TEMPORAL BONE FRACTURE WITH FACIAL NERVE PALSY

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Introduction

Temporal bone fractures are not uncommon injuries in patients exposed to head trauma. They call for an early diagnosis, including a careful otoneurological examination and thin sections high resolution CT examination. A case of delayed diagnosis of temporal bone fracture with facial nerve paralysis is presented. The aim of the presentation is to highlight the awareness and importance of HRCT of temporal bone in presence of clinical features like damage to 7^{th} and 8^{th} cranial nerves, CSF leak and damage to the middle and inner ear in patients with head trauma.

Case Report

44 year old JCO was found unconscious on road side three months back with bleeding right ear and had passed urine. There was no history of vomiting or seizures. On examination the patient was unconscious with GCS 8/15. He had right hemiparesis with bleed from right ear and CSF leak from right nostril. He regained consciousness within 24 hours and was detected to have right lower motor neuron (LMN) facial nerve palsy (Fig-1) manifested as dribbling of saliva, partial eye closure and inability to frown on right side. There was no hyperacusis and taste sensation in the anterior two third of the tongue. CT scan head showed a left temporal subdural haematoma with mild mass effect. There were multiple small left frontal haemorrhagic contusions and a small right cerebellar contusion with fracture occipital bone. He was put on conservative treatment and showed improvement. A repeat CT done after 10 days showed resolving contusion with minimal edema, there was no shift of midline structures. He continued to show progressive improvement and was sent on 8 weeks sick leave with dysphasia, right hemiparesis and right LMN facial nerve palsy.

On review after sick leave there was subtle weakness of right upper limb. The facial nerve LMN palsy persisted. In addition he had mild neurosensory deafness on the right suggesting labyrinthine injury. He was subjected to HRCT with 1 mm sections for temporal bones which revealed healing linear longitudinal fracture through the right mastoid air cells extending to middle ear without extension to facial canal (Fig-2). The fracture was not detected on earlier 10 mm conventional head CT scans.

Discussion

Waldron and Hurley presented 8 cases seen in a 12 month period in which temporal bone fractures were not diagnosed at presentation inspite of a full clinical examination and skull radiographs. 5 of these cases developed complications which resulted in their referral [1], therefore absence of visible fracture on skull radiograph does not exclude a fracture and those patients with clinical signs of a fracture should be further investigated. The clinical examination is vital in diagnosing temporal bone fracture and must include careful otoscopy together with assessment of function of the seventh and eighth cranial nerves. CT evaluation of the head is also inadequate for evaluation of tempo-

