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Isolated Spinal Artery Aneurysms: Management Strategies

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Introduction

Aneurysms of the spinal arteries are rare entities, the majority of which are associated with vascular lesions, such as spinal vascular malformations, coarctation of the aorta, MoyaMoya disease, or vertebral artery occlusion. The incidence of spinal artery aneurysms is largely unknown. The literature on spinal artery aneurysms (SAAs) is limited to case reports, a few small series (1), and one systematic review (2). Case reports describe aneurysms of the anterior spinal artery, posterior spinal artery, radicular arteries, and the artery of Adamkiewicz. These aneurysms are usually associated with precipitating factors, including vascular lesions, trauma, infection, or vasculitides. Aneurysms not associated with such conditions are identified as isolated. Management strategies are not well defined, particularly in isolated SAAs. In the literature, treatment methods of both isolated spinal artery aneurysms and otherwise include conservative management (3,4,5), glue or coil embolization (6,7,8), muslin wrapping (1), and surgical resection or clipping (1,9,10).

Methods

Cases of isolated SAAs treated at our center within the last 5 years were identified, and the clinical presentation, management, and outcome were reviewed. A literature review was performed using the search terms: "spinal aneurysm," "spinal artery aneurysm," "radicular artery aneurysm." University of Illinois at Chicago Approved IRB Protocol #2016-1165.

Results

Three cases of isolated SAAs were identified at our institution, including one case with multiple simultaneous SAAs. Clinical presentation included back pain and neurological deficit in all cases, in the setting of hemorrhage. Literature review revealed treatment strategies including conservative management, glue or coil embolization, muslin wrapping, and surgical resection or clipping.

Case 1:

A 23-year-old male with severe back pain, paraplegia, and a ruptured, left T7 dissecting radicular SAA was treated with initial glue embolization and subsequent evacuation of significant subdural hematoma with eventual recovery to ambulatory status. Figure 1.

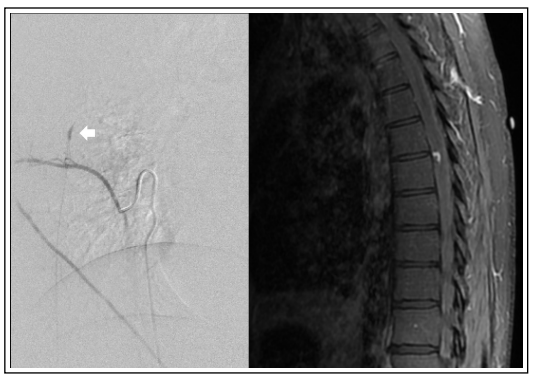

Figure 1. DSA with dissecting pseudoaneurysm of left T7 radiculomedullary artery. MRI sagittal T1 post-contrast with contrast-enhancing extramedullary, intradural nodule at T6-T7.

Case 2:

A 72-year-old female presented with severe neck and back pain and was found to have a ruptured, dissecting T12 radicular SAA. She underwent surgical trapping and hematoma evacuation, with significant gradual recovery of neurological function. Figure 2.

Figure 2. DSA with aneurysmal segment of a small feeder vessel to the posterior medullary artery. MRI sagittal T2 sequence with extensive blood products.

Case 3:

A 60-year-old female presented with bilateral lower extremity weakness and was found to have multiple dissecting and ruptured SAAs at T3, T6 and T10 radicular arteries. She was managed conservatively, and repeat angiogram demonstrated complete spontaneous regression of all three SAAs. Figure 3.

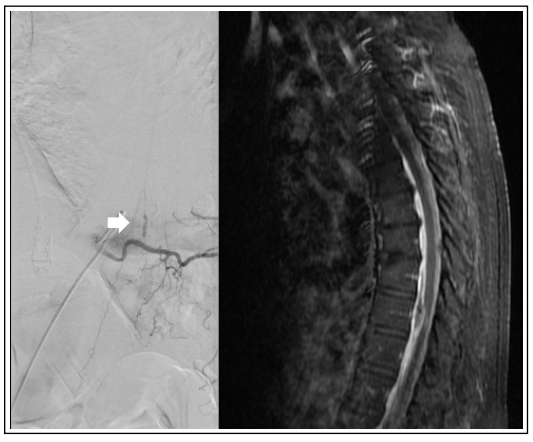

Figure 3. DSA with dissecting aneurysm measuring 2 cm of recurrent radicular medullary branch, artery of Adamkiewicz originating from left T10 and supplying anterior spinal artery. MRI sagittal T1 post-contrast image with heterogeneous, nonenhancing intradural extramedullary mass, spanning from T9 to T11.

Conclusions

Multiple management strategies exist for SAAs, and clinical consideration of patient presentation and lesion morphology determine appropriate strategy. Our case series demonstrates three of these treatment paradigms, all with good or fair neurological outcome.

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