



Case Report

Spontaneous spinal cerebrospinal fluid venous-fistula treated with transvenous embolization: A case report

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ABSTRACT

Background: Spinal cerebrospinal fluid venous fistula (CVF) is a recognized cause of chronic positional headache and spontaneous intracranial hypotension (SIH). It occurs due to an aberrant connection formed between the spinal subarachnoid space and an adjacent spinal epidural vein. The diagnosis of CVF can be difficult to establish but can be documented utilizing advanced imaging techniques (e.g., enhanced MR myelography/digital subtraction myelography). Their treatment involves surgical ligation of the involved nerve root, imaging-guided epidural blood patching, and/or endovascular embolization. Here, we report a 40-year-old male who presented with a symptomatic lumbar CVF successfully treated with transvenous embolization.

Case Description: A 40-year-old male presented with several months of positional headaches. The MRI of the brain showed diffuse pachymeningeal enhancement consistent with the diagnosis of SIH. Although the MR of the lumbar spine was unremarkable, the MR myelogram with digital subtraction imaging showed a CVF at the L2 level. Following transvenous embolization (i.e., through the Azygous vein), the patient's symptoms fully resolved.

Conclusion: Spinal CVF are rare and may cause chronic headaches and symptoms/signs of SIH. In this case, an MR myelogram with digital subtraction images demonstrated the anomalous connection between the spinal subarachnoid space and an adjacent spinal epidural vein at the L2 level. Although open surgical ablation of this connection may be feasible, less invasive techniques such as endovascular embolization should become the treatment of choice for the future management of CVF.

Keywords: Cerebrospinal fluid, Embolization, Fistula, Venous

INTRODUCTION

Cerebrospinal fluid venous fistula (CVF) is defined as an aberrant connection formed between the spinal subarachnoid space and an adjacent spinal epidural veins allowing for the unregulated loss of cerebrospinal fluid into the circulatory system.^[1] Spinal CVF is a recognized cause of spontaneous intracranial hypotension (SIH), and chronic positional headache.^[9,11] The diagnosis of spinal CVF may be difficult to establish, but MR myelogram with digital subtraction myelography may correctly diagnose these lesions.^[3] Here, we used transvenous endovascular embolization to treat an L2 CVF in a 40-year-old male.^[1,8,9,12]

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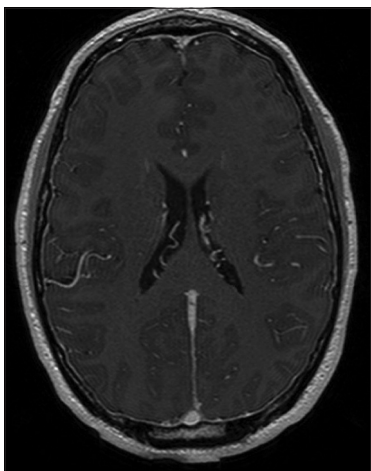


Figure 1: T1-weighted brain MRI (axial view) with contrast showing diffuse pachymeningeal enhancement.



Figure 2: Xpert CT during digital subtraction myelogram showing contrast enhancement along the right L2 nerve root (dashed line) concerning for cerebrospinal fluid venous fistula.

CASE DESCRIPTION

A 40-year-old male presented with spontaneous onset of SIH characterized by positional headaches for several months. His neurological exam was normal. The enhanced MRI of the brain showed diffuse pachymeningeal enhancement consistent with SIH [Figure 1]. The routine MRI of the lumbar spine was unremarkable; he had two blood patches performed, both with only transient relief of symptoms. However, the MR myelogram with digital subtraction images finally correctly documented a right-sided CVF at the L2 level [Figure 2]. The patient successfully underwent endovascular transvenous embolization (i.e., through the Azygous vein), and within two post procedural weeks, was asymptomatic [Figure 3].

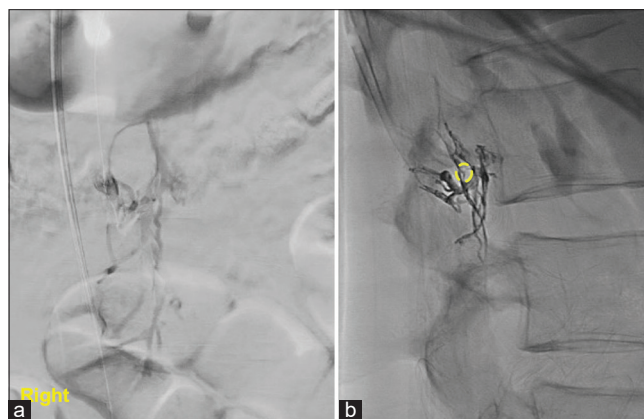


Figure 3: Angiographic images (AP view [a] and lateral view [b]) that show the embolization of the cerebrospinal fluid-venous fistula using ONYX. The dashed circle on the lateral view indicates the location of the nerve root.

DISCUSSION

SIH

SIH patients are typically females in their 5th/6th decades.^[7] Chronic positional headache is the most common presenting symptom. Localizing these lesions requires advanced imaging techniques. MR-myelography is the study of choice with an 88% sensitivity rate. The typical imaging features of CVF include irregular nerve root sleeve that is in direct contact with a paraspinal vein.^[4,5]

Levels of CVF

Most CVF are found in the thoracic spine; only a few cases are found in the cervical and lumbar regions.^[10] Available treatment modalities include open surgical ligation of the involved nerve root, the use of epidural blood patches, or injection of focal fibrin glue.^[6,13] However, more recent transvenous embolization techniques utilizing the lumbar venous plexus or Azygous vein have shown promising results (i.e. 80% complete resolution of symptoms of CVF).^[2]

CONCLUSION

CVF, responsible for SIH, is best diagnosed utilizing MR-myelography/digital subtraction myelograms. Although direct surgical treatment may be successful, endovascular procedures are increasingly and less invasively effectively managing CVF Lesions.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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