Complication Caused by Use of Fibrin Glue in Vessel Transposition for Trigeminal Neuralgia
—Case Report—

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Abstract

A 64-year-old man underwent microvascular decompression of the left superior cerebellar artery (SCA) for left trigeminal neuralgia (TN) using a sling of Teflon tape fixed to the tentorium with fibrin glue. The TN disappeared immediately after surgery, but recurred unusually rapidly at 2 weeks later at the same intensity as before. Second surgery revealed the SCA was suspended from the tentorium, but the trigeminal nerve was stretched and displaced superolaterally because of adhesion to the superior petrosal vein. The adhesion was thought to involve the fibrin glue used during the sling retraction procedure. The nerve was meticulously dissected from the adhesion, and the trigeminal nerve was placed in the correct position. The postoperative course was uneventful, and the TN disappeared completely. We recommend that the smallest amount of the fibrin glue possible be used to avoid adhesion to the surrounding neurovascular elements.

Key words: trigeminal neuralgia, microvascular decompression, sling retraction technique, fibrin glue, early recurrence

Introduction

Trigeminal neuralgia (TN) is generally managed initially by medical treatment, but if the TN remains refractory, open surgery or gamma-knife surgery is considered. Microvascular decompression (MVD) is the standard surgery for TN. However, TN recurs in 3% to 20% of cases, about 56% within the 1st year, and 75% within 2 years. Various risk factors for recurrence after MVD have been identified. Recurrence was more common in women than in men, and was associated with venous compression and long duration of symptoms prior to the initial surgery. The main cause of recurrence is adhesion between the implant and the adjacent neurovascular structures. Transposition techniques have recently been used instead of interposition techniques to avoid such adhesion. The sling retraction technique is particularly recommended.

We report a rare complication caused by the fibrin glue used for sling retraction in the treatment of TN.

Case Report

A 64-year-old man had suffered left TN at the V2–3 divisions for 10 years. Carbamazepine administration had been effective for a few years, but subsequently failed to control the pain. The TN increased in frequency and degree, and he was referred to us for surgical treatment. His medical history included diabetes mellitus, hypertension, hyperlipidemia, and ischemic heart disease.

Neurological examination revealed severe pain in the V2 and V3 divisions with a trigger point at the left maxilla. Magnetic resonance imaging showed the transverse pontine vein crossing over the trigeminal nerve, but the superior cerebellar artery (SCA) was not identified at the exit zone of the trigeminal nerve (Fig. 1).

MVD was performed using a lateral suboccipital approach. During surgery, the left SCA was observed to compress the root entry zone of the trigeminal nerve, and the superior petrosal vein was attached to the trigeminal nerve (Fig. 2A). The transverse pontine vein was also adherent to the anteromedial surface of the trigeminal nerve. The trigeminal nerve and entry zone were dissected...
Recurrence is more frequent in TN involving the arterial loop treated by the interposition technique with Teflon implants because of adhesion between the artery and the entry zone. Teflon granuloma may also be the cause of recurrence. However, recurrent TN may also be due to compression by the vein.

Our patient suffered unusually rapid recurrence of the symptoms at less than 2 weeks after sling retraction surgery. During repeat surgery, we identified adhesion between the trigeminal nerve and the superior petrosal vein involving the fibrin glue used to fix the Teflon sling to the tentorium. We considered this adhesion to be responsible for the recurrence.

Fibrin glue, consisting of human fibrinogen, is widely used for dura mater closure. Viral and prion disease transmission is always a concern with the use of blood-derived products. We used Bolheal (KAKETSUKEN, Kumamoto). The Planova virus removal filter (Asahi Kasei Medical Co., Ltd., Tokyo), with a pore size of 15 nm, is used to exclude viruses from this product. Theoretically, this filtration method can remove all viruses currently known, because Parvovirus, the smallest virus identified, is approximately 20 nm in diameter. The Planova filter also is reported to remove prions. However, the risk of transmission of disease is still difficult to eliminate completely, so we obtained informed consent regarding this point.

Fibrin glue was surrounded by intense inflammation 2 weeks after surgery which had disappeared within 2 months, but granulation tissue remained at the site of glue application. In our patient, the
fibrin glue appeared to be associated with inflammation.

This rare complication of fibrin glue use during the sling retraction procedure for treatment of TN indicates that minimal amounts of fibrin glue should be used, and care should be taken not to spill glue material to prevent adhesion to the surrounding tissues. After the procedure, the area around the cistern should be carefully examined and washed out before closure of the dura. Repeat surgery should be considered in patients with early recurrence of symptoms.

References


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