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Case Report

Epidural venous plexus enlargement secondary to left iliac vein occlusion: case report

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ABSTRACT

We present a 34-year-old male case, with a history of primary thrombophilia under treatment with rivaroxaban, deep vein thrombosis of the left leg and extremities plus pulmonary thromboembolism 10 years ago. He reported digestive symptoms and chronic low back pain with left leg edema. Phlebography diagnoses occlusion of the left iliac vein with dilated veins of more than 3 cm on the left peri-vertebral side. Angioplasty plus stent placement is performed, the collateral venous network and the patient's symptoms disappear.

Keywords: Epidural, Dilated venous, Lumbar plexus, Iliac vein occlusion, Pelvic venous congestion syndrome

INTRODUCTION

In patients with lumbar pain and/or radiculopathy, spinal epidural venous plexus enlargement is an under-recognized cause of neurologic symptoms that should be considered in the differential diagnosis. Epidural venous plexus dilation is an uncommon cause of these symptoms, and it is rarely reported in the literature.[1] There is limited literature on the association between IVC (inferior vena cava) obstruction and back pain. In patients with IVC obstruction, blood from the lower extremities and pelvis is routed to the azygous vein via paravertebral veins and the vertebral venous plexus (epidural venous plexus enlargement, EVE), which can mimic symptoms of lumbar disc herniation or spinal canal stenosis.[2]

CASE REPORT

We present a 34-year-old male case, weight 70 kg, height 150 cm, history of deep vein thrombosis of both legs plus pulmonary thromboembolism 10 years ago, medical management with anticoagulants and compression stockings, diagnosis of primary thrombophilia secondary to factor V mutation in 2023, treated with rivaroxaban 20 mg one time a day (OD), and apixaban 10 mg OD. The patient reported digestive symptoms, abdominal distention and chronic low back pain. On physical examination, suprapubic venous dilations and testicular region with edema in the left leg with ocher pigmentation changes in the internal malleolus. computed tomography angiography in 2023 from an external hospital reports apparent compression of the left renal vein by the superior mesenteric artery, probable nutcracker syndrome. The symptoms increase in intensity, the patient is taken to the hemodynamics room on January 2024 for diagnostic and therapeutic study. The procedure begins with ultrasound-guided puncture of the right jugular vein, placement of a 6 Fr introducer, guide is lowered with a catheter, diagnostic phlebography of both renal veins is performed, which appears normal without signs of clamping by the mesenteric artery or nutcracker syndrome suggest and no gonadals vein reflux. Normal infrarenal cavography without thrombosis, phlebography of the right femoral at the level of the head of the femur without thrombi or a history of it, when trying to cannulate the left common iliac vein it was not achieved despite multiple attempts, a femoral puncture was decided poor lumen is seen with multiple thrombi, a

popliteal puncture is attempted, multiple collaterals are observed with chronic thrombus, the femoral region is resumed in an arterial puncture, compression and a new attempt is made. The common femoral vein was punctured, the guide difficult to ascend, phlebography was performed through the needle, which showed occlusion with synechiae throughout the iliac vein and total occlusion 5 centimeters before the junction with the vena cava. It presents several branches of left-right collateral circulation, and the largest flow is through the left paravertebral system, which shows a vein more than 3 centimeters dilated (Figure 1). An attempt is made to cross the occlusive lesion of the left iliac vein with several techniques via the jugular route, with an exchange of guides, with a supported catheter until the guide is passed through the femoral route to the IVC.

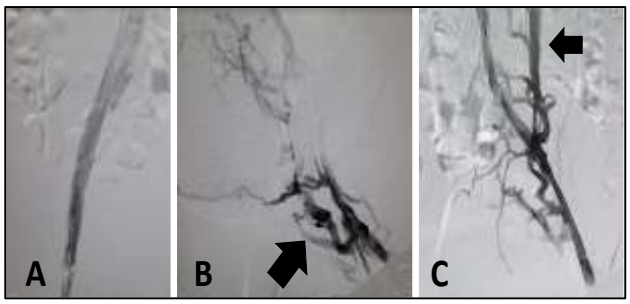

Figure 1 (A-C): Right control phlebography without thrombi, initial left iliofemoral phlebography, total occlusion of iliac venous bridges from left to right and collateral flow through the left vertebral venous system with over dilation 8 mm.

