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CASE REPORT

Concomitant May-Thurner and Nutcracker Syndrome

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Abstract

Besides iliac compression, venous compression can occur at other sites such as renal region too. We report a case of concurrent iliac and renal vein compression.

Keywords: May-thurner syndrome, Nutcracker syndrome, IVUS, Endovenous stenting

Introduction

Venous compression is a common cause of chronic venous disease. We report a case of concomitant venous compression on the left iliac vein and left renal vein treated by endovascular venoplasty.

Case report

A 45-year-old lady with history of syphilis and bullous pemphigoid had 2-year history of deep vein thrombosis (DVT) of left lower limb treated with Apixaban. She had post thrombotic syndrome (PTS) with persistent left lower limb swelling, heaviness and pain on mobilization. Clinically her Villalta score was 12 indicating moderate PTS severity. She also complained of occasional pelvic pain worse during menstruation, and dyspareunia. CT venogram showed evidence of left common iliac vein (CIV) compression and possible left renal vein compression compatible with concurrent May-Thurner syndrome and Nutcracker syndrome. In view of her persistent symptoms, she was referred for venoplasty.

A 9Fr sheath was inserted in the left common femoral vein (CFV) under ultrasound guidance. Diagnostic venogram showed total occlusion of left CIV and external iliac vein (EIV) (Fig. 1). The occlusion was crossed with a 0.35 hydrophilic wire (Advantage, Terumo, Somerset, NJ, USA) and predilated with 6 mm then 12 mm balloon. Immediate recoil was noted. Intravascular ultrasound (IVUS) (Vision PV, Volcano Inc.; Rancho Cordova, CA, USA) showed diffuse scarring of left CIV to EIV(Fig. 1A) and confirmed compression of left CIV by the adjacent iliac artery (Fig. 1B). Overlapping self-expandable venous stents 16 mm × 60 mm and 14 mm × 100mm (Abre, Medtronic, Minneapolis, MN, USA) was implanted from inferior vena cava (IVC) to CFV. Post dilatation was performed with 14 mm non-compliant high-pressure balloon. Excellent straight-line flow to IVC was established (Fig. 1). After this, the left renal vein (RV) was wired. IVUS interrogation confirmed elliptical compression of left renal vein between the superior mesenteric artery (SMA) and aorta (Fig. 2B). Direct stenting with a 10 mm × 60 mm self-expandable venous stent (Venovo, Bard Inc, Tempe, AZ, USA) was placed over the left RV ostium (Fig. 2). Post stenting IVUS showed good stent apposition and expansion of the venous lumen at both iliac and renal region (Fig. 1C-D and Fig. 2C.).

Patient was prescribed Apixaban and Clopidogrel for 1 month after the procedure and then life-long Apixaban. Repeat lower limb duplex 1 month later showed patent stent from distal IVC to left EIV. On

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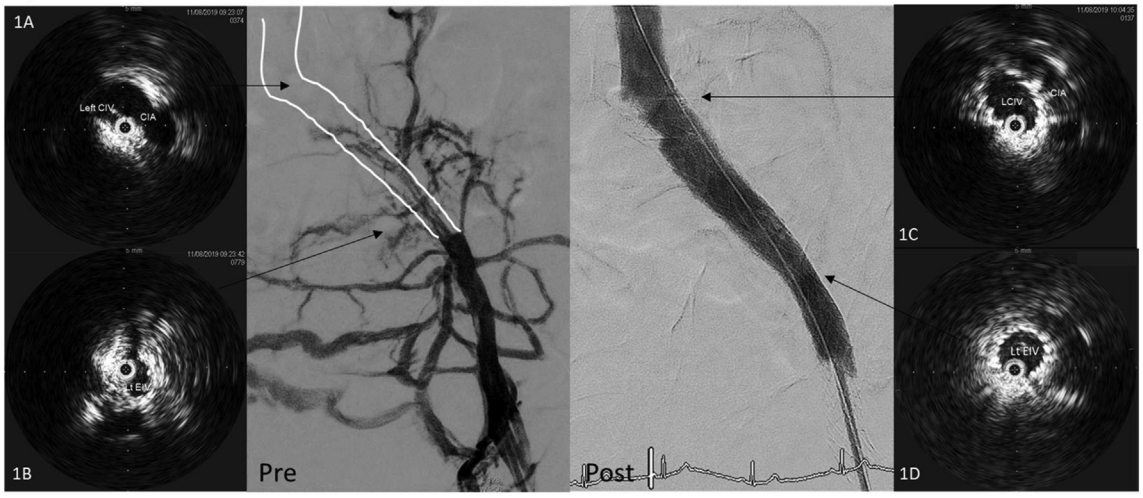

Fig. 1. Venography of pre- and post-venous stenting of left CIV. IVUS image 1A shows compression of the left CIV by the CIA, 1B shows fibrotic changes at left EIV, 1C shows good expansion of left CIV stent against the CIA, and 1D shows good expansion of left EIV stent. CIV: common iliac vein, CIA: common iliac artery, EIV: external iliac vein, IVUS: intravenous ultrasound.

