

Unilateral Temporal Bone Fracture with Traumatic Bilateral Facial Nerve Palsy

Travmatik Bilateral Yüz Sinir Palsili Tek Taraflı Temporal Kemik Kırığı

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ABSTRACT

Bilateral traumatic facial nerve paralysis rarely occurs. Unlike unilateral facial nerve paralysis, bilateral facial nerve paralysis is difficult to diagnose and sometimes missed due to lack of facial asymmetry. Evidence of temporal bone fracture on imaging with high index of suspicion will lead to a thorough physical examination to accurately diagnose a bilateral facial nerve paralysis. We reported a case of a 32-year-old lady who had traumatic bilateral facial nerve paralysis after a motor vehicle accident. Computed tomography scan showed a left temporal bone fracture involving facial canal with no evidence of fracture on contralateral side. The dilemma in managing a complex traumatic facial nerve palsy, the decision of surgery, timing and the successful result of the surgery are discussed.

Keywords: Bilateral facial nerve paralysis; traumatic palsy; facial nerve decompression

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ÖZET

Bilateral travmatik fasiyal sinir felci nadiren görülür. Tek taraflı fasiyal sinir paralizinin aksine, bilateral fasiyal sinir paralizisinin teşhisi zordur ve bazen fasiyal asimetri eksikliği nedeniyle gözden kaçır. Yüksek şüpheli indeksi ile görüntüleme temporal kemik kırığı kanıtı, bilateral fasiyal sinir felcini doğru bir şekilde teşhis etmek için kapsamlı bir fizik muayeneye yol açacaktır. Bir motorlu araç kazası sonrası travmatik bilateral fasiyal sinir felci geçiren 32 yaşında bir bayan hastayı sunduk. Bilgisayarlı tomografi taraması, karşı tarafta hiçbir kırık kanıtı olmayan yüz kanalını içeren bir sol temporal kemik kırığı gösterdi. Karmaşık bir travmatik fasiyal sinir felci tedavisinde ikilem, ameliyat kararı, zamanlama ve ameliyatın başarılı sonucu tartışılmaktadır.

Anahtar Sözcükler: Bilateral fasiyal sinir felci; travmatik felç; yüz siniri dekompresyonu

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INTRODUCTION

Facial nerve paralysis (FNP) may occur due to traumatic or non-traumatic causes. Head trauma resulting in FNP accounts for 17% of all causes of facial nerve paralysis (1) and it can be either immediate or delayed in onset (2). Seven to ten percent of traumatic temporal bone fractures (TBF) may lead to FNP (3, 4). TBF is classified into three types: longitudinal, transverse and mixed type, based on the long axis of the petrous bone (3). The longitudinal fracture of the temporal bone is more common, accounts for 80% of all TBF but the FNP only occur in 10-20% of these. While the transverse fractures accounts for 20% of fractures with higher incidence of FNP, which is 50% (5). Traumatic FNP may result from nerve compression by hematoma or bony spicule, or nerve transection by the fracture line itself (6). Majority of the unilateral TBF cases will present with unilateral and ipsilateral FNP. One would expect bilateral FNP as a result of bilateral TBF. We would like to discuss an interesting case of a bilateral FNP in a unilateral TBF.

CASE REPORT

A 32-year-old lady was involved in a motor vehicle accident and sustained brief loss of consciousness, retrograde amnesia and left ear bleeding. She was initially admitted to nearest tertiary hospital and a plain computed tomography (CT) scan of brain was performed which showed a longitudinal left TBF with suspected left facial canal involvement. There was no evidence of intracranial hemorrhage. She also had left clavicle and left 4th and 5th ribs fractures. Ear examination showed left hemotympanum with normal right tympanic membrane. On second day of admission, she developed bilateral facial weakness, which was noticeable when taking orally. The initial documented FNP grade was House-Brackmann (HB) grade 2 bilaterally. Patient was started on intravenous (IV) Dexamethasone for three days. Nevertheless, the bilateral FNP gradually worsened to HB grade 4 on day 3 post trauma. A therapeutic myringotomy of left ear was then performed to drain the hemotympanum, but the bilateral FNP persisted.

Patient was transferred to our center, the state hospital, on day 5 post trauma due to logistic reason. During the admission, the FNP had worsened to HB grade 5. Patient denied reduced hearing or tinnitus but had occasional vertigo. On examination, there was no obvious asymmetry of face at rest, however there was perceptible motion at gross movement. Patient was expressionless whereby she was unable to wrinkle bilateral foreheads, unable to close both eyes completely on maximum effort and had loss of bilateral nasolabial fold. The otoscopic examination showed small central perforation of the left tympanic membrane with dry blood clots seen in the left ear canal. Right ear and other cranial nerves examinations were normal. Pure tone audiometry showed left mild to moderate conductive hearing loss and normal hearing in the right ear. We were unable to perform the electroneurography (ENoG) test as patient had bilateral facial nerve palsy.

She was started on tapering dose of tablet Prednisolone 1mg/kg/day, oral Amoxicillin-Clavulanic acid 625mg BD for one-week, artificial eye drops and tablet Neurobion (combination of B1, B6 and B12 vitamins). High resolution CT (HRCT) scan of temporal bone showed left temporal bone fracture involving the petrous part, along with anterior ear canal and middle ear resulting in comminuted fracture of the tegmen tympani. The left facial canal was obscured by hematoma in the attic and surrounding ossicles. There was no evidence of temporal bone fracture on contralateral side (Figure 1).