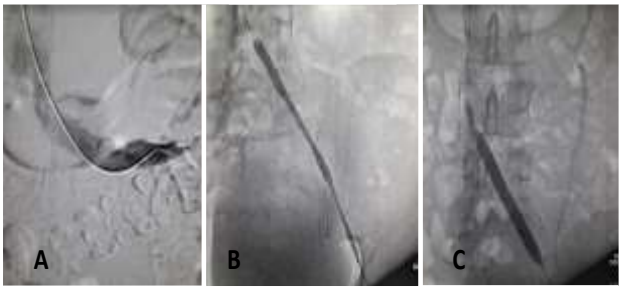

Figure 2 (A and C): Left renal vein phlebography without evidence of gonadal compression or reflux. Left iliac angioplasty with a 7×15 cm balloon and angioplasty with a non-compliant high-pressure balloon of 18×8 cm.

The guide is looped and brought to the jugular region. through and through. We began pre-dilation with a non-compliant 3×20 mm balloon (Gold) in several segments, then a 7×15 cm balloon and finally a 10×8 cm balloon. Contrast passage was evident (Figure 2), presenting recoil of more than 50%, so it was decided to place a 14×8 cm venous stent. Control phlebography shows a stenosis of the external iliac vein in its distal portion, so a second 12×9 cm stent with a 3 cm junction is placed. Last control shot shows a constant flow of contrast medium towards the cava vein, total absence of collateral veins and paravertebral lumbar venous networks (Figure 3).

Upon admission, the patient reported great improvement in his lumbar and digestive symptoms; anticoagulation was started with rivaroxaban and apixaban with a scheme for thrombophilia by hematology.

Figure 3 (A-C): Placement of a 14×8 cm Wall stent in the left iliac vein. Stenosis of the proximal segment of the iliac vein, placement of a second 12× 9 cm stent and control phlebography with system patency left venous, absence of collateral venous flow without vertebral venous networks with immediate improvement of symptoms, absence of lumbar pain.

DISCUSSION

A dilated epidural venous plexus (DEVP) is an unusual finding that can lead to serious consequences, such as intractable radicular pain, cauda equina syndrome, spastic tetraparhesis, and other neurological sequelae. DEVP has been seen secondary to multiple etiologies, including intracranial hypotension, IVC obstruction, portal hypertension, malignancy, Marfan syndrome, May Thurner syndrome, and IVC thrombosis associated with hypercoagulable states such as pregnancy or factor V Lieden. There is little information in the literature, most are clinical cases about iliac vein occlusion and the development of lumbar collateral venous network with symptoms. We present a case of a 35-year-old patient with lumbar and digestive symptoms due to dilation of the epidural venous plexus. who had attended several health institutions. Hallan et al. presents the case of the patient reported chronic back pain for years that progressively worsened over the past month and chronic lower extremity weakness. The patient reports some problems with balance and right leg pain that went from her buttock into the posterior thigh. Magnetic resonance of the lumbar spine showed the right common iliac vein was absent with continuation of the left common iliac vein into the IC. The collateral venous channels were more prominent on the right side in the epidural space and in the posterior spinal soft tissues. Our working diagnosis is DEVP acting as mass lesion with compression of the nerve roots. We found that in 18 of 24 reported cases (75%), DEVP was secondary to some form of IVC obstruction.[3] Originally described by the French anatomist Gilbert Breschet, the vertebral venous

