

Facial Nerve Paralysis and Superficial Temporal Artery Pseudoaneurysm; Sequelae after Mandibular Fracture

Tyler Pluchino, MD, Jerry Lin, MD, PhD

University of Louisville, School of Medicine, Department of Otolaryngology – Head and Neck Surgery and Communicative Disorders

Introduction

- Facial nerve paralysis is a known consequence after temporal bone fracture. Extensive documentation in the literature describes the perigeniculate region as the most common location of facial nerve paralysis after temporal bone fracture.¹
- Less commonly mandibular fractures have been known to cause a facial nerve injury with proposed mechanisms including edema of the fallopian canal, hemorrhage around the facial nerve in the region of the parotid, or direct trauma from fracture.²
- A paucity of data regarding concurrent injury of both the facial nerve and the external carotid artery remains³. We discuss a rare case of mandibular fracture leading to facial nerve paralysis and superficial temporal artery (STA) pseudoaneurysm.

Case Presentation

A 29-year-old male presented to the University Hospital after a high-speed motor vehicle collision. Upon arrival to the trauma bay at the emergency department, primary and secondary survey was performed. He had a Glasgow-Coma score of 15 and was sent for CT imaging. As imaging proceeded, he became hypotensive, tachycardic, and began hemorrhaging from the left ear.

Balloon tamponade with an occlusive dressing and endotracheal intubation was performed, he was sent back for imaging. Maxillofacial and temporal bone CT imaging showed multiple facial fractures including left subcondylar, right parasymphysis, LeFort I, and a left anterior external auditory canal fracture; the remainder of his left temporal bone and ossicles were intact. Angiography of the left external carotid artery was performed which identified a left superficial temporal artery pseudoaneurysm which was successfully coil-embolized. The following day after presentation he was noted to have diminished corneal reflexes on the left compared to the right. He was taken to the operating room for open reduction and internal fixation of his facial fractures and remained in rigid fixation for the subcondylar fracture.

6 days after presentation, electroneurography was performed which confirmed complete left facial nerve palsy, House-Brackmann VI/VI. High dose steroids were started, and decompression of the facial nerve was planned; however, he developed an acute otitis externa. He was seen outpatient 2 months after his initial injury and remained without facial nerve function. 3 months after injury, he underwent left canalplasty, mastoidectomy, and vertical facial nerve decompression with improvement of the cervicofacial branches of the facial nerve, House-Brackmann IV/VI.