Upon completion of the oral prednisolone, the bilateral FNP improved from HB grade 5 to grade 4. Three months' post-trauma, the right FNP improved to HB grade 2 but the left side remains at HB grade 4. Patient was counselled for surgery and agreed for left facial nerve exploration and decompression. The surgery was performed at 14 weeks post trauma. Intraoperatively, there was a bony spicule compressing on the facial nerve at the second genu. The facial nerve was edematous and decompression was performed to release the edema (Figure 2). One-month post-surgery, the left FNP improved to HB grade 3. Four months later, left FNP improved to HB grade 2 with HB grade 1 on right side.

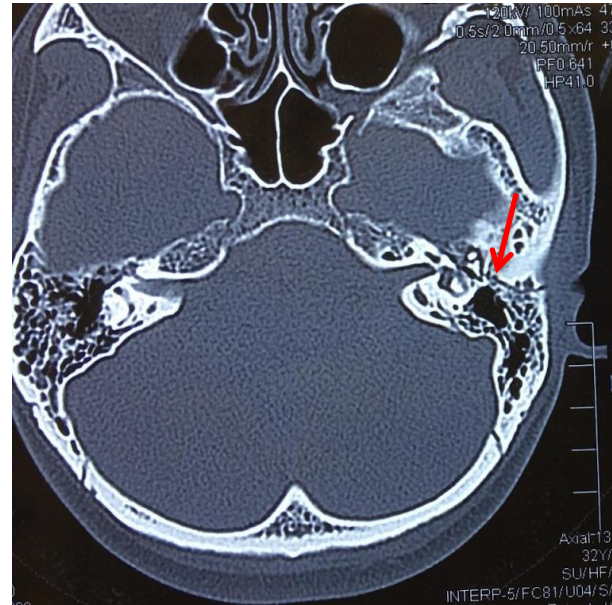


Figure 1: HRCT Temporal bone of patient: Red arrow indicating the fracture line.

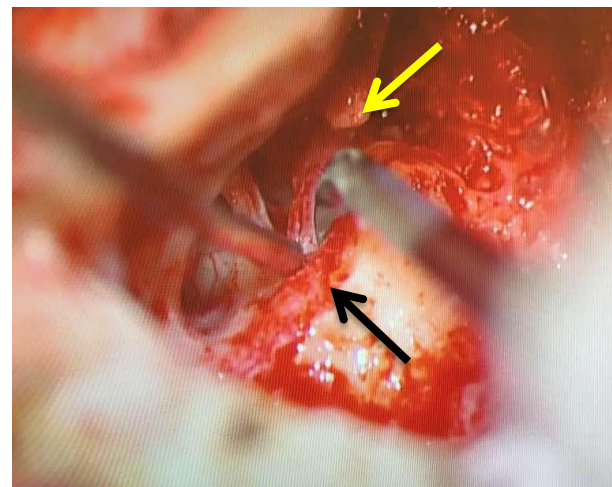


Figure 2: Intraoperative findings: Black arrow is showing the left facial nerve. Yellow arrow is pointing to short process of left incus.

DISCUSSION

Bilateral traumatic FNP is rare, especially in a unilateral fracture like in this patient. Few cases were reported in the literature on bilateral FNP which were due to bilateral temporal bone fracture (7, 8). Nevertheless, it is important to highlight that HRCT scan is not 100% accurate in diagnosing a temporal bone fracture. A recent study by Chen et al demonstrated that HRCT temporal is unreliable in revealing the damage of fallopian canal at the posterior genu and mastoid segment (9). Thus, a fracture on the other side of temporal bone might be missed, which may cause edema or compression to facial nerve leading to bilateral facial nerve palsy. Rotondo et al suggested that when a traumatic FNP occurs without CT evidence of temporal bone fracture, magnetic resonance imaging (MRI) is mandatory (2). However, it was not performed in our case as the FNP on the no-fracture side was improving.

In traumatic FNP, ENoG will be helpful in deciding the need for surgical decompression. However, the nerve function must be compared to the normal side. If the result showed facial nerve degeneration of 90% or more within 6 days of the onset of paralysis, it is predictive of poor recovery unless decompression is performed (10). In our case, it is difficult to measure the degeneration of the nerve as ENoG was unable to be performed due to the bilateral involvement. The decision on surgical intervention was based on clinical judgement during follow up of the patient when the left facial nerve palsy did not improve. Surgical intervention was carried out at 14 weeks post trauma which was considered late by most authors. It has been suggested that early intervention need to be performed by 2 weeks post trauma and as late as 3 months for good prognosis of the facial nerve recovery (6, 11, 12). However, in this patient, we found that late surgical intervention (after 3 months) also bring a good outcome to the facial nerve recovery, which was similar to findings by GZ Sanus et al (13). The above discussion is controversial, however, it is crucial to note that an immediate and complete facial nerve palsy is an indication for urgent facial nerve decompression (10).

CONCLUSION

A facial nerve injury, either unilateral or bilateral must always be suspected in temporal bone fracture. Although bilateral facial nerve paralysis is rare and may occur in a negative HRCT temporal bone, it warrants a thorough clinical examination to diagnose. Early surgical intervention is recommended but late facial nerve decompression in traumatic injury may also carries a good prognosis in facial nerve recovery.

Conflict of interest

No conflict of interest was declared by the authors.

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