system is a large, valveless, and relatively low-pressure system running parallel to the vena cava, extending through the spinal column, and arranged in a longitudinal pattern as three distinct interconnecting divisions. The lack of valves is free of communication between the internal and external venous networks. The vertebral venous plexus in considered a component of the cerebrospinal venous system, and its bidirectional flow allows regulation of intracranial pressure from postural and venous outflow changes[4]. The vertebral venous system consists of intra and extraspinal vessels that communicate with each other through the radicular veins. At each level, the root veins that connect the system internal or epidural vertebral venous and the external venous cross the intervertebral foramen above and below the pedicle. The vein located below the pedicle is important because it is associated with the exit of the nerve root. Venous return within of the epidural plexus comes from a superior or inferior route depending on the anatomical level.[5] Lett iliac vein compression syndrome or May-thurner syndrome (MTS) is an anatomical condition in which the left common iliac veins (LCIV) is compressed between the right common iliac artery (RCIA) and the fifth lumbar vertebra. In 93.7% is mot associated with an elevated risk of deep vein thrombosis. Neurological symptoms due to extrinsic compression of nerve roots are extremely rare and mostly caused by iliac vein congestion or, this case, collateral venous enlargement.[6] Extensive thrombosis resulting in extreme epidural varices has been described as a very rare etiology of nerve root o cord compression. Most reported cases were associated with mild neurological symptoms, including pain, dermatomal sensory, and motor deficits. If early diagnosis and management are commenced before the progression into spinal cord isquemia, the symptoms can be reverted and resolved.[7] In most of the clinical case reports, the lumbar, digestive, and urinary symptoms did not allow a diagnosis to be integrated. In several cases in the literature, the magnetic resonance study formed the diagnosis. The diagnosis of the patient we present was made in the operative room with phlebography. control, nutcracker syndrome was initially suspected. By performing the hemodynamic control study by left femoral puncture and appreciating the dilated vertebral venous network that ascended throughout the left lumbar spine with multiple bridges in the left-right pelvic cavity, it allowed us to understand the cause of the symptoms. The diagnostic conformation was given when there was an improvement in the symptoms by allowing the continuous passage of blood through its natural route through the iliac vein to the cava and not through collaterals that increased pressure in the lumbar nerve root. Catheter venography, sometimes supplemented by direct pressure measurements, has often been considered the most definitive available imaging test for evaluation of obstructive venous pathology. In addition to depicting the contrast-outlined contours of the vein, venography enables real-time visual estimation of the pace of blood flow and visualization of peri-venous or other pelvic collateral veins that support the hemodynamic significance of a lesion.[8] The presence of an epidural or paraspinous mass continuous within multiples spinal segments, particularly showing signal intensity void on MR images, should raise the suspicion of a vascular anomaly. Cross-sectional imaging methods facilitate the recognition of these anomalies and avoid a misdiagnosis of a true solid lesion, but MR angiographic imaging is invaluable to define the final diagnosis. Overloaded and enlarged venous structures have the potential to compress the nervous system (either the spinal nerves and spinal cord or thecal sac), eventually causing neurologic symptoms, which might be the only and initial symptoms.[9] The authors described a case of MTS with sciatic neuralgia (SN) as the first presenting symptom. Case description: A 53-year-old man gradually developed left SN. During the follow-up period, edema and brownish skin pigmentation were noted on the crural region. Follow-up magnetic resonance imaging of lumbar spine revealed vascular enlargement around the spine and compression of the LCIV by the RCIA. After the narrowed part was expanded with a stent in the LCIV, the pain and edema the left leg disappeared. As described by Yamamoto recently, MTS should be considered as one of the causes of sciatic neuralgia when other compression causes have been discarded, moreover, in this report, the authors also describe their experience with stent placement as an effective and safe treatment.[10] As previously reported in literature, venous stent placement in patients with underlying thrombophilia may be associated with poor patency rate, suggesting the need of further consideration in this subgroup.[11] There are many works on the management of iliac vein occlusion, some in favor of angioplasty and others angioplasty plus stent. The patient had a chronic stenosis with occlusion and multiple synechiae. The residual stenosis after the angiopathy was more than 50%, so it was decided to place a stent. There are many on the market. We only had the Wallstent from Boston scientific, although After performing several control shots and recapturing the stent, a little was released inside the inferior cava. The response to the symptoms is spectacular, the lower back pain disappeared as well as much of the discomfort. It is a pathology with little reference in the literature, despite treating several cases of May Thurner syndrome at the hospital, we have not seen it associated, although there are cases reported in medical journals.

CONCLUSION

Dilation of the lumbar venous plexus due to occlusion of the left iliac vein, although infrequent, is a cause to consider in the etiological diagnosis of lumbar or radicular pain. Endovascular therapy through angioplasty and stent decreases lumbar collateral flow and improves symptoms.

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