 14-year-old Malay boy was allegedly involved in a motor vehicle accident when he was hit by a motorcyclist. He sustained a brief episode of loss of consciousness. An examination revealed that the patient was having right occipital subgaleal haematoma. A CT scan of the brain demonstrated thin right occipital extradural haemorrhage (Fig. 2a). No obvious bony fracture was seen. He was managed conservatively.

A pure tone audiogram showed right high frequency hearing loss and left profound hearing loss (Fig. 2b). Distortion Product Otoacoustic Emission (DPOAE) and Brainstem Evoked Response (BSER) were performed. The results were consistent with left profound sensorineural hearing loss.

Discussion

Hearing loss is common following a head injury. It is more prone to occur if the pathology involves the temporal side of the head, particularly the temporal bone fracture. The type of hearing loss will depend on the type of temporal

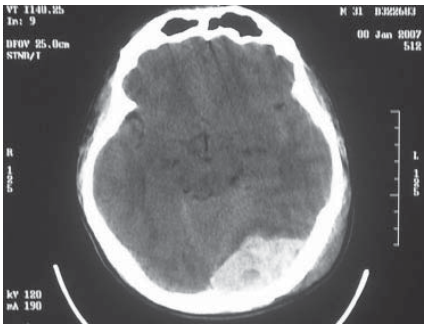

Fig. 1a. Left extradural haemorrhage with subgaleal haematoma.

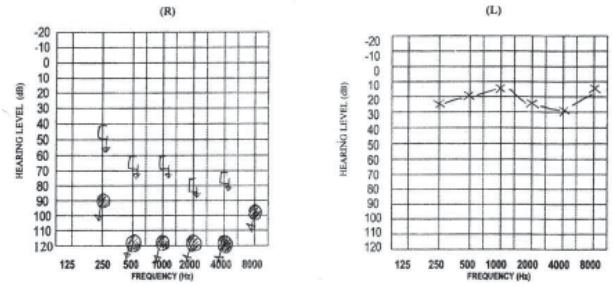

Fig. 1b. Right profound sensorineural hearing loss

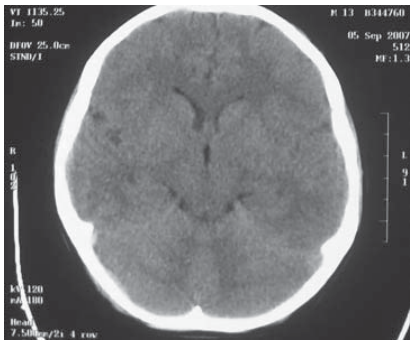

Fig. 2a. Right thin extradural haemorrhage.

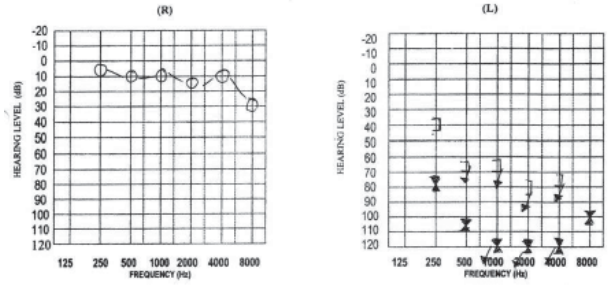

Fig. 2b. Left profound sensorineural hearing loss

bone fracture. According to the traditional classification, a longitudinal fracture causes conductive hearing loss attributed to trauma in the external ear canal, tympanic membrane and ossicular chain. Sensorineural hearing loss tends to develop in the transverse type of fracture because it frequently involves the labyrinth.[1]

Classifying temporal bone fracture using the alternative scheme will determine whether it is a petrous or non-petrous type. Sensorineural hearing loss did not correlate with the transverse fracture classification but was significantly more prevalent in petrous fractures.[2] However, both of these classifications refer to the fracture and hearing loss of the ipsilateral ear.

A contralateral sensorineural hearing loss secondary to the damage of the inner ear structures is a rare occurrence in patients with head injuries. The labyrinthine concussion is postulated to be the underlying mechanism.[3] Three cases of labyrinthine concussion in the opposite ears of patients who had unilateral traumatic temporal bone fractures with facial paralysis have been reported.[4] At their 1-year follow-up, it was observed that the hearing loss persisted.

Chujo et al[5] reported a temporal bone fracture occurring on the side opposite a facial bone fracture. The patient had conductive hearing loss due to ossicular chain injury. During the exploration, they found that the incudo-stapedial joint was separated and the stapes were dislocated.

It seems that head injury can cause both conductive and sensorineural hearing loss on the opposite side of the trauma. As far as we know, there is no report of extradural haemorrhage with opposite sensorineural hearing loss in English literature. Even though it is not common, the possibility of its occurrence needs to be known. A complete examination of the ear without giving less attention to the opposite ear is very important during the management of patients with head trauma.

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