



A Case of Posterior Spinal Artery Pseudoaneurysm Resolution with Conservative Management

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Abstract

This case report discusses a 74-year-old female with a history of chronic well controlled hypertension on lisinopril who was admitted for acute colitis and subsequently developed acute spinal subdural hematoma. The patient presented with severe midline back pain, lower extremity weakness, and sensory disturbances, all sudden onset within 2 h prior to arrival to the hospital, which were unusual compared to her previous back pain experiences. An MRI revealed diffuse spinal canal hemorrhage causing cauda equina compression, and a spinal angiogram identified Posterior Spinal Artery (PSA) pseudoaneurysms. Remarkably, a follow-up angiogram five days later showed spontaneous resolution of these pseudoaneurysms, indicating self-occlusion or tissue remodeling. This case underscores the significance of considering non-traumatic causes in acute neurological deficits and the role of advanced imaging in diagnosis and management. The prevalence of pseudoaneurysm development is 0.5% to 6%. Conservative management, including close monitoring, blood pressure control, and neurological assessment in the hospital, without invasive measures or surgery was effective in this case. The spontaneous resolution observed suggests potential self-healing mechanisms, warranting further investigation into the pathophysiology and optimal treatment strategies for spinal subdural hematomas associated with PSA pseudoaneurysms.

Introduction

This case report describes a 74-year-old female with a past medical history significant for Hypertension (HTN) and depression, initially admitted for acute colitis. She subsequently developed acute symptoms of spinal subdural hematoma necessitating transfer to the Neurocritical Care Unit (NCCU). This report outlines her presentation, imaging findings, and subsequent management.

Ruptured spinal artery aneurysms are extremely rare, constituting less than 1% of all Subarachnoid Hemorrhage (SAH) cases [1]. Consequently, the natural history and optimal management strategies for these aneurysms are not well understood. Unlike ruptured intracranial aneurysms, the presenting symptoms of spinal cord aneurysms are often relatively benign, with patients most frequently experiencing sudden onset back pain and lower extremity weakness [2]. Although the morbidity and mortality associated with ruptured spinal artery aneurysms appear to be low, the limited number of reported cases makes it challenging to draw definitive conclusions. There have been instances where patients have died from re-rupture of a spinal artery aneurysm [3].

The management of spinal aneurysms remains contentious, with three primary approaches: Surgical clipping, endovascular treatment, and conservative management. Most case reports advocate for urgent surgical clipping [4]. In a comprehensive analysis of aneurysmal subarachnoid hemorrhage specifically related to posterior spinal aneurysms, Ikeda et al. [5] reviewed 19 cases and observed a clear preference for open surgical management. The primary goal of surgical intervention is to reduce the risk of rebleeding [6]. However, some authors have advocated for a conservative approach, citing observations of spontaneous regression and a low risk of rebleeding [7,8].

Case Presentation

The patient initially presented with nausea, vomiting, diarrhea, and excruciating midline back pain that were acute starting within 1 h to 2 h prior to admission to the hospital. Notably, this pain was unlike her previous experiences with back pain and several days later was associated with weakness and diffuse numbness/tingling in both Lower Extremities (LEs). Despite a history of L4-5 nerve root ablation a few months prior for chronic back pain, she denied recent trauma or incontinence. Physical examination revealed intact cranial nerves, motor strength deficits in the Lower Extremities (RLE 4-/5, LLE 4-/5), and decreased sensation to pinprick in the left lower

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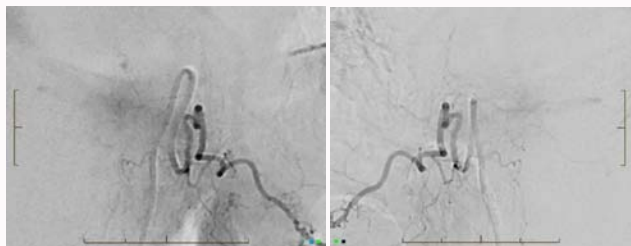


Figure 1: This shows the PSA pseudoaneurysm Pre (left) and Post (right) conservative management.

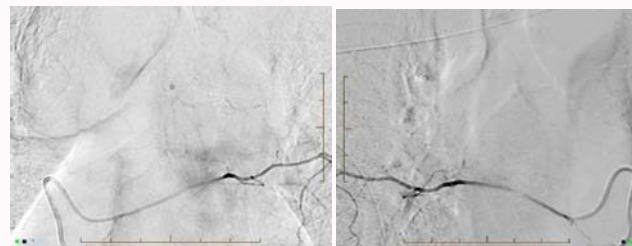


Figure 2: This shows the PSA pseudoaneurysm Pre (left) and Post (right) conservative management.

extremity.

