http://www.pjbs.org

PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 12 (5): 476-479, 2009
ISSN 1028-8880

Transient Facial Nerve Baroparesis: Case Report

M.M. Ardehali, N. Yazdani and M. Heidarali
Otorhinolaryngology Research Center, Tehran University of Medical Sciences, Tehran, Iran

Abstract: We present a rare case of facial paralysis that was unusual not only in its causation but also in its rapidity of onset and recovery. We describe a rare case history of this accruing in 35 years old women traveling at the high altitude mountain road referred to ENT clinic with sudden symptoms of middle ear effusion and facial nerve paralysis. Patient had undergone medical systemic steroid treatment and after 3-4 weeks she had a good recovery of facial palsy with a minimum remnant of sensory neural hearing loss. Facial nerve paralysis resulting from a barotrauma of the middle ear is suggested. The correct diagnosis of this condition is important and unnecessary treatment should be avoided.

Key words: Barotrauma, neurological manifestations, facial palsy, middle ear

INTRODUCTION

Otic barotrauma occurring during air travel involves traumatic inflammation of the middle ear, caused by a pressure difference between the air in the middle ear and the external atmosphere, developing after ascent or more usually descent. The pressure difference occurs because of failure of the eustachian tube to equilibrate middle ear and atmospheric pressures (Mirza and Richarson, 2005). Barotrauma (tissue injury resulting from pressure differences) results from failure of ambient pressure to equalize the pressure in air contained chambers such as the ears and sinuses.

If the cavity is unable to communicates with the upper airway or unable to equalize the pressures, injury is likely to occur. There were 27 cases of barotraumatic facial palsy in the medical literature till 2004 that 23 numbers of them were from diving and 4 were flying (Hyams *et al*., 2004). Depending on its magnitude, the pressure difference can cause mucosal edema, contusion, hemorrhage or separation of the mucosa from the periosteum. This can lead to majority of problems in any system and also causes neurological disorders such as nerve compression (Awada and Suleiman, 2003). The Most barotraumatic injuries of the ear and sinus result from diving with nasal congestion, but are self-limiting or require only analgesic medication (Parell and Becker, 2000). Symptoms are relieved by pressure equalization tubes or other means of improving the eustachian tube function. This is a report of a rare case of barotrauma of the middle ear because of unusual complications and natural course of recovery discussing the possible mechanism of its cause, presentation and management.

CASE REPORT

A 34-year-old white female was referred to the ENT Department complaining of sudden facial palsy and pain on the right side of her ear from 3 days ago with history of traveling at a high altitude mountain road. The pain was associated with hearing loss and vertigo on movements of the head. There were no throat symptoms, shortness of breath, chest/calf pain or fever. She had a negative history of smoking and alcohol drinking. There was no previous history of facial palsy and ear diseases in her all previous travels. Physical examination showed a near-complete facial paralysis over the right side of the face. Tympanic membrane which felt retracted was not associated with erythema or hemotympanom. There was no associated laryngopharyngitis and nasal discharge (Fig. 1). Other ENT examination was unremarkable. Initial full blood count and laboratory tests showed a normal value. In audiologic evaluation a tympanogram of B type in right ear is noted which was associated with a mixed hearing loss and 20 db gap in all frequencies and a sensory loss peak in 4000 Hz. A high resolution spiral CTscan of temporal bone showed a soft tissue density that is noted in right middle ear which creating a small air-fluid level foci. There is no evidence of bony wall erosion. The middle ear's ossicles are visualized normally. The semicircular canals, cochlea, internal auditory meatus and external ear canal are seen normal in both sides. These findings suggest that otitis media in right side should be considered (Fig. 2a, b). She was begun on prednisolon tablet (1 mg kg^{-1}) and advised to continue it for two

Corresponding Author: M.M. Ardehali, Otorhinolaryngology Research Center, Tehran University of Medical Sciences, Tehran, Iran

Fig. 1: A near-complete facial paralysis over the right side of the face (before treatment)

