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Case Report

Case report of recurrent hemifacial spasm attributed to over-impaction with Teflon sponge

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ABSTRACT

Background: Hemifacial spasm (HS) is a muscular disorder frequently exacerbated by arterial compression amenable to surgical intervention through microvascular decompression (MVD). Recurrence is a known cause and warrants investigation.

Case Description: A 65-year-old woman presented with the left HS of 7 years duration. Her symptoms were initially well controlled with botulinum toxin injections. However, these injections eventually lost their effectiveness, necessitating MVD. At surgery, the anterior inferior cerebellar artery was indenting the facial nerve at its root entry zone. This was carefully dissected away, and several Teflon (polytetrafluoroethylene) felt pledgets were used for decompression. Postoperatively, the patient reported great improvement of her symptoms for 3 months. Gradually her spasms returned, intermittently at first, until finally they became persistent 6 months postoperatively. An MRI was obtained showing elevation and posterior displacement of the VII-VIII complex by the pledgets. After failing to improve, the patient opted for reoperation 10 months after initial MVD. At surgery, the Teflon pledgets were displacing the VII-III nerves posteriorly and superiorly. The Teflon pledgets were dissected free, and the nerve dis-impacted. On her postoperative visit 1 year later, she is spasm free, subjectively, and objectively.

Conclusion: This case illustrates the value of re-imaging recurrent HS, and re-exploration with a favorable rkesult.

Keywords: Hemifacial spasm, Microvascular decompression, Teflon

INTRODUCTION

Hemifacial spasm (HS) is a movement disorder afflicting the facial muscles on one side of the face with a prevalence of 10/100,000 population.[4,8,17] These spasms manifest with uncontrollable twitching of the upper and lower face, and other muscles of facial expression. Primary or idiopathic HS is attributed to vascular compression on the root entry zone of the facial nerve by an aberrant artery. Secondary HS is due to irritation or compression on the facial nerve by a tumor, arteriovenous malformation, demyelination, or stroke. For symptomatic and temporary relief of HS, repeated injections of with botulinum toxin every 2–3 months have proven effective.[4,8]

However, the effectiveness of this treatment often wears off sooner and requires higher dosing.

While effective, botulinum toxin injections are associated with facial asymmetry, double vision and ptosis, and secondary depression.[4,15] The repetitive nature of these injections and their cost

lead patients with HS to seek definitive treatment. For this group of patients, microvascular decompression (MVD) of the facial nerve is the treatment of choice.[1,5,4,8]

Unfortunately, as with other treatments, be they surgical or nonsurgical, recurrences do occur.[7] Herein, we describe a case of HS who underwent MVD with an excellent result lasting no more than 3 months. The recurrence of severe symptoms led to an investigative MRI, followed by re-exploration. So far, the clinical result has been excellent.

CASE REPORT

A 65-year-old woman presented with the left facial spasm of 7 years duration. Her symptoms were initially well controlled with botulinum toxin injections. However, the duration of symptomatic relief decreased over time, necessitating more frequent treatments. Her symptoms were aggravated by eating, chewing gum, conversation, as well as anxiety. She indicated that she had a sister as well as a cousin who underwent surgery for HS. A preoperative MRI confirmed the presence of a vascular conflict on the facial nerve [Figure 1]. She then underwent a left retrosigmoid suboccipital craniotomy and microscopic dissection was performed while monitoring the facial nerve using the nerve integrity monitoring system (NIMS, Medtronic, Minneapolis, MN). The cerebellomedullary cistern was entered and the flocculus elevated, exposing choroid plexus, and the facial root exit zone [Figure 2]. The anterior inferior cerebellar artery was identified compressing the root exit zone. This was carefully dissected away and several Teflon (polytetrafluoroethylene) felt pledgets were placed between the offending vessel and the VII nerve exit zone [Figure 2].

Postoperatively, the patient reported significant improvement of her symptoms for the first 3 months. Unfortunately, her symptoms gradually returned, until they became constant 6 months following her initial surgery. An MRI was obtained [Figure 3] that revealed indentation and posterior displacement of the VII-VIII complex due to the pledgets.

Ten months after her initial surgery, after failing to improve with conservative management, the patient opted for reoperation and exploration through the same incision and craniotomy. Intraoperatively, the VII-VIII complex was distorted, and displaced dorsally and medially by the generous Teflon pledgets [Figure 4]. This required the removal of approximately half of the Teflon sponges. Some pledgets were found to be densely adherent to the nerve complex and were left behind. Facial nerve monitoring was carried out throughout the entire procedure.

One year later, she has remained spasm free, subjectively, and objectively. She has no evidence of facial nerve palsy and is very pleased with the results of her reoperation and wished to return to work.

