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Case Report

Traumatic facial nerve injury: A case of facial nerve avulsion at the cerebellopontine angle[☆]

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ABSTRACT

Post-traumatic facial nerve paralysis is a common disease, but intracranial facial nerve injury after blunt injury has rarely been reported. We report a case of facial nerve avulsion at the cerebellopontine angle. A 23-year-old female with incomplete right-sided facial nerve palsy and facial spasms presented to our hospital. She had a history of traumatic injury, having fallen off a table and hit her head at the age of 2 years. After the accident, she developed complete right-sided facial nerve palsy and underwent conservative treatment with steroids. A magnetic resonance imaging examination performed 21 years later showed avulsion of the facial nerve at the cerebellopontine angle. Magnetic resonance imaging targeting the facial nerves might provide additional information to computed tomography in cases with poor recovery with conservative treatment.

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Introduction

Facial nerve paralysis is a common disease, and the second most common cause in pediatric patients is trauma [1]. It usually occurs after blunt injury to the cranium with temporal bone fractures [2,3]. A common injury site is the facial nerve canal between the entry at the lateral terminus of the internal auditory canal and the exit at the stylomastoid foramen [3,4]. Computed tomography (CT) examinations are often per-

formed to investigate the site of the bone fracture, bony fragments, and the presence of a hematoma. However, CT cannot visualize the facial nerve itself.

Magnetic resonance imaging (MRI) allows direct evaluation of the injured facial nerve, thereby providing supplementary information. There are some reports of MRI of post-traumatic facial nerve palsy with abnormal enhancement [5,6]. However, less is known about cases with facial nerve avulsion [3,4]. We report a case of facial nerve injury, in which facial nerve avulsion was observed 21 years after the trauma.

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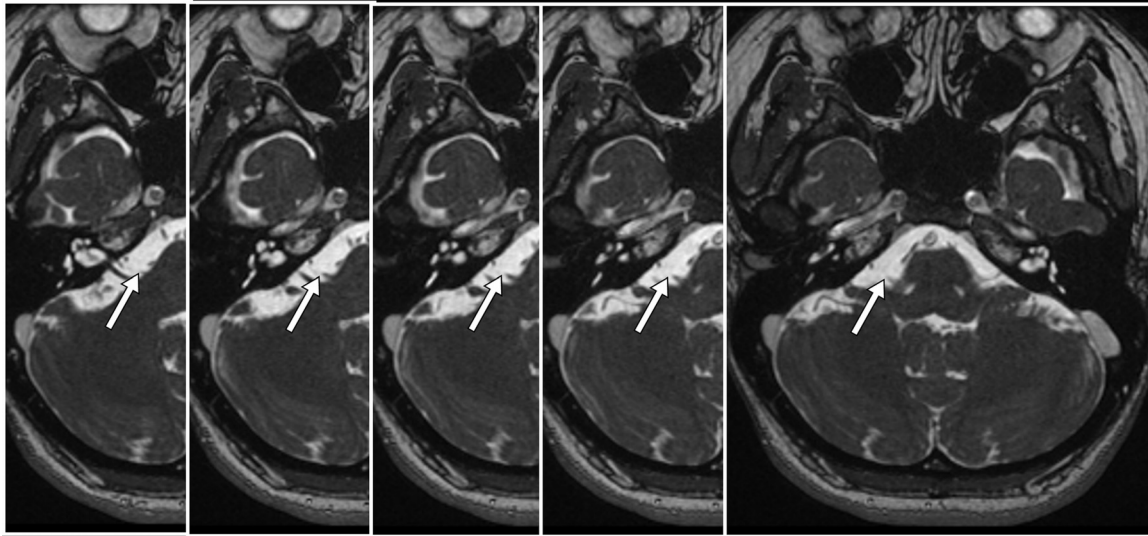


Fig. 1 – Fast imaging employing steady-state acquisition shows the right facial nerve avulsion at the right cerebellopontine angle (arrows).

