

CASE REPORT

Spinal Dural Arteriovenous Fistula masquerading as Non-ST-Elevation Myocardial Infarction-Lesson learnt

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ABSTRACT

Background: Spinal dural arteriovenous fistulas are rare vascular anomalies commonly affecting men aged 50-70 years. They involve abnormal connections between dural arteries and veins, causing venous hypertension and spinal cord dysfunction, often presenting with nonspecific symptoms like myelopathy and motor deficits. Treatment options include endovascular embolisation and surgical ligation, aiming to obliterate the fistula while preserving spinal cord function.

Case Description: A 60-year-old male with no significant medical history presented with chest pain. He was initially diagnosed as NSTEMI (Non-ST-Elevation Myocardial Infarction), and he progressively worsened to paraplegia in 8 hours. Imaging revealed a spinal dural arteriovenous fistula (AVF) at the D6 level. The patient underwent successful surgical intervention with partial recovery of motor function and sensation in the lower limbs. He was discharged with follow-up recommendations for physiotherapy and urinary catheter care. Conclusion: This case underscores the importance of considering spinal AVF in patients having chest pain with neurological symptoms.

Key words: SpinalAVM, SpinalAVF, Myocardial Infarction

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INTRODUCTION

Spinal dural arteriovenous fistulas represent a rare but clinically significant vascular abnormality of the spinal cord. These account for approximately 70-80% of spinal arteriovenous malformations and are more prevalent in men aged 50-70 years. The exact aetiology of SDAF remains uncertain, with hypotheses suggesting a combination of congenital and acquired factors contributing to their development. Patients often present with insidious and nonspecific symptoms, including progressive myelopathy, radiculopathy, and sensory or motor deficits. Diagnostic challenges may arise due to symptoms mimicking other spinal cord pathologies. Diagnosis of SDAF requires a high index of suspicion and often involves a combination of imaging modalities. Magnetic resonance imaging (MRI) with contrast enhancement is the primary tool for detecting characteristic findings, while spinal angiography remains the gold standard for confirmation and characterisation of the fistula. Management of SDAF aims to obliterate the

abnormal arteriovenous shunt while preserving normal spinal cord perfusion. Endovascular embolisation and surgical ligation are common treatment options, with endovascular techniques gaining favour due to their minimally invasive nature and high success rates. Timely diagnosis and appropriate treatment are crucial for optimising outcomes in SDAF. Untreated or inadequately managed cases can lead to progressive neurological deterioration and permanent disability. However, with prompt intervention, many patients experience significant improvement or stabilisation of symptoms.

CASE REPORT

A 60-year-old labourer presented to the A&E with lower chest and upper abdominal pain. The patient, who walked to the hospital, was found to have bilateral lower limb weakness on clinical examination. He also reported numbness in both lower limbs. He was initially diagnosed as NSTEMI (Non-ST-Elevation Myocardial Infarction)

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(Fig. 1). His Trop-T was negative, and he further developed over 4 hours, which progressively worsened to paraplegia in 8 hours. He also developed urinary retention. On examination, bilateral knee and ankle reflexes were absent. Sensory level was noted at D9. The right plantar reflex was upwards, while the left was mute.



Fig-1: Electrocardiogram showing non-ST elevation

MRI spine was done, which showed an extramedullary T2 heterogeneously hypointense lesion of the mid-dorsal spinal cord with compression (Fig. 2). A spinal Digital Subtraction Angiogram was also done which showed a dural Arteriovenous Fistula (AVF) on the right D6 injection, just below the right D6 pedicle, supplied by the radicular branch arising from the D6 intercostal artery. The draining radicular vein coursed superiorly with a 3.4 x 2.8 mm venous pouch at D4-D5 level at its confluence with the peri-medullary veins, giving a diagnosis of a D6 dural fistula with a venous varix (Fig. 3).



Fig-2: MRI spine shows an extramedullary T2 heterogeneously hypointense lesion of the mid-dorsal spinal cord with compression.

