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Simultaneous bilateral traumatic facial palsy with different treatment protocols

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ABSTRACT

INTRODUCTION: Bilateral simultaneous facial palsy is a rare clinical entity. Traumatic origin is even rarer. Long-term sequelae are disabling. Therefore, rapid and adequate management is crucial.
CASE PRESENTATION: Herein we present a case report of a traumatic bilateral facial palsy in a 43 years old male treated with surgery in one side and conservative treatment in the other side. He achieved eye closure at his 10 months follow up.
DISCUSSION: Electroneurography showing more than 90 % of facial nerve degeneration and electromyography revealing no regeneration potentials are identified as surgical indications.

The perigeniculate region is the most commonly injured portion of the facial nerve with temporal bone fractures. Surgical approach to this area remains controversial; transmastoid, middle fossa craniotomy or a combination of both.
CONCLUSION: It is important to discuss expectations with the patient as it might take 12 months to regain maximal nerve function.

1. Introduction

Bilateral simultaneous facial palsy is a very rare condition. Its incidence is one per 5 000 000 per year [1]. The facial nerve is affected in 7–10 % of temporal bone fractures [2]. Long-term sequelae of temporal bone fractures are disabling and significantly impair patient's quality of life. Therefore, rapid management of facial nerve palsy is crucial to avoid permanent facial deformity.

We present a case report of a traumatic bilateral facial palsy in a 43 years old male treated with surgery in one side and conservative treatment in the other side. The work has been reported in line with the SCARE criteria [12].

2. Case presentation

We report a case of a 43 years old man who was admitted in the emergency room for a head trauma following a motor vehicule accident. The patient was conscious and stable. Head CT scan did not show any brain injury. It showed bilateral temporal bone fractures. He had no personal or family medical history. Physical examination revealed acute onset of bilateral facial palsy; Grade IV in the right, Grade V in the left (House-Brackmann (HB)) scale), with bilateral hemotympanum. Temporal bone CT scan revealed bilateral extra-labyrinthine transverse fracture reaching the facial canal in the right ear (Fig. 1). Ossicular chain, cochlea and vestibule were intact. Pure tone audiometry revealed a mild conductive hearing loss 34 dB in both ears. Electromyography showed a very severe axonal injury in the left side with abolition of amplitudes and voluntary polyphasic reinnervation potentials in the right side. He was started on oral steroids with physical therapy. After three weeks of conservative measures, the right side improved to a grade III whereas the left side remained unchanged (Fig. 2). Surgical exploration was performed five weeks after injury by a senior otologist. Through a transmastoid approach, the main findings were edema of the tympanic portion and perigeniculate region and compression by a bony fragment. At his 10 months follow up, he achieved a grade III in the left side and a grade II in the right (Fig. 3). He was aware of the long recovery period and was compliant with rehabilitation. Hearing level remained stable after surgery.

3. Discussion

It is reported that 9%–20 % of temporal bone fractures are bilateral [3]. The facial nerve is affected in 7–10 % of temporal bone fractures [2]. While unilateral traumatic facial nerve palsy is common, simultaneous bilateral facial palsy remains unusual.

Darrouzet et al. in a series of 115 traumatic facial paralyses reported only two cases with bilateral facial paralysis [4].

Simultaneous bilateral facial palsy can be defined as palsy affecting both hemifaces within four weeks [5].

According to Gaudin [6], the common etiologies of bilateral facial palsy are Bell's palsy (one-third of bilateral facial paralysis

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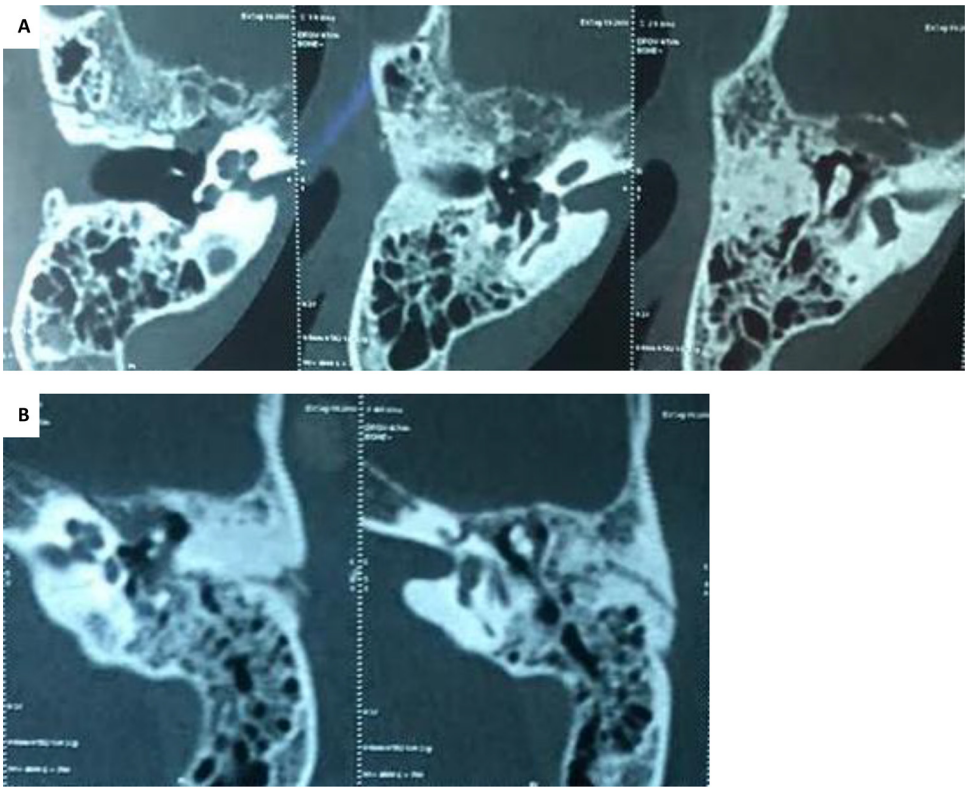

Fig. 1. Bilateral transverse fracture of the temporal bone radiating to the facial canal. A) Right temporal bone. B) Left temporal bone.

