CASE REPORT

Conservative management of a post-traumatic pseudoaneurysm of the artery of cervical enlargement–anterior spinal artery junction

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SUMMARY

A 22-year-old man suffered severe sudden onset head and neck pain after being pushed from behind during an assault. Physical examination was normal. Cervical MRI demonstrated an intradural hematoma, anterior to the cord, between C2–4. Subsequent contrast enhanced MR angiography and digital subtraction vertebral angiography confirmed that the cause of the hemorrhage was a fusiform (presumed dissecting) pseudoaneurysm of the artery of the cervical enlargement at its junction with the anterior spinal artery. The aneurysm was managed conservatively. Follow-up angiography demonstrated that the aneurysm had spontaneously thrombosed within 10 days and remained occluded at 2 months. The patient remained occluded at 6 months following the initial injury. Anterior spinal aneurysms represent a management dilemma and options are discussed.

BACKGROUND

Dissecting aneurysms arise from intramural hemorrhage located between the media and adventitial layers of the arterial wall resulting in wall weakening and aneurysmal dilatation which may progress to rupture into the subarachnoid space, either occurring spontaneously or following trauma. We report a dissecting aneurysm of the artery of the cervical enlargement at its junction with the anterior spinal artery following mild blunt trauma to the

cervical spine. This lesion is rare and represents a conundrum with regards to choice of management as there is very little information on the natural history of spinal artery aneurysms. While at this anatomical location either surgical or endovascular treatment options are challenging and not without significant potential morbidity, the risk of fatal or severe rehemorrhage is ever present but difficult to quantify.

CASE PRESENTATION

A 22-year-old man, previously well, presented with severe sudden onset headache with neck pain after being physically assaulted. The patient reported that he was forcefully pushed from behind. Examination was normal.

INVESTIGATIONS

Cranial CT demonstrated subarachnoid hemorrhage at the foramen magnum extending superiorly to the prepontine cistern. Cranial CT angiography was normal. Cervical MRI confirmed an intradural hematoma anterior and to the left of the cord, maximal at C4 (figure 1). Contrast enhanced MR angiography revealed an area of aneurysmal dilatation adjacent to the hematoma (figure 2). Left vertebral angiography confirmed a 3 mm fusiform (presumed dissecting) aneurysm of the artery of the cervical enlargement at its junction with the anterior spinal artery (figure 3).

Figure 1 Sagittal (A) T2 and (B) T1 weighted, and (C) axial T2 weighted MRIs of the cervical spine demonstrate an intradural hematoma anterior and to the left of the spinal cord, between C2 and C5, with its largest portion at C4.

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Figure 2 Contrast enhanced MR angiography of the cervical spine, (A) frontal and (B) lateral projections, demonstrate a small aneurysm anterior to the spinal cord and to the left of the midline at C4 (arrows).

TREATMENT

Both endovascular and surgical management were considered but the potential for morbidity relating to ischemic complications of treatment were considered too great in this case. The morphology of the aneurysm did not lend itself to coil embolization without vessel sacrifice as it lacked a defined neck. The patient was managed conservatively and remained neurologically intact. Repeat digital subtraction angiography 10 days post-injury showed the aneurysm was no longer filling (figure 4) and had therefore likely thrombosed.

OUTCOME AND FOLLOW-UP

At the 6 month follow-up the patient remained neurologically intact with normal cervical MRI and MR angiography.

DISCUSSION

Isolated ruptured spinal arterial aneurysms are rare.¹ They most commonly occur in association with high flow states, such as arteriovenous malformations, dural arteriovenous fistula, or aortic coarctation, or may occur in association with underlying vasculopathies.^{2 3} Spontaneous lesions are not uncommonly reported but we were unable to identify any similar cases of post-traumatic cervical spinal subarachnoid hemorrhage associated with a spinal artery pseudoaneurysm in the literature. Fusiform dissecting aneurysms, arising from the principle thoracic radiculomedullary supply (T6–T12 levels), have previously been described by Iihoshi *et al*⁴ who also reviewed five similar published cases. Three of these cases were managed conservatively and each had a favorable outcome. This ‘wait and see’ policy has been advocated by Berlis *et al*³ and Gutierrez Romero *et al*⁵ who described five ruptured spinal artery aneurysms arising from thoracolumbar radiculomedullary arteries. One case was presumed to be mycotic and settled with antimicrobial therapy but the other four were spontaneous and resolved without intervention.

Surgery allows treatment of the hematoma and also parent vessel clip occlusion and aneurysm wrapping or microvascular reconstruction so as to preserve parent vessel patency¹ but the endovascular approach has also been reported in the treatment of posterior² and lateral⁶ spinal artery aneurysms following rupture. Tanweer *et al*² used microcoils and glue to occlude the posterior spinal artery in a patient with poor presenting neurological status. Indications for surgical or endovascular management remain unclear.

In the case presented here, despite a traumatic etiology which may be considered more unstable, a wait and see approach was used due to the perceived risk of cervical cord ischemia, especially as the patient was neurologically intact. Repeat imaging at 10 days and 6 months after presentation showed that the aneurysm was no longer filling, indicating thrombosis and remodeling of the lesion.

Figure 3 Frontal (A), lateral (B) and oblique (C) projections of a left vertebral angiogram demonstrate a fusiform aneurysm, anterior to the cord and to the left of the midline at C4, presumed dissecting, and arising from the artery of the cervical enlargement.

Figure 4 (A) Frontal and (B) lateral projections of a left vertebral angiogram demonstrating complete thrombosis of the aneurysm.

Learning points

- ▶ Ruptured post-traumatic spinal artery pseudoaneurysms are a rare phenomenon.
- ▶ There is a growing body of literature supporting the use of a 'wait and see' approach for spontaneous lesions.
- ▶ Surgery and endovascular approaches have been described but the indication for treatment remains obscure.
- ▶ A 'wait and see' policy was successfully employed in this post-traumatic case.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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