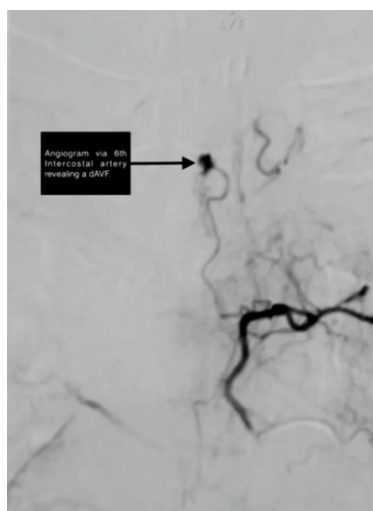


Fig-3: Digital Subtraction Angiography shows a dural Arteriovenous Fistula (AVF) at just below the D6 pedicle, supplied by the radicular branch arising from the D6 intercostal artery.

The patient underwent D6 laminectomy, D5/D7 partial laminectomy, and excision of the dural fistula. Intraoperatively, arterialized medullary veins were observed, and the spinal cord appeared yellowish around the D5 level, suggesting pigmentation by blood products (hematoma). A feeding artery from the 6th intercostal space travelled from the right side of the cord to the varix.

In the postoperative course, the power in the left lower limb improved to 5/5, but it was 4/5 in the right lower limb. Sensations in both lower limbs improved. The patient was advised to undergo physiotherapy and urinary catheter care during follow-up.

DISCUSSION

Spinal arteriovenous fistulas (AVFs) are rare vascular malformations that can present with a variety of symptoms, often leading to delayed diagnosis due to their nonspecific nature. While the classic presentation involves progressive neurological deficits, such as lower limb weakness, sensory disturbances, and bladder or bowel dysfunction, these malformations can sometimes manifest with atypical symptoms that mimic other conditions, including myocardial infarction.⁶ In the literature, there are reported cases where spinal AVFs have presented with symptoms suggestive of myocardial infarction. The underlying mechanism could involve the extensive network of blood vessels and the resulting venous congestion impacting spinal and cardiac function. Such presentations are particularly challenging as they require a high index of suspicion and comprehensive diagnostic workup to differentiate from true cardiac events.

Many cases report that spinal AVFs present with vague symptoms that can lead to significant diagnostic delays. Common symptoms include back pain, lower limb weakness, and sensory changes, which are often misattributed to more common conditions like musculoskeletal disorders or peripheral neuropathies. In one case, a patient presented with symptoms that were initially misinterpreted as a myocardial infarction due to the acute onset of chest pain and dyspnea, which later was found to be related to spinal AVF upon further imaging and angiographic studies.⁷

The diagnostic process involves performing a spinal MRI and spinal angiogram. A spinal MRI typically reveals cord oedema, characterised by central medullary hyperintensity

in the conus medullaris, and an increase in cord volume, which may present as ascending myelopathy. Additionally, it often shows peri-medullary vascular flow with hypointense serpiginous features following the injection of a contrast agent, indicative of venous ectasias. Diagnosis using MRI hinges on identifying high T2 signal intensities or vascular flow voids.

Spinal angiography serves both diagnostic and therapeutic purposes, but can be challenging due to the variability in spinal and epidural vascular anatomy among patients. Moreover, it carries inherent risks. For instance, the presence of a segmental medullary branch in the radiculo-meningeal artery could make embolisation particularly hazardous, posing a significant risk of spinal cord ischemia.⁸

Treatment options include endovascular intervention, endovascular embolisation, or microsurgical occlusion, all aiming to block blood flow through the fistula. Early detection is crucial and significantly improves the prognosis. However, late diagnosis is common in this rare condition, with delays ranging from one to three years in 10-34% of cases. Delayed diagnosis and treatment can lead to severe complications such as spastic or flaccid paralysis and loss of bowel or bladder control.⁹

CONCLUSION

Spinal arteriovenous fistula (AVF) is a rare and potentially debilitating vascular disorder that can significantly affect spinal cord function. Due to its infrequent occurrence and the varied presentations it can manifest, early and accurate diagnosis is paramount. Clinicians must maintain a high level of clinical suspicion, especially since spinal AVFs can present with atypical symptoms like acute chest pain. Given the complexity and variability in presentation, it is crucial to promptly refer patients to a tertiary care centre with specialised resources.

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Written Informed Consent: Taken

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