



# Left Common Femoral to Right Common Iliac Venous Bypass Through a Retroperitoneal Exposure

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The endovascular recanalization of the ilio caval system has replaced venous surgical reconstructions as the primary treatment option in severe post-thrombotic syndrome (PTS). We herein present a 51-year-old female with previous deep venous thrombosis, complicated with PTS with a large and complex circumferential calf ulcer measuring 25 cm of length in the left lower extremity. Venogram revealed a complete and extensive occlusion in the left iliofemoral system. A surgical bypass from the left common femoral vein to the right common iliac vein was performed. Patient recovered well and after 12 months postoperation her large wound is healing favorably with a clean and well granulated bed. Iliofemoral venous bypass is a feasible treatment for non-healing ulcer of lower extremity.

**Key Words:** Venous bypass, Retroperitoneal exposure, Post-thrombotic syndrome

Received August 24, 2018

Revised October 6, 2018

Accepted November 5, 2018

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Conflict of interest: None.

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Vasc Spec Int 2018;34(4):117-120 • <https://doi.org/10.5758/vsi.2018.34.4.117>

## INTRODUCTION

The endovascular recanalization of the ilio caval system has replaced venous surgical reconstructions as the primary treatment option in severe post-thrombotic syndrome (PTS) [1]. Venous surgical bypasses are rarely performed because of their complexity and factors affecting long-term results and data on patency of implanted bypass grafts in the venous system is lacking [1,2]. Patients with chronic outflow occlusion (COO) of the iliofemoral veins may present with PTS which is characterized by signs and symptoms of chronic venous insufficiency (CVI) typically after the occurrence of a deep venous thrombosis (DVT) being its commonest complication [1]. PTS is expensive and it significantly reduces the quality of life of patients. There is reported incidence of PTS near to 50% following an episode of DVT during the first year, despite the anticoagulation

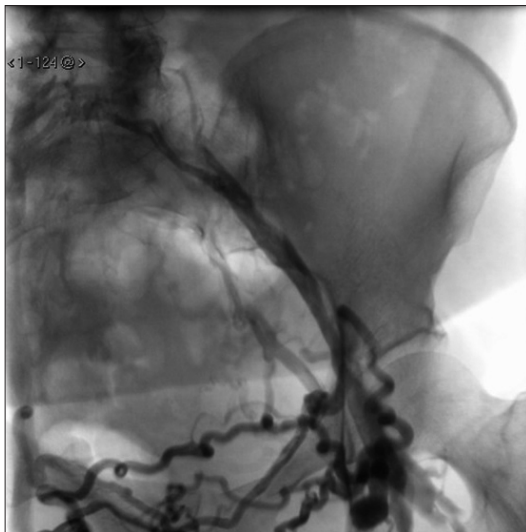
therapy [2,3].

In regard to pathophysiology of PTS, venous hypertension and valve dysfunction produce increase the venous and capillaries pressure and promote transudation of fluid and molecules which results in tissue edema, subcutaneous fibrosis, tissue hypoxia and ulceration [4]. The cornerstone of treatment in this process is still compression, however, not all patients tolerate compression when they have ulcers in their extremities, and up to 25% of these patients may require surgical or endovascular interventions due to symptoms and decreased quality of life [5].

We present a case of a female patient with a left lower extremity circumferential ulcer secondary to an extensive and chronic DVT, resolved with a polytetrafluoroethylene (PTFE) bypass in the venous system.

## CASE

A 51-year-old female with previous comorbidities of hypertension and CVI arrived to the emergency department in 2016 with a left circumferential leg ulcer of approximately 4 months secondary to a DVT of iliofemoral vein apparently. Upon arrival, she was found alert and uncomfortable due to great pain. Physical examination was notable for tachycardia and a circumferential left leg ulcer with subcutaneous tissue, bone, muscle and tendons exposed. Laboratory data revealed a hemoglobin of 7.7 g/dL, white blood cells of 7,600, platelets of 452,000, C-reactive protein of 1.66 mg/dL; creatinine, blood urea nitrogen and electrolytes were within normal limits. A computed tomography angiography was ordered revealing an extensive and chronic thrombosis of the left iliofemoral vein. A contrast venography revealed occlusion of left iliac vein (Fig. 1). Following discussion



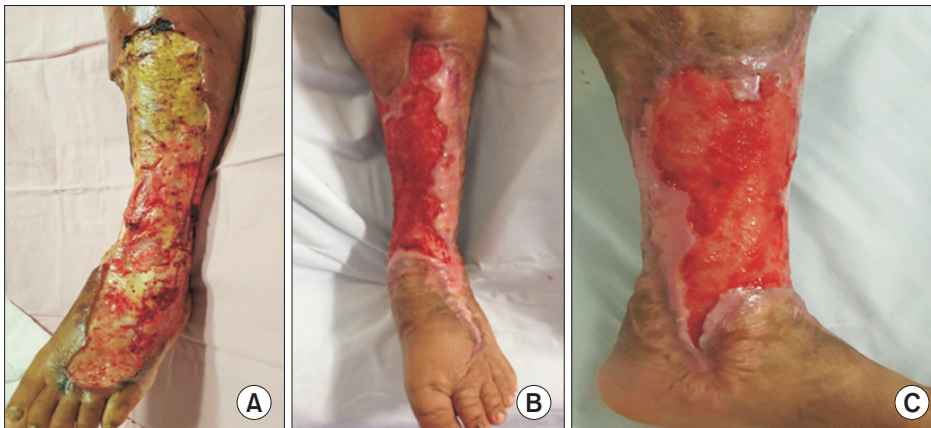
**Fig. 1.** Ascending venogram shows chronic left iliofemoral vein complete obstruction, draining through pelvic collateral.

with the patient regarding the costs, risks and benefits of the endovascular and surgical alternatives, she opted for the open surgical approach. In our institution patients pay for the endovascular resources, she is a low income patient and she could not afford endovascular treatment.