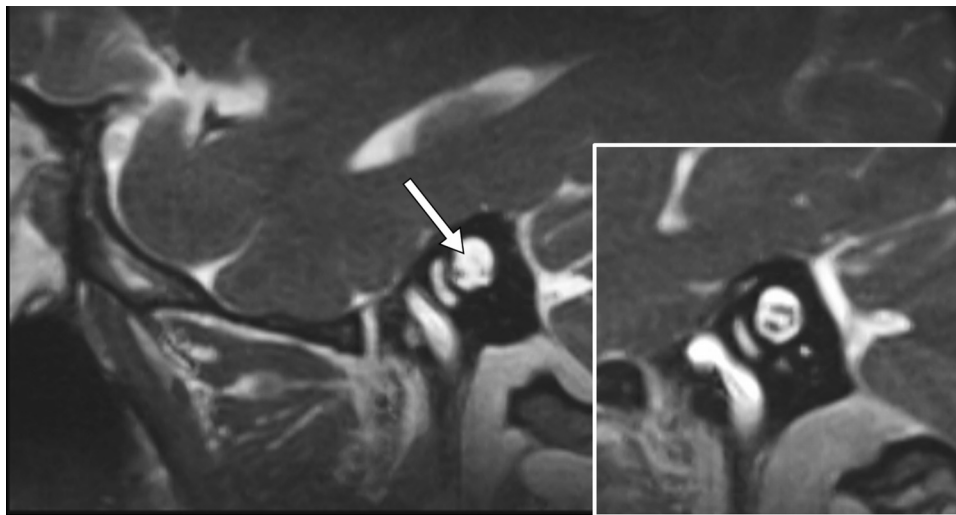


Fig. 2 – Fast imaging employing steady-state acquisition shows the absence of the right facial nerve in the right auditory canal (arrow).

The small image (lower right) shows the normal facial and auditory nerve in the left internal auditory canal.

Case report

A 23-year-old female presented to our hospital for examination and treatment of incomplete right-sided facial nerve palsy and facial spasms. At the age of 2, she fell off a table and hit her head. After the accident, she developed complete right-sided facial nerve palsy, and conservative treatment with steroids was performed. Facial nerve paralysis gradually improved during the following 21 years, but the right facial nerve was still incompletely paralyzed, and she had facial spasms. Evoked electroneurography (ENoG) showed a slight reaction of about 20%. The eyelid closure rate was 29.7% on the right

side and 68.9% on the left. The upper eyelid movement distance was 3.0 mm on the right side and 7.5 mm on the left. The lower eyelid movement distance was 1.5 mm on the right side and 2.5 mm on the left. The Yanagihara facial nerve grading system score [7] was 18 of 40 points.

Traumatic paralysis was strongly suspected from the medical history. However, it was atypical that pathological synkinesis was unclear. Therefore, MRI was performed to rule out other causes. The fast imaging employing steady-state acquisition (FIESTA) sequence showed avulsion of the right facial nerve at the cerebellopontine angle (Figs. 1 and 2) and mild thickening of the proximal part of the facial nerves on the right side. There was no sign of temporal bone fractures, such

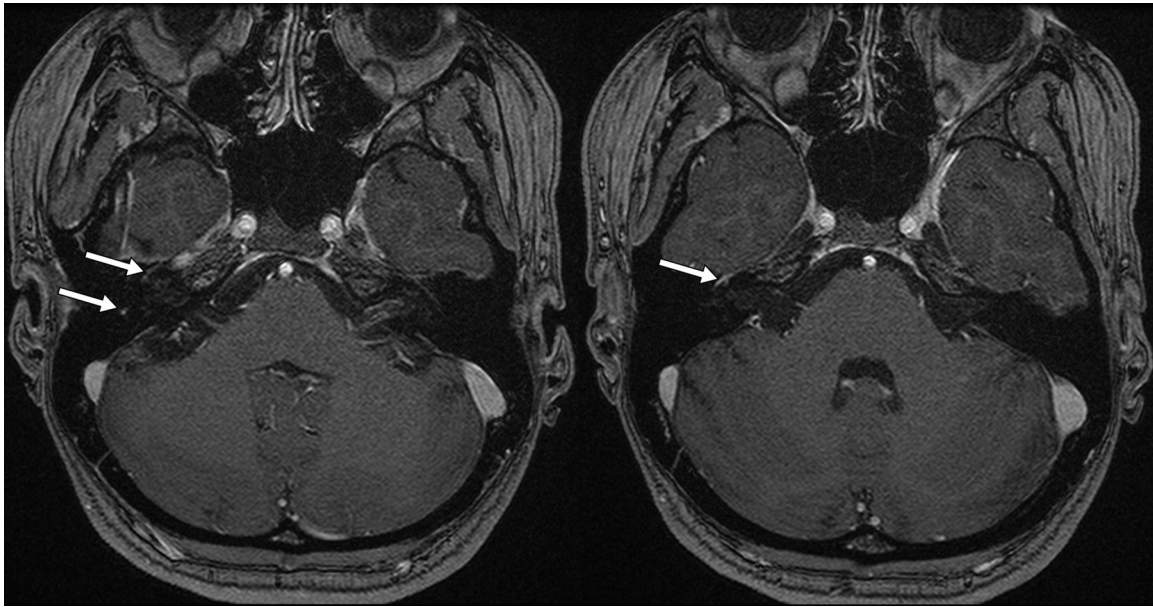


Fig. 3 – Post-contrast transverse T1-weighted images show the normal enhancement of the right facial nerve in the facial nerve canal (arrows).