Fig. 2. Bilateral facial palsy: Grade 5 in the left and 3 in the right side.

Fig. 3. 10 months follow up; the patient achieved a grade 2 in the right and a grade 3 in the left side.

cases), Lyme disease, Mobius syndrome, Guillain-Barre syndrome, benign neoplastic processes (ie, neurofibromatosistype2), vascular malformations, and trauma.

Clinical diagnosis can be challenging especially in unconscious patient. However, it is critical for prognosis and management to distinguish between immediate and delayed onset of facial paralysis. The House Brackmann (HB) scale is the standard for grading degree of facial paralysis, as the extent of facial weakness is also important for therapeutic decision [7].

Historically, Ulrich divided temporal bone fractures into longitudinal, transverse or mixed fractures, based on the relation of the fracture line with the axis of the petrous bone [8]. The past decade, authors introduced a new classification that correlates fracture geometry with clinical outcomes. The classification as otic capsule–violating (OCV) versus otic capsule–sparing (OCS) has been the most predictive of clinical outcome [9]. In a retrospective review of 820 temporal bone fractures, facial nerve paralysis occurred in 48 % of OCV fractures versus only 6% in OCS fractures [10].

In this case, both fracture lines were transverse and otic capsule sparing but still reached facial canal.

Electrodiagnostic testing is often used to further characterize facial nerve injury. Ulug and Arif Ulubil advocate the early use of electroneurography (ENoG) in the first 6 days after the onset of facial paralysis [1]. Electromyography (EMG) is useful when more than 2 weeks have passed after the onset of paralysis. ENoG showing more than 90 % of facial nerve degeneration and EMG revealing no regeneration potentials are identified as surgical indications [2].

The dilemma is when to operate and what surgical approach to use. Treatment protocols are generally based on onset of facial weakness (immediate or delayed) and extent of facial weakness [2]. Facial nerve surgery is indicated in the event of a combination of clinical findings (immediate complete facial paralysis), tomodensitometric findings (facial canal injury), and electrophys-

iological factors (denervation greater than 90 %) [3].In case of incomplete paralysis and presence of voluntary polyphasic reinnervation potentials on EMG, a conservative approach can be adopted using steroids and eye care [2,7].

Due to non availablity of ENoG, surgical decision was based on non-progression of clinical status and absence of regeneration potentials on EMG in the left side. Whereas the presence of voluntary polyphasic reinnervation potentials was an indicator of nerve regeneration in the right side.

Surgical approach also remains controversial; transmastoid, middle fossa craniotomy or a combination of both. It should be selected based on the suspected location of lesion and patient's hearing status. When serviceable hearing is absent, the labyrinthine and geniculate areas of the facial nerve can be exposed by a translabyrinthine approach [7].

The perigeniculate region is the most commonly injured portion of the facial nerve is best accessed with the middle fossa craniotomy [7].

In a case series including 141 patients, the perigeniculate area was involved in 84 % of fractures [11].

Vajpayee et al. [2] reported in their case series of 10 facial decompressions that granulation tissue, edema and compression by multiple bone chips were the main intraoperative findings with the geniculate ganglion region being the most common site of injury.

In our department, we manage decompressive surgery by a transmastoid approach as it is safe and effective. We approach the perigeniculate area after dislocation of the incudo malleolar joint with subsequent ossiculoplasty using autologous incus.

Honnurappa et al. had good surgical outcomes using a transcanal approach as 120 of 141 (92 %) showed grade 2 or 1 post-operative scores. 80 % of the grade 6 and 5 patients ended with a grade 2 and 1, while 13 % of these most affected patients ended with grade 6 or 5. They concluded that patients presenting with grade 6 had worse outcomes than those presenting with grade 5 or 4 [11].

4. Conclusion

Bilateral traumatic facial paralysis is a challenging condition. We presented in this case report both conservative and surgical management based on clinical evolution and EMG findings.

There is controversy regarding indications, timing and choice of approach in the management of traumatic facial nerve paralysis. It is important to discuss timing and expectations with the patient, keeping in mind that the return of maximal facial nerve function may be delayed up to 12 months.

Declaration of Competing Interest

None.

Funding

None.

Ethical approval

The study is exempt from ethical approval in our institution as it is a "Case report" and not a research study.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

H. Ardhaoui: Investigation, Resources, Writing – original draft, Writing - Review & Editing, Visualization. S. Halily: Investigation, Resources, Writing - Review & Editing. **R. Abada:** Validation, Supervision. **S. Rouadi:** Validation, Supervision. **M. Roubal:** Validation, Supervision. **M. Mahtar:** Validation, Supervision.

Registration of research studies

This is a Case report that does not require a research registry.

Guarantor

H. Ardhaoui, S. Halily.

Provenance and peer review

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