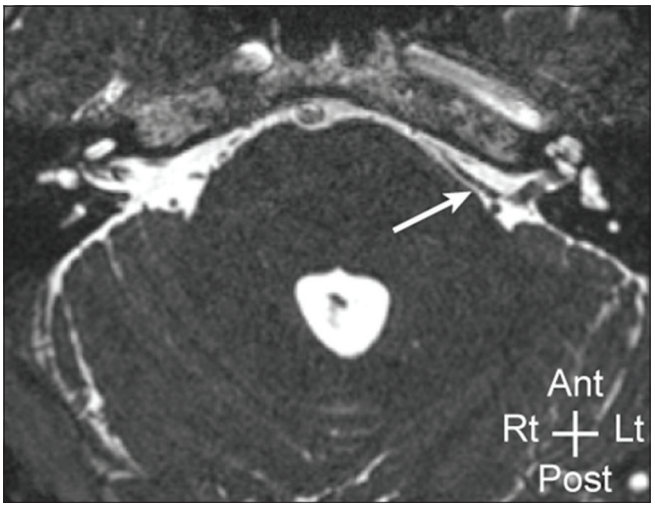

Figure 1: Preoperative T2-weighted MRI shows the left anterior inferior cerebellar artery (arrow) coursing perpendicular to and contacting the VII-VIII complex.

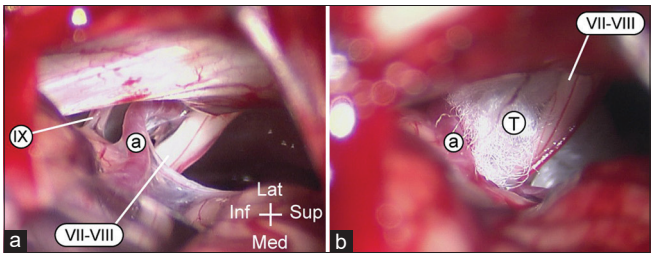

Figure 2: At surgery (a), a vascular loop, most likely anterior inferior cerebellar artery (a with white circle), is seen coursing inferior to the VII-VIII complex (VII-VIII) and displacing it rostrally. Several Teflon pledgets (T) are inserted at the site of conflict, separating the artery from the nerves (b).

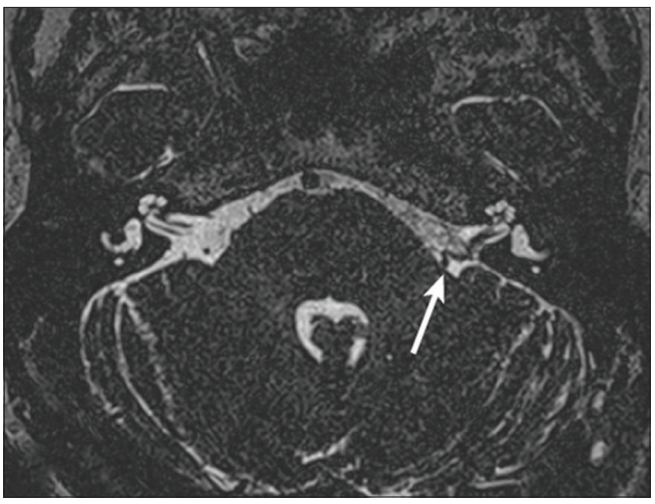

Figure 3: The VII-VIII complex (arrow) is now displaced posteriorly and superiorly by the Teflon pledgets placed beneath the nerve complex.

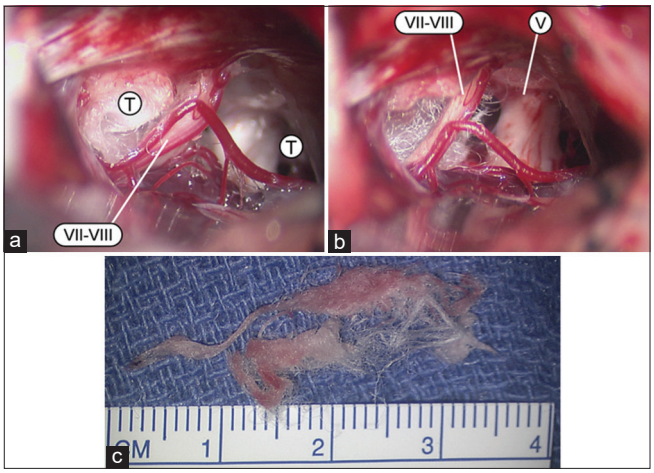

Figure 4: The Teflon (T) sponges are found displacing the VII-VIII complex (VII-VIII) posteriorly (a). The Teflon is dissected free of the nerves and the nerves decompressed with the trigeminal nerve (V) seen superiorly (b). A significant amount of Teflon sponge is removed (c).