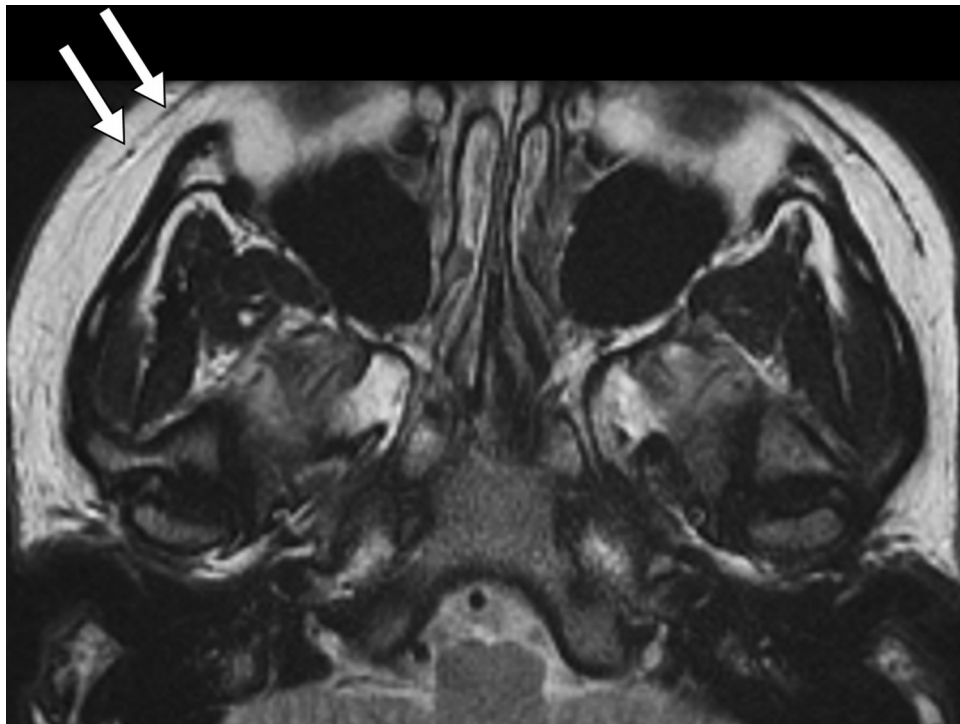


Fig. 4 – T2-weighted image shows atrophy of the right orbicularis oculi muscle (arrows).

as displacement or deformation, on the MRI. The contrast-enhanced T1-weighted images showed normal enhancement of the right facial nerve in the facial nerve canal like the unaffected side (Fig. 3). The T2-weighted images showed atrophy of the right facial muscles (Fig. 4). No other abnormalities were found within or outside the skull.

Discussion

The management of traumatic facial nerve injuries, particularly regarding the indications for and timing of surgical treatment, remains controversial. Because the vast majority of

traumatic facial palsies resolve spontaneously, surgical treatment indication should be based on prognostic factors for poor outcomes [8]. Traditionally, surgical decompression is indicated for cases of a) immediate onset, b) complete facial paralysis associated with temporal bone fractures, and c) unfavorable electrophysiological features (ie, response to ENoG < 5%) [9]. However, one study showed that even in such a group of patients, spontaneous recovery with conservative treatment alone was noted in all patients [9]. A meta-analysis of 8 studies that treated patients with complete facial paralysis also showed that conservative, nonoperative management was associated with a higher percentage of patients with more favorable outcomes than surgical treatment [10].

However, there are a few cases in which intracranial facial nerve injury without temporal bone fractures was found on MRI [3,4,6]. In one case, surgical repair performed 9 months after the injury led to some recovery of the facial nerve functions [3]. Usually, 6-12 months of conservative treatment is indicated for traumatic facial nerve injury without temporal bone fractures [11]. In cases with poor recovery with conservative treatment, MRI examinations targeting the facial nerves might provide additional information. Although immediate nerve repair results in the best outcome, if the nerve injury is found on MRI within 2 years, surgical repair could be performed to improve patient prognosis [12].

Patient consent

A written consent was obtained from the patient for publication of this report.

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