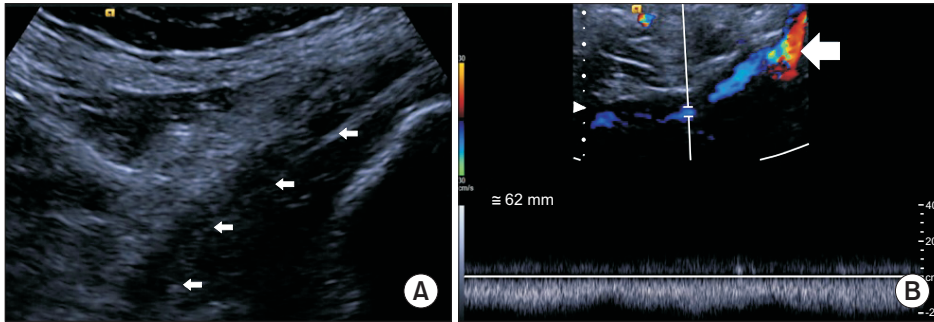
We performed a left common femoral-right iliac vein bypass with and externally supported ePTFE 10 mm graft and right iliac vein was exposed with a transverse incision and retroperitoneal exposure. The postoperative period was complicated with pneumonia which resolved with intravenous antibiotics, low molecular weight heparin was initiated 24 hours after surgery and bridged to warfarin 3 days later maintaining international normalized ratio therapeutic range of 2-3 during follow-up. Additionally, wound care was done by nurses in our wound clinic. The patient was discharged with warfarin and compressive bandage two months after surgery. During follow-up the ulcer decreased in size, granulation tissue appeared (Fig. 2). At 12 months, the Doppler ultrasound showed patent bypass (Fig. 3), and she is scheduled for skin grafting.

## DISCUSSION

Chronic outflow obstruction can have a thrombotic or a non-thrombotic etiology, such as extrinsic compression related to malignant or anatomic variants like May-Thurner syndrome [1,6]; COO can cause symptoms like limb swelling, venous claudication and ulceration in rare cases [7] and result in disability if left unattended [8]. Tobacco abuse, previous DVT and obesity are considered risk factors for PTS [8]. In the case here presented, the patient had a history of extensive DVT. It has been reported that only 20%-30% of iliac vein thrombi fully recanalize with anticoagulation therapy [9]. Patients with ulcers greatly benefit from interventions to recanalize venous obstruction improving their quality of life [10]. There are 2 main types of treatments for chronic venous obstruction; endovascular therapy



**Fig. 2.** (A) Preoperative circumferential calf ulcer with fibrin and necrosis. (B, C) Ulcer after surgery and wound care at 5 and 10 months of follow-up respectively with re-epithelialized and granulation tissue.



**Fig. 3.** Ultrasound images of iliofemoral bypass. (A) Patent iliofemoral bypass (white arrows). (B) Doppler ultrasound of patent distal anastomosis in iliac vein (white arrow).

and open surgical venous reconstruction. Endovascular treatment is considered the method of choice in proximal and short iliofemoral obstruction because this is a safe and minimally invasive technique [6,9]. In a study performed by Neglén et al. [11] in which his group studied a total 982 limbs that had been endovascularly treated for chronic lesions in the femoro-iliocaval system, the authors found that primary patency and secondary patency were 67% and 93%, respectively after 72 months of follow-up. Furthermore, it has been reported to have better results when used to treat non-thrombotic venous obstruction while being expensive and less successful if used in patients with long femorocaval or iliocaval obstructions [9,10]. For some patients open surgical or hybrid reconstructions are the optimal option of treatment. Surgical reconstruction nowadays is rarely performed and is left by clinicians as a last resort if endovascular procedures fail, if it is not feasible due to economic problems, however, this procedure may be the only option for some patients. Open venous reconstruction for ilio-femoral or inferior vena cava obstructions have been reported to offer a 3-year primary and secondary patency rates of 54% and 62%, respectively [8]. Previous reports documented these patency rates in patients anticoagulated with warfarin, and this is why those patency rates are elevated with the new oral anticoagulants. It is known that greater saphenous vein (SV) had better patency than PTFE [8]. Among surgical options, the Palma-Dale procedure is the first option to consider in patients with unilateral iliac vein occlusion with reported patency rates of 83% after 4 years of follow-up using the autologous SV [8,10]. In patients with small or diseased SV, graft material is an optimal

option. PTFE is considered the preferred conduit for the reconstruction of femoral, iliocaval or caval obstructions while autologous saphenous veins are unavailable [7]. Jost et al. [8] reported in 2001 acceptable secondary patency rate of 13 iliocaval bypass grafts at 2 years of 54% also 64% of patients noted clinical improvement demonstrating that venous graft bypass is feasible, secure and adequate. The use of an arteriovenous fistula is still controversial, some arguing better graft flow and others worse survival [8,9]. Graft surveillance should be done with duplex ultrasound at 3, 6, and 12 months postoperatively and then every 6 months for life [8].

In conclusion, iliofemoral venous bypass is a feasible and effective treatment option for severe PTS patients to improve the wound healing and quality of life.

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