Results

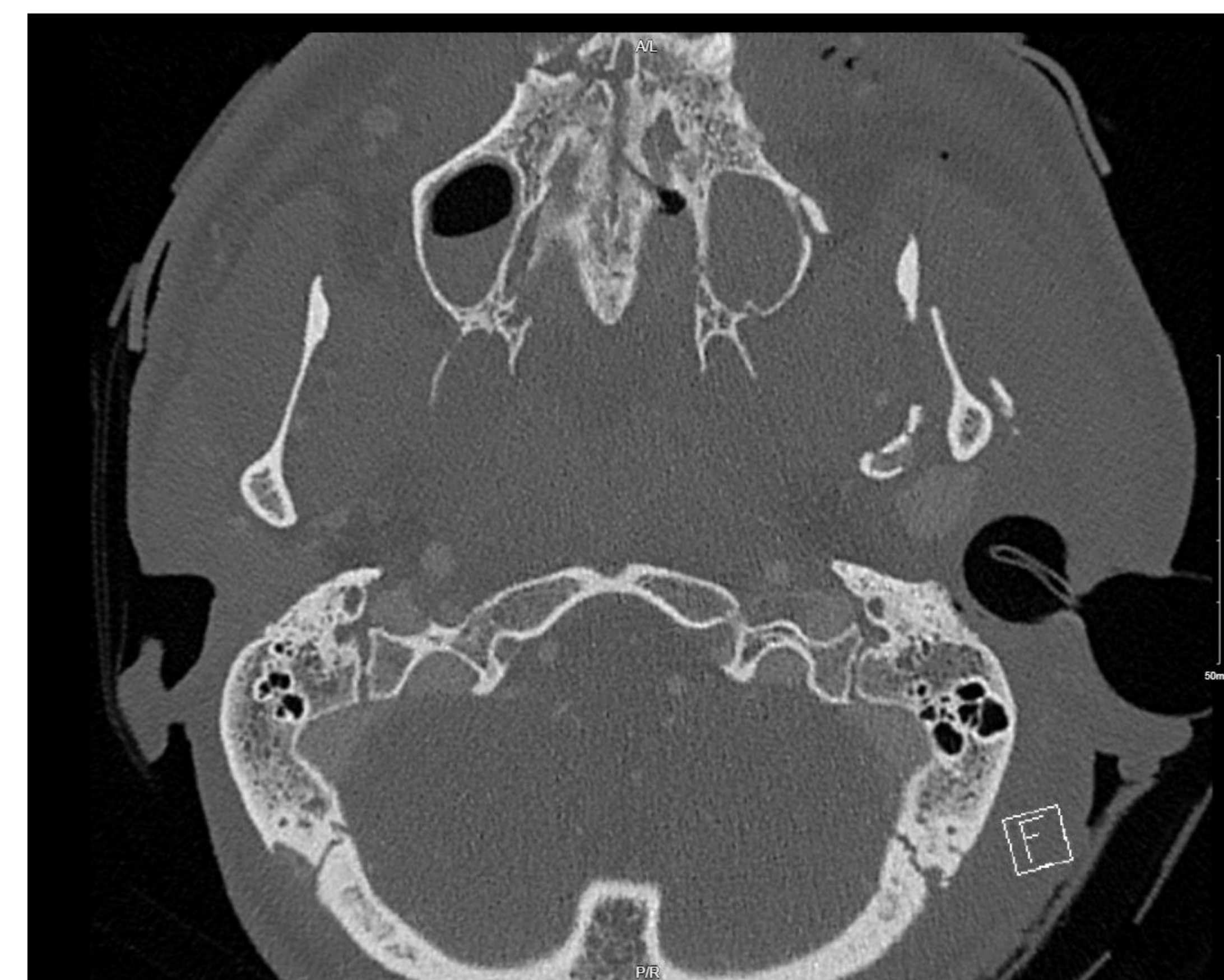


Figure 1A: Axial CT Imaging (Obtained on admission)



Figure 1B: Coronal CT Imaging (Obtained on admission)

Nerve Conduction Studies Motor Summary Table

Stim Site	NR	Onset (ms)	O-P Amp (mV)
Left Facial - Nasalis			
Mastoid	*NR		*No response
Right Facial - Nasalis			
Mastoid		2.8	1.7
submax stim		2.8	1.4

