

CASE REPORT

# Patient-Centered Discussion on Treating Chronic Vein Obstruction

Recanalization with both the Wallstent™ and Vici Venous Stent® to treat iliofemoral vein chronic occlusion.

BY OLIVIER HARTUNG, MD, MSc

A 39-year-old woman had a left iliofemoral acute deep venous thrombosis (DVT) 38 months before intervention. This DVT occurred 2 days after lumbar spine surgery and was medically treated by elastic stockings and low-molecular-weight heparin followed by warfarin, because the surgical procedure precluded interventional treatment of the DVT. Despite elastic stockings, the patient experienced venous claudication and thigh edema (> 3 cm in diameter) without skin lesions.

Duplex ultrasound showed a normal popliteal vein (PV), severe postthrombotic obstructive lesions of the femoral vein (FV), and a normal deep femoral and common FV (CFV) between the confluence and the saphenofemoral junction with an occluded cephalad CFV. Additionally, it also showed an external iliac vein (EIV) and common iliac vein (CIV) occlusion without deep axial reflux or contralateral and inferior vena cava lesions. CT venography confirmed these findings.

Based on this assessment, the patient was classified as having symptomatic edema (C3s), postthrombotic (Es),

deep veins (Ad), and obstruction only (Po). The patient's venous disability score and Villalta score were 3 and 11, respectively. No thrombophilia was found.

## TREATMENT OPTIONS

Medical therapy alone was insufficient. According to the European Society for Vascular Surgery guidelines, surgery is not recommended as a standard primary treatment, and recanalization and stenting is recognized as the first-line option to treat such lesions.<sup>1</sup> PV access was chosen because of the presence of FV obstructive lesions, but a jugular approach could have been used, too.

It must be highlighted that preoperative evaluation of the inflow and of the CFV lesions, postoperative care, and oral anticoagulation are essential to ensure good long-term results.

## COURSE OF THE PROCEDURE

The procedure was performed under local anesthesia with sedation. Access was achieved with echo-guided puncture of the left PV, and a 6-F sheath was inserted. Iliocavography confirmed preoperative findings with a severely diseased FV (Figure 1A), a good landing zone in the caudal part of the CFV, and a totally occluded left iliofemoral axis. Recanalization was performed using a 0.035-inch guidewire and a 5-F vertebral catheter. Then, the patient received 50 IU/kg of unfractionated heparin (UFH) and 250 mg of aspirin.

Predilatation was performed with a 16-mm-diameter Atlas percutaneous transluminal angioplasty dilation balloon (BD Interventional), followed by the deployment of three stents: one 16- X 120-mm Vici Venous Stent (Veniti, Inc.) in the left CIV and cephalad part of the EIV, one 16- X 90-mm Wallstent Endoprosthesis (Boston Scientific Corporation) in the CFV above the femoral confluence up to the caudal part of the EIV, and one 16- X 60-mm Wallstent to fill the gap between the two previous stents. All stents were postdilated using a

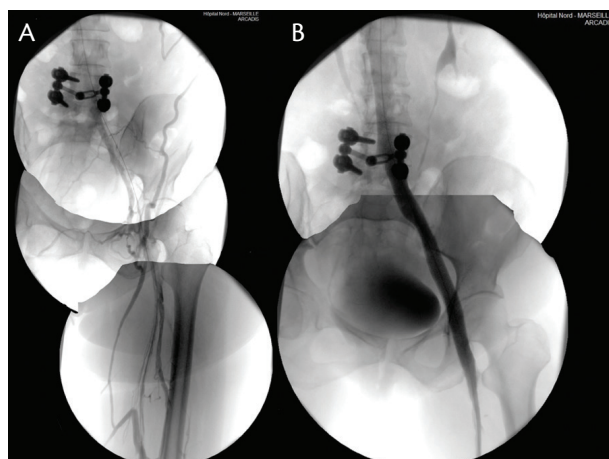


Figure 1. Before recanalization of an occluded left iliofemoral venous axis (A). After recanalization and stenting with a combination of a caudal Wallstent and a cephalad Vici Stent (B).

16-mm Atlas percutaneous transluminal angioplasty balloon before completion phlebography (Figure 1B) and sheath retrieval. Intermittent compression devices were used, and the patient received an intravenous perfusion of 20,000 IU per day of UFH.

## RESULTS

The patient was able to walk as soon as she returned to the ward (2 hours after the end of the procedure), and UFH was stopped that evening, then she had 14,000 units a day of tinzaparin in combination with warfarin and clopidogrel (goal international normalized ratio of 2.8–3.2). The patient was discharged on day 2.

Duplex ultrasounds were performed on day 1, then at 1, 3, 12 months, and annually thereafter. Venous claudication disappeared, and at 1 year, venous disability score and Villalta scores were 0 and 3, respectively. Oral anticoagulation was discontinued because it was a first and provoked DVT and because the result was excellent according to clinical and duplex criteria.

## DISCUSSION

A variety of stents are available for use in venous stenting. The Wallstent has been used for decades, and despite limitations in deployment accuracy, size, and the need to deploy the stent over the right CIV ostium when treating CIV obstructive lesions, the stent continues to offer several advantages. These advantages include good flexibility and resistance to compression, reconstrainability, absence of fracture, and positive results in the treatment of iliofemoral vein obstructive lesions as reported in numerous publications.<sup>2–4</sup> For more than 20 years, we have stented totally occluded veins, and in our experience treating 162 patients admitted for recanalization, the overall secondary patency rates were 88.3% at 90 months. However, when considering only patients who had a percutaneous procedure without endophlebectomy, patency rates were 90.9%.<sup>5</sup>

Laser-cut self-expanding nitinol stents have limited shortening during deployment, which allow precise positioning but can suffer from fractures; long-term results

are also sparse.<sup>6,7</sup> These stents are increasingly used in Europe (none have US Food and Drug Administration approval), and the main criteria for their use is precision. The Vici Venous Stent has a closed-cell design that gives it uniform crush resistance without compromising its flexibility. The delivery system is coaxial over-the-wire compatible with a 9-F sheath. It is under evaluation in the VIRTUS clinical trial, and feasibility cohort results were reported with 96% secondary patency for post-DVT patients.<sup>8</sup>

Our concept is to leverage the advantages of both types of stents for iliofemoral venous stenting while avoiding their limitations: a long nitinol stent into the cephalad part to avoid stent protrusion over the right CIV ostium and to stent down into the EIV and a Wallstent in the caudal part to avoid the risk of fracture under the inguinal ligament. ■

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