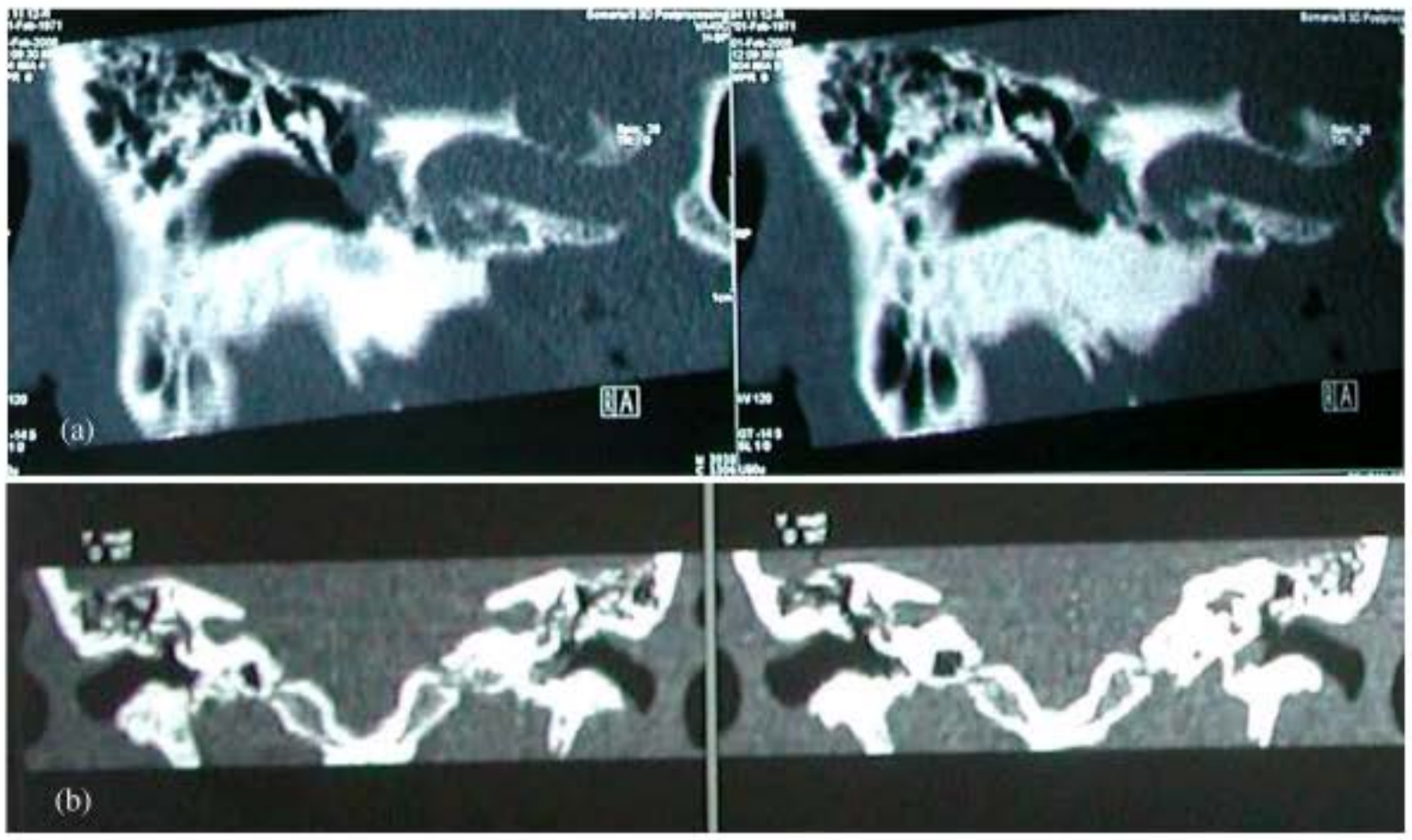

Fig. 2: (a) CT scan of temporal bone showed a soft tissue density that is noted in right middle ear which creating a small air-fluid level foci suggesting otitis media in right side. (b) CT scan of temporal bone (Coronal view)