6-month follow-up, patient experienced resolution of most of her PTS, with Villalta score of 6 and no more pelvic pain.

Discussion

Extrinsic venous compression by adjacent structures is a common cause of chronic venous disease [1]. Venous compression can occur at many different sites. The Nutcracker syndrome (NCS) refers to compression of the left RV between the aorta and superior mesenteric artery (SMA) due to an abnormally acute take-off angle of the SMA [2] (Fig. 2B). May-Thurner syndrome (MTS) is perhaps the most well-documented type of venous compression syndrome [3]. The classic description of the pathology of MTS reported compression of the left CIV by the overlying right common iliac artery. The pathophysiology of venous compression syndrome stems from the increase in venous pressure due to the obstruction, and from the chronic fibrotic stenosis due to the compression [1]. In NCS, the increased pressure within the RV leads to venous reflex into the gonadal and pelvic veins causing pelvic congestion syndrome manifesting most commonly as pelvic pain, microhematuria, and dyspareunia in female [2]. In MTS, the compression over the left CIV commonly causes symptoms of lower limb chronic venous insufficiency such as venous claudication, swelling and venous ulcer.

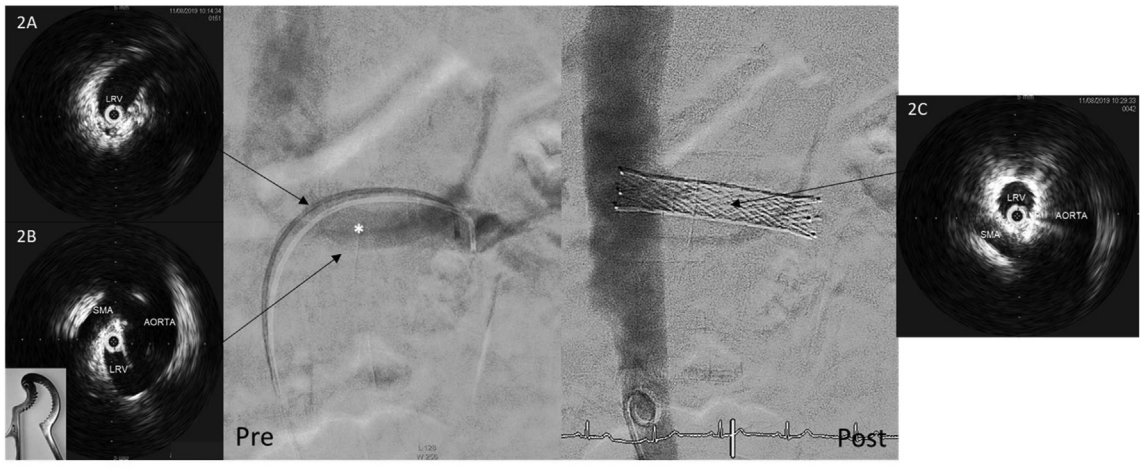

Fig. 2. Venography of pre- and post-venous stenting of left RV. IVUS image 2A shows proximal left RV as reference, 2B shows compression of left RV between the aorta and the SMA, with a picture of nutcracker as a reference to its namesake, and 2C shows good expansion of left RV after stenting against the compression. IVUS: intravenous ultrasound, SMA: superior mesenteric artery, RV: renal vein.

Risk of lower limb DVT is also increased in patient with MTS, as was in our patient. Diagnosis of venous compression can be made by digital subtraction venography, with multiple projections and obliquities. However, the compression might be frequently under-appreciated by the 2-dimensional venography [4]. IVUS is an invaluable imaging tool in addition to 2-dimension angiography to aid in both diagnosis and treatment of venous compression [5]. In our case, IVUS convincingly identified compression at both the CIV and left RV (Figs. 1A and 2B).

Endovascular treatment of NCS and MTS has been well reported [6]. Endovascular stenting has been shown to be both safe and effective treatment of venous compression syndrome, with good long-term patency rate [6]. New generation of dedicated venous stents offer both flexibility and high radial force, making them ideal scaffold in the tortuous venous anatomy. IVUS is useful in selection of appropriate stent diameter and length, and therefore should be considered in suitable cases [5].

Conclusion

In this case report, we described a case with concurrent NCS and MTS, successfully treated by IVUS-guided endovascular stenting.

Funding

There is no funding source for this article.

Conflicts of interest

There is no conflict of interest.

Ethical statement

As this is a retrospective case report intended for quality improvement and therefore should not be considered research, and do not require IRB approval.

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