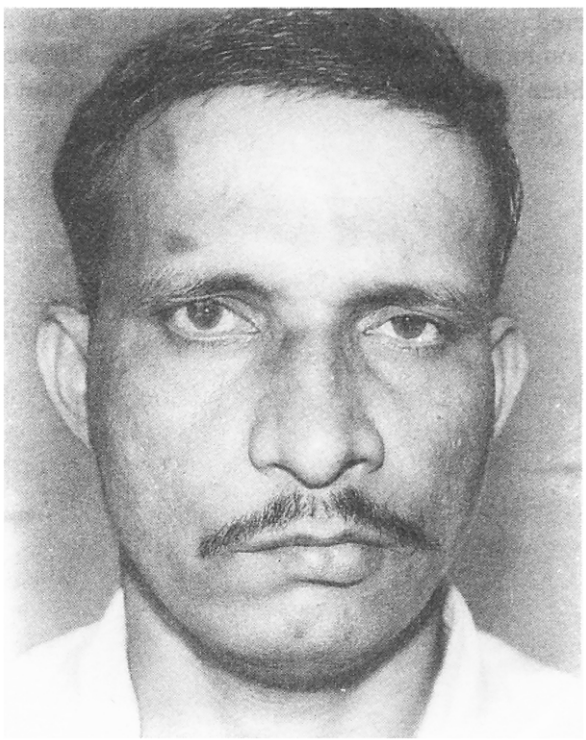

Fig. 1 : (LMN) Facial nerve palsy

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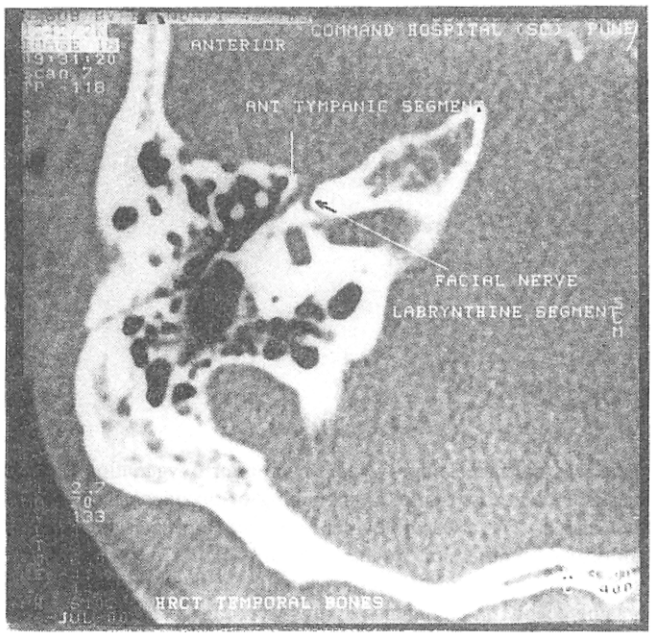

Fig. 2 : Axial HRCT of right temporal bone shows longitudinal fracture through the mastoid air cells extending to middle ear

ral bone fractures. A dedicated high resolution 1 mm CT section should be performed when clinical criterion warrants, it is recognized that the incidence of facial nerve injury may be higher in this select population [2]. Temporal bone fracture may be complicated by damage to seventh and eighth cranial nerves, CSF leaks and damage to the middle and inner ear [2]. Both axial and coronal scan are required, however coronal scan may not be possible in acutely traumatized patient [3]. Petrous temporal bone fractures have been classified as longitudinal, transverse, or mixed. The most common associated injury is to the facial nerve in its geniculate or proximal tympanic segment. On CT, the entire course of facial nerve must be studied searching for fracture fragments or evidence of localized expansion that may indicate intraneural haematoma or edema. Transverse fractures frequently involve the labyrinth. A careful search for various types of ossicular dislocation should be performed in association with temporal bone fracture, because this may result in conductive hearing loss [3].

Valavanis et al reported that high resolution CT demonstrated lesion of the facial nerve canal in 79% of a patient group with traumatic facial nerve palsy. The most frequent site of injury to the facial nerve canal was the region of the geniculate ganglion [4]. One should be knowledgeable about the electrophysiologic diagnosis of facial paralysis and know when to be conservative in facial palsy secondary to head trauma [5]. Ghorayeb and Rafie in a large series of blunt head injuries reported 123 temporal bone fractures. Immediate facial paralysis was observed in 64 patients of which only 11 patients needed facial nerve exploration following signs of denervation, the rest recovered spontaneously. 13 patients who had delayed facial paralysis also recovered spontaneously. Other unusual complications encountered included 6 cases of abducent paralysis, 2 cases of trigeminal paralysis and 2 cases of aseptic sigmoid sinus thrombosis. Occasionally, the fracture does not involve the Fallopian aqueduct and the possibility of a facial palsy may be secondary to contusion or stretching of the nerve [6].

Electron microscopic examination of intratemporal facial nerve segments removed from 12 patients with persisting facial paralysis following temporal bone fractures revealed that traumatic injury at the geniculum induces retrograde degeneration through the labyrinthine and distal meatal segments of the facial nerve. Fibrosis may occur in the traumatized labyrinthine segment and block regenerating motor fibres. The surgical treatment of traumatic facial nerve injuries should be aimed to avoid or eliminate fibrosis within the labyrinthine segment of the Fallopian canal [7].

Temporal bone fracture may be intially missed in patients in whom symptomatology related to temporal fracture is obscured or over looked by much more serious neurologic compromise. High-resolution CT is the imaging modality of choice for topographic evaluation of temporal bone fractures, detection and precise localization of fracture complications.

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