Fig. 3: After treatment

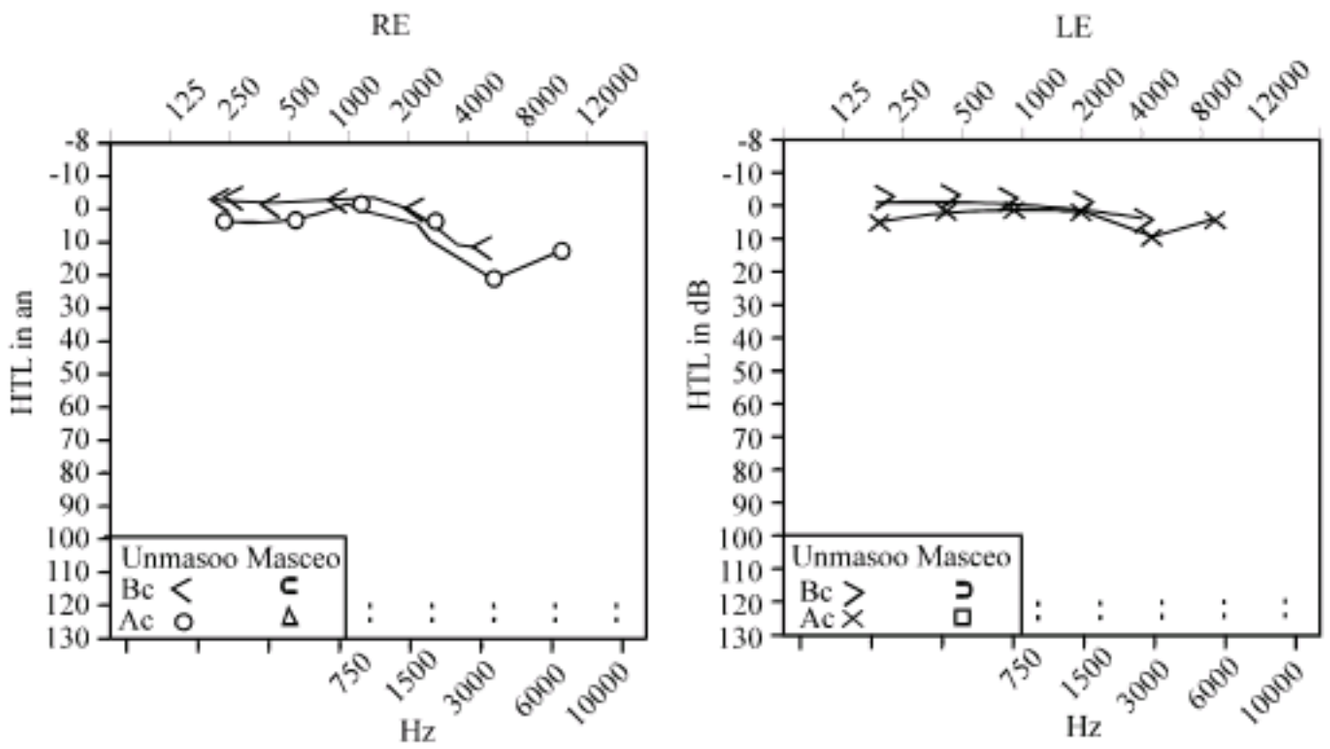

Fig. 4: Audiologic evaluation after recovery

weeks. After an over 4 weeks follow-up, facial paralysis over the right side of face and right middle ear effusion resolved completely but hearing loss was not fully recovered (Fig. 3, 4).

DISCUSSION

Otic barotrauma may occur to the external, middle and inner ear. Earplugs, cerumen impaction or tight fitting diving hoods are common causes of external ear blockage. Barometric facial paralysis seems to be related to pressure changes in the middle ear transmitted directly to the facial nerve through natural dehiscences in the fallopian canal. Other studies have also shown that Dehiscence of the facial nerve in intra-mastoid portion occurs in 0.5 to 75% of temporal bone. In comparison to the other studies the lower dehiscence incidence being found intra-operatively (Hyams *et al*., 2004). Several authors have described a serious phenomenon of recurrent facial paralysis with changes in barometric pressure. Facial paralysis in some occasion such as ascending in car or during flights on commercial aeroplanes has been reported (Woodhead, 1988; Motamed *et al*., 2006). Symptoms reversed on descent. Similar cases have been reported after commercial airline flights and after scuba diving (Becker, 1983; Eidsvik and Molvoer, 1985; Silverstein, 1986). A brief facial palsy also has been reported after forceful nose blowing (Onundarson, 1987).

In this case, a transient facial nerve baroparesis was present, but is unilateral and reversible. This is due to an over pressure of the ear compressing the horizontal portion of the facial nerve. All of the ear barotraumatic patients should be referred to an Otolaryngologist immediately for evaluation and treatment. There were a few cases of facial baroparesis due to its cause and the presentation in the medical literature. From 27 cases with barotraumatic facial palsy were reported till 2004 most of them were resolved (Hyams *et al*., 2004). Given the aetiology of facial palsy if rapid solution does not accrue as in our case or patient has a major complication such as sensory hearing loss, steroid treatment should be considered. Observation and advice to avoid swimming, diving or any change in barometric pressure until the problem healed must be taken. Other treatments include decongestants, antihistamines, analgesics and antibiotics on an individual basis for signs of infection and moderate. Unfortunately, in this case minimal sensory hearing loss was remained even after full dose steroid therapy which is might be due to irreversible damage to cochlear sensory structure.

REFERENCES

Awada, A. and K. Suleiman, 2003. Neurological disorders and travel. Int. J. Antimicrob. Agents, 21: 189-192.

Becker, G.D., 1983. Recurrent alternobaric facial paralysis resulting from scuba diving. Laryngoscope, 93: 596-598.

Eidsvik, S. and O.I. Molvaer, 1985. Facial baroparesis: A report of five cases. Undersea Biomed. Res., 12: 459-463.

Hyams, A.F., S.C. Toynton and M. Jarmillo, 2004. Facial baroparesis secondary to middle-ear over-pressure: A rare complication of scuba diving. J. Laryngol. Otol., 118: 721-723.

Mirza, S. and H. Richardson, 2005. Otic barotrauma from air travel. J. Laryngol. Otol., 119: 336-370.

Motamed, M., H. Pau and A. Daudia, 2006. Recurrent facial nerve palsy on flying. J. Laryngol. Otol., 114: 704-705.

Onundarson, P.T., 1987. Acute nose-blow palsy: A pneumatic variant of sudden facial paralysis. N. Engl. J. Med., 317: 1227-1227.

Parell, G.J. and G.D. Becker, 2000. Neurological consequences of scuba diving with chronic sinusitis. Laryngoscope, 110: 1358-1360.

Silverstein, H., 1986. Facial paralysis associated with air flight. Am. J. Otol., 7: 394-395.

Woodhead, C.J., 1988. Recurrent facial palsy at high altitude. J. Laryngol. Otol., 102: 718-719.