MRI of the lumbar spine taken on admission demonstrated diffuse hemorrhage within the spinal canal consistent with a subdural hematoma, resulting in cauda equina compression and edema in the distal thoracic spine. A spinal angiogram obtained four days after presentation revealed the presence of Posterior Spinal Artery (PSA) pseudoaneurysms contributing to the subdural hematoma. Notably, a repeat angiogram taken five days later demonstrated spontaneous resolution of these lesions, suggestive of self-occlusion or tissue remodeling.

Discussion

The patient's clinical presentation of severe back pain, weakness, and sensory changes prompted imaging studies that revealed a diffuse spinal subdural hematoma predominantly affecting the lumbar and thoracic spine [1-3]. The identification of PSA pseudoaneurysms on angiography highlights a potential etiology of the hemorrhage [4-6].

Management of this case involved close monitoring, including close monitoring, blood pressure control, and neurological assessment in the hospital, without invasive measures or surgery with subsequent angiograms demonstrating spontaneous resolution of the identified lesions without intervention [7-9]. This case underscores the importance of considering non-traumatic causes of acute neurological deficits and utilizing advanced imaging modalities for prompt diagnosis and management.

The spontaneous resolution of Posterior Spinal Artery (PSA) pseudoaneurysms observed in this case of acute spinal subdural hematoma presents a unique opportunity to explore the potential mechanisms of self-healing in vascular lesions, as illustrated in Figures 1 and 2 showing the PSA pseudoaneurysm pre- and post-conservative management for 5 to 7 days. This patient's presentation, marked by severe back pain lower extremity weakness, and sensory disturbances, underscores the importance of considering non-traumatic etiologies in patients with acute neurological deficits.

Imaging studies, including MRI and spinal angiography, played a crucial role in diagnosing the underlying cause of the patient's symptoms. The initial MRI revealed diffuse hemorrhage within the spinal canal causing compression of the cauda equina, while the angiogram identified PSA pseudoaneurysms as the likely source of bleeding. The spontaneous resolution of these pseudoaneurysms on follow up angiography without any surgical or endovascular intervention is particularly noteworthy.

Several potential mechanisms could explain the spontaneous resolution of PSA pseudoaneurysms. One hypothesis is the occurrence of self-occlusion due to thrombosis within the aneurysm

sac, which may be facilitated by the hemodynamic changes and vascular remodeling processes. Tissue remodeling and reparative processes could also contribute to the stabilization and eventual resolution of these aneurysm. These self-healing mechanisms warrant further investigation to better understand their role in the natural history of vascular lesions to identify potential therapeutic targeting for consideration of potential conservative management.

This case also highlights the effectiveness of conservative management in the form of close monitoring and supportive care. The decision to manage the patient conservatively was based on the stability of her neurological status and absence of progressive symptoms or signs of increased intracranial pressure. The favorable outcome in this patient suggests that, in selected cases, conservative management may be a viable option for patients with PSA pseudoaneurysm associated with spinal subdural hematomas. Both Figure 1, 2 show the PSA pseudoaneurysms Pre (left) and Post (right) conservative management.

The findings from this case have important implications for clinical practice. First, they emphasize the need for a high index of suspicion for vascular causes of spinal hemorrhage in patients with atypical presentations of back pain and neurological deficits. Second, they underscore the value of advanced imaging techniques, such as spinal angiography in identifying the etiology of spinal hemorrhage and guiding management. Third, it suggests that conservative management, with careful monitoring and follow up imaging, may be appropriate in certain cases of PSA pseudoaneurysms, particularly when spontaneous resolution appears likely.

Further research is needed to elucidate the underlying pathophysiology of PSA pseudoaneurysms and their spontaneous resolution. Prospective studies and larger case series are necessary to determine the prevalence of spontaneous resolution and to identify factors that predict favorable outcomes with conservative management. Additionally, exploring the potential role of adjunctive therapies, such as anticoagulation or antiplatelet agents, in promoting aneurysm thrombosis and resolution could provide new insights into the optimal management of these lesions.

Therefore, this case report highlights a rare presentation of spinal subdural hematoma associated with PSA pseudoaneurysms and demonstrates the potential for spontaneous resolution with conservative management. These findings continue to our understanding of the natural history of vascular lesions in the spinal cord and suggest that non-invasive management strategies may be effective in selected patients. Ongoing research and clinical vigilance are essential to further refine our approach to the diagnosis and treatment of spinal vascular lesions.

Conclusion

In conclusion, we detailed a rare presentation of spinal subdural hematoma associated with posterior spinal artery pseudoaneurysms in a patient with acute colitis [10-12]. The spontaneous resolution of identified lesions on repeat angiography suggested potential mechanisms of self-occlusion or tissue remodeling [13-16]. Continued vigilance and further studies are warranted to elucidate the underlying pathophysiology and optimal management strategies for such cases.

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