Occlusion of an Incidentally-Found Dissecting Aneurysm of the Vertebral Artery at Removal of a Jugular Tubercle Meningioma

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Abstract

This report presents a rare case of a 52-year-old female who had a left jugular tubercle meningioma with intratumoral hemorrhage and an adjacent dissecting aneurysm of Vertebral Artery (VA). The findings of neuroradiological images, such as fusiform dilatation and retention of contrast medium on angiogram and intratumoral hematoma on magnetic resonance imaging made a diagnosis of dissecting aneurysm. Because we speculated that the tumor was symptomatic and the dissecting aneurysm was not, only the removal of tumor was performed via lateral suboccipital craniectomy to result in total removal. Besides, intraoperatively, the intratumoral hematoma of dissecting aneurysm looked old and unruptured, we left it untreated. However, postoperative angiography revealed the occlusion of VA including the dissecting aneurysm. It was assumed the manipulation during the tumor removal altered the hemodynamics and promoted the thrombogenesis of VA with dissecting aneurysm.

Keywords: Dissecting aneurysm; Vertebral artery; Meningioma; Occlusion

Introduction

Commonly, once the dissection of vertebral artery (VA) occurs, subarachnoid hemorrhage or ischemic change happens with severe headache or neurological deficits [1-3]. However, there are some cases of dissecting aneurysm with headache alone or no symptoms [1,2,4]. Although conservative therapy is recommended, natural history of such dissecting aneurysms remains unclear. Therefore, periodic follow-up of neuroimaging is necessary to detect the changes leading to extension of dissection earlier [5,6].

Our case presented a very rare co-localization of a dissecting aneurysm of VA and an adjacent jugular tubercle meningioma. The latter one became symptomatic due to intratumoral hemorrhage. An occlusion of both dissecting aneurysm and VA occurred after tumor removal. It was suggested that the hemodynamic change by intraoperative manipulation for the tumor and surrounding edematous brain causes the occlusion of dissecting aneurysm [3-6].

Case Report

This 52-year-old hypertensive woman was referred to our hospital because of severe headache. Neurological examination revealed nystagmus and ataxia on the left side. Magnetic resonance imaging (MRI) showed a round mass attached to the jugular tubercle; it was iso-intense and marked contrast enhanced with gadolinium; on T1-weighted images the mass included an area of hypo-intensity. These findings led us to suspect jugular tubercle meningioma with internal hemorrhage. The surgical specimen was a meningotheliomatous meningioma with internal hemorrhage. The next day, the patient fell into a stupor and computed tomography scans revealed extension of dissection in VA.

A left vertebral angiogram revealed fusiform dilation in the arterial phase (Figure 2A & Figure 2B) and contrast retention in the venous phase of VA at the distal portion of its junction with the posterior inferior cerebellar artery (Figure 2C). These findings led to a diagnosis of dissecting aneurysm. Although the character of her headache was severe intensity, the pain did start gradually, not suddenly, and was not of sharp quality as the typical pain of dissection. That was why, although its clinical onset of this VA dissection had remained unknown, we posit that the etiology of her headache was different from the dissection, which we decided to treat conservatively.

Total tumor removal was via the suboccipital retrosigmoid approach. Intraoperatively, the intratumoral hematoma of the dissecting aneurysm appeared to be old and unruptured, and we left it untreated. Cerebellar swelling was observed. The surgical specimen was a meningotheliomatous meningioma with internal hemorrhage. The next day, the patient fell into a stupor and computed tomography scans revealed extension of dissection in VA.

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revealed the disappearance of the left quadrigeminal cistern, indicative of upward herniation of the vermis (Figure 3). We immediately performed extensive decompressive suboccipital craniectomy and she regained consciousness. Follow-up angiography one month later disclosed occlusion of the left VA and the dissecting aneurysm (Figure 4). Her neurological status improved gradually and one month later she was transferred to a rehabilitation center.

**Discussion**

The diagnosis of dissecting aneurysm is usually based on angiographic findings. Hyper-intensity along a flow void sign on T1-weighted MRI suggests intramural hematoma and is helpful in reaching an accurate diagnosis [5-7].

We made our diagnosis because the angiogram showed a fusiform dilatation and contrast retention. Although we incidentally found a dissecting aneurysm on preoperative angiographs and MRI scans, we posit its asymptomatic pre-existence, because there were no previous episodes severe headache, and no evidence of subarachnoid haemorrhage (SAH) or infarction on MRI. As a small percentage of patients with dissection is reported asymptomatic in the absence of evidence of SAH or infarction, the recommended treatment is conservative therapy [4,5].

Our patient manifested upward herniation after the operation. We posit that this may be attributable to cerebellar swelling associated with intratumoral hemorrhage and retraction of the peritumoral edematous brain. We also hypothesize that intraoperative manipulation resulted in the occlusion of the dissecting aneurysm and led to subsequent upward herniation.

Haemodynamic changes in the VA and dissecting aneurysm may lead to thrombogenesis and subsequent occlusion [4,8]. Therefore, if a dissecting, asymptomatic aneurysm is found incidentally, great care must be taken not to exacerbate brain edema.

**References**


![Figure 2: Left vertebral angiogram demonstrated the fusiform dilatation of VA in the arterial phase (A; anterior-posterior view, B; lateral view) and the retention of contrast medium in the venous phase (C).](image1)

![Figure 3: Computed tomography scan disclosed the disappearance of quadrigeminal cistern and compression of midbrain by vermis, indicating the upward herniation of cerebellar vermis.](image2)

![Figure 4: Left vertebral angiogram demonstrated the occlusion of VA and its dissecting aneurysm (A; anterior-posterior view, B; lateral view).](image3)