

Case report

Resolution of hemifacial spasm after successful treatment of posterior fossa arteriovenous malformation by gamma knife radiosurgery



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1. Introduction

Hemifacial spasm (HFS) is a condition manifested by involuntary unilateral contraction of the facial muscles. Most of symptoms associated with HFS result from compression of facial nerve at the root exit zone. Such compression is usually caused by nearby vessels. Hemifacial spasm may also develop from other pathologies that involve cerebellopontine angle (CPA), such as tumors, arteriovenous malformations (AVMs), or aneurysms that impact the root exit zone of the facial nerve. Microvascular decompression (MVD) is preferred surgical treatment for most patients with HFS [1]. We report a case of HFS caused by an AVM in CPA in which the patient was treated with gamma knife radiosurgery.

2. Case report

A 55-year-old man presented to our clinic with right HFS of 3 years' duration. His initial symptom was involuntary facial contractions in periorbital area. The patient had no history of drug therapy or other treatments to address facial contractions. A neurological examination was unremarkable except for right HFS involving right periocular and perioral regions. Magnetic resonance imaging (MRI) was performed, and T2-weighted images showed lesion in right CPA that was suspected to be an AVM. Cerebral digital subtraction

angiography confirmed this and permitted definitive diagnosis of Spetzler–Martin Grade 3 AVM (Fig. 1).

The patient refused surgery and was treated with Leksell gamma knife radiosurgery (Leksell Gamma Knife, Model B, Gamma Plan 5. 32) instead, with a prescribed dose of 12 Gy to 50% isodose line (Fig. 2). The volume of nidus was 7.23 cm³. By 6 months of follow-up, the HFS had regressed such that it was localized to right periocular area. By 15 months, the spasm had completely resolved. Repeat MRI and digital subtraction angiography at 24 months after gamma-knife radiosurgery showed that the size of the AVM had decreased (Fig. 3).

3. Discussion

The incidence of HFS of any origin is 0.84 per 100,000 for females and 0.74 per 100,000 for males, with corresponding prevalence of 14.5 and 7.4 per 100,000 [2]. The peak age range of HFS occurrence is 50–60 years and magnetic resonance imaging is in the diagnostic tool of choice for ruling out primary pathologies that may cause HFS, such as tumor or other brainstem lesion [2].

The method of choice for treating HFS also depends on the specific cause identified. In cases of gross pathology, such as a CPA mass lesion (e.g., tumor or AVM) which accounts for 0.02% of all HFS [3], the treatment options are surgery or Leksell gamma knife radiosurgery, and embolization for AVMs only [4]. In our case, the cause of HFS was an AVM in the CPA and there is only 6 previous reports of such cases in literature [1,5–8] (Table 1). The management for these patients included complete excision of AVM, observation alone or no intervention.

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Fig. 1. (a) T2-weighted MRI revealed a hypointense, signal void lesion in the right cerebellopontine angle, suggesting a possible arteriovenous malformation. (b) Cerebral digital subtraction angiography identified the lesion as an arteriovenous malformation.

Leksell gamma knife radiosurgery is an effective treatment modality for AVMs; however, ours is the first documented case in which this technique has been used to treat HFS caused by an AVM in the CPA.

The cause of the HFS in our patient was most likely direct vascular compression related to arterIALIZED veins around the facial

nerve. And HFS began to resolve after 6 months. It would be very optimistic if we talk about the total closure of AVM by 6 months since the optimal time for AVM closure after gamma knife radiosurgery is around 2 years [9]. One might think that HFS revealed because of gamma knife effect on facial nerve. In presented case we use 12 Gy radiation to 50% isodose line for AVM. This was the

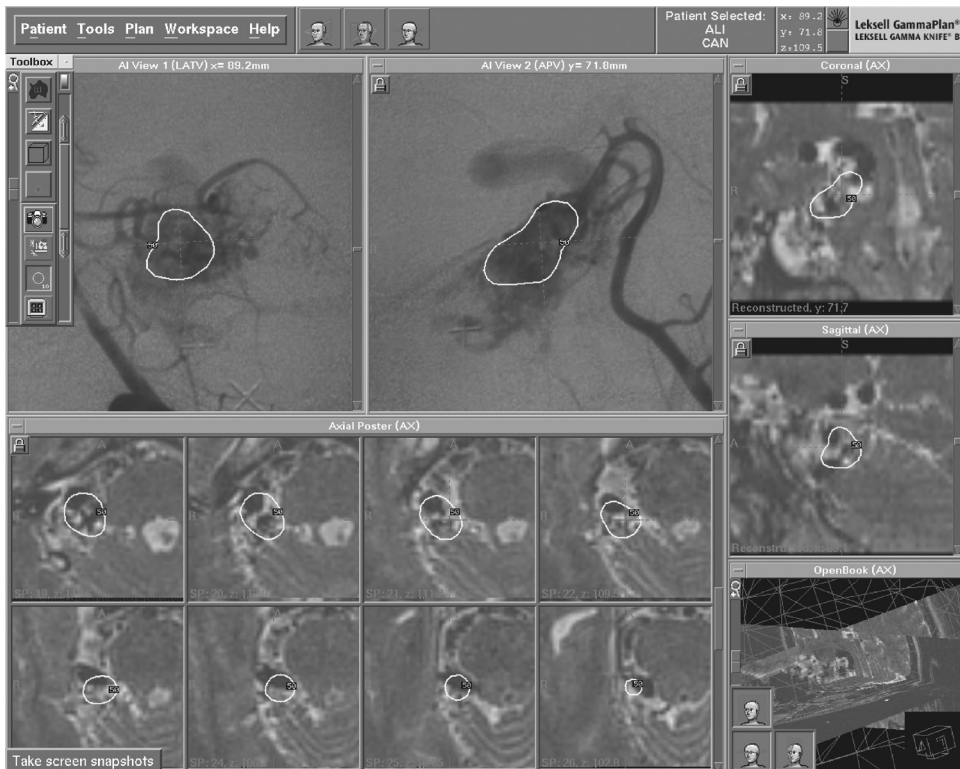


Fig. 2. The arteriovenous malformation was treated with Leksell gamma-knife radiosurgery.

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