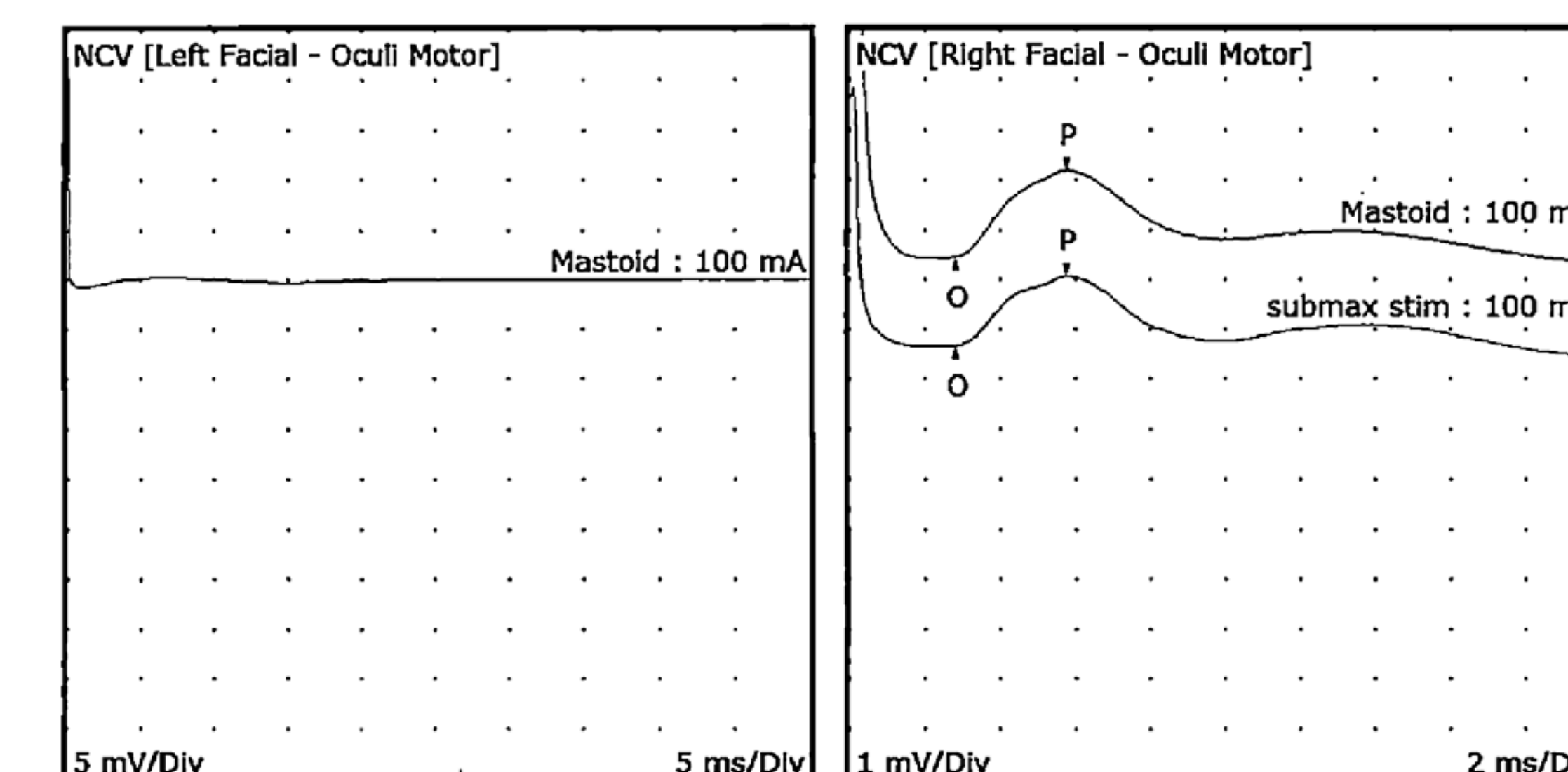


Figure 2: Electroneurography(ENoG) (Performed 6 days after injury)



Figure 3: 6 Months After Facial Nerve Decompression

Discussion

- Pseudoaneurysm of the superficial temporal artery is a rare event that requires prompt diagnosis and treatment. Traditionally open surgical ligation was treatment of choice, but endovascular intervention is a viable option for improved recovery time and cosmesis⁴
- When to intervene upon a facial nerve injury can be controversial, especially when to perform decompression. Some studies recognize that surgical decompression within 3 months of injury allows for a good recovery rate, deemed HB 2 or better.
- In this patient, there was initial suspicion that facial nerve paresis was due to pseudoaneurysm resulting in vascular insufficiency to the nerve, since the nerve within the parotid gland receives blood supply from the STA.⁵ However, delayed decompression still allowed for improvement in the lower branches of the nerve
- Potential causes for the remaining loss of function within the temporal branch of the facial nerve include the subcondylar fracture, pseudoaneurysm of the STA, or sequelae after performing endovascular embolization for the STA.

References

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