DISCUSSION

In 1998, Kureshi and Wilkins reported eight recurrences of HS in their series of 115 MVDs.[8] Cause of recurrence was attributed to newly noted arterial compression in two, scarring in two, venous compression in one, and no new compression in three. In the report of Sindou *et al*.,[14] of the 147 cases of MVD for HS, failure at latest follow-up was estimated at 13%. Park *et al*. reported on 23 recurrent cases of HS out of 2500.[9,12] The period between the index and reoperation ranged from 14 to 188 months with a median of 46 months. Factors contributing to recurrence included (1) misplaced Teflon sponge in 12, (2) incomplete decompression in eight, and (3) strong adhesions in three. At a follow-up of 1 year, 20 patients were improved, with one facial nerve palsy secondary to surgery. Xu *et al*.[16] reported on 42 patients with persistent HS and 36 cases of recurrent HS out of a population of 1200 cases of MVD for HS. The period to recurrence ranged from 0.1 to 5 years, with an average interval of 1.4 years. Reasons for the failed MVD were attributed to new source of compression in six patients, excessive amount of sponge in four, inadequate amount of sponge in 11, misplaced pledgets in eight, absent pledget in six, and arachnoidal adhesions in five. Reoperation was undertaken at an average of 6 years with a range of 1–21 years. Improvement and cure in patients with recurrent HS were reported in 34 patients and failure following re-exploration in two. No details or illustrations are provided regarding the four cases with excessive, or the 11 cases with inadequate amount of sponge.

Of the 845 MVD for HS performed by Bigder *et al*., 12 cases were for persistent or recurrent HS.[2] The cause of persistence was persistent proximal compression at the root exit zone. The authors stated that the "arachnoid over the root exit zone had not been opened" at the index operation. Decompression of the root exit zone was successful in all 12 cases.[2] Interestingly, Chang *et al*. also addressed the site of proximal, distal, or cisternal compression.[3] In their report of 2137 cases of HS, 55 were categorized as poor (<50% improvement) or bad (no improvement), with 51 of the 55 cases occurring from proximal compression. While no explanation was provided by the authors, we surmise that in these failures were some cases of persistence or recurrence of HS. The authors did not address reoperation or causes of failure. However, they did not believe that cases of distal or cisternal compression (14 cases) did any worse than those with proximal (2022 cases), or mixed compression (101). Thought the difference in outcome between the three groups was not significant, the number in the cisternal group was too small for statistical comparison. In their report of 56 cases of recurrent HS, Shin *et al*.[13] demonstrated eventual resolution without having to resort to re-exploration in 54. Of the remaining two patients, one reported improvement, and the second failed to improve. Their recommendation was to persevere with conservative management as most relapses will disappear within 9 months. Our case demonstrated recurrence of HS, necessitating reoperation 10 months after the index operation. Preoperative MRI of our patient [Figure 3] suggested that the nerves were displaced and distorted by the Teflon, which indeed was confirmed at surgery [Figure 4].

Symptomatic Teflon granulomas have been reported following placement for the treatment of HS.[6,10] In one case,[6] this granuloma was a 2.1-cm enhancing mass developing 3 years following implantation. The patient presented with hearing loss, facial numbness, diplopia, and a positive Romberg test. In this case, the mass was removed, revealing granulomatous inflammation. In a second patient,[6] the patient presented with sensorineural hearing neural loss and facial spasms 11 years after MVD for HS. Imaging revealed a 1.4 cm mass at the cerebellopontine angle. It was felt that removal of the mass would not alleviate the patient's symptoms, and thus it was ignored. In a report by Magerian *et al*.,[10] the patient presented 3 years after MVD for HS. Presenting symptoms were primarily sensorineural hearing loss and imaging revealed a 1-cm enhancing mass at the internal auditory canal. Following removal, the mass consisted of "Teflon-induced granuloma" on histopathological examination. A fourth patient with symptomatic Teflon-induced granuloma was reported by Oda *et al*.[11] Here again, facial palsy and hearing loss occurred 7 years after MVD for HS. Imaging revealed a 1-cm enhancing mass with significant edema. Pathology revealed a foreign body granuloma with mononuclear infiltrate without infection. The authors[6,11] recommend minimizing the amount of Teflon and attempting to distance it from the dura.

Our case was not associated with a granuloma. Our patient initially responded to the surgery, but declined 3 months

later. It recalls the report bu Xu *et al*.[16] in which 42 cases of recurrent HS were explored, with surgery revealing misplaced pledgets in 15, insufficient pledgets in five, and excessive pledgets in two. Our case emphasizes that MVD for HS should provide adequate decompression without distorting the cranial nerve complex. The immediate response of the patient to surgery suggests that the mechanical displacement of the nerve led to symptomatic relapse. Though the relapse had lasted for 6 months, it was still reversible.

In summary, the authors advocate investigating relapsed HS with high-resolution MRI imaging. If the relapse persists, timely re-exploration is recommended.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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