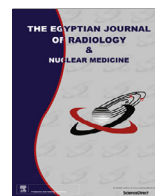


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Original Article

Iliofemoral stenting for chronic venous occlusive disease: Initial and mid-term outcomes in single institution

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ABSTRACT

Aim of the work: To evaluate and report the initial and midterm outcomes of endovascular venous stenting in cases suffering from chronic venous insufficiency due to iliac and common femoral vein obstruction.

Patients & methods: Patients with chronic venous insufficiency were referred to our institution during the period from January 2014 to October 2015. CT venography was performed to evaluate site and extent of proximal venous stenosis or obstruction. Then conventional venography and endovascular stenting were done. The patency of the stents was assessed at short and midterm follow-up examinations.

Results: CT venography revealed proximal iliac vein obstruction in 9 cases and common femoral vein obstruction in 3 cases. All were post-thrombotic. Technical success was 67% (8/12) with no immediate major complications. Follow-up CT venography done 1 month post-procedure revealed no restenosis. After one year 8 patients showed overall improvement of symptoms with decrease in lower limb edema, swelling and pain.

Conclusion: Stent implantation for symptomatic ilio-femoral venous obstruction is a safe and effective procedure to resolve venous disease symptoms. Despite the small number of patients, initial and mid-term outcome has been good.

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1. Introduction

Chronic iliac and femoral vein occlusion or stenosis due to deep vein thrombosis or non-thrombotic conditions is an important cause of venous outflow obstruction and may lead to post-thrombotic syndrome and chronic venous insufficiency [1]. The resulting leg swelling, venous claudication, skin changes, and ulceration, have been linked to a significant deficit in quality of life [2,3].

However this anatomic obstruction is frequently overlooked, owing in part to diagnostic difficulty [4]. Treating these cases by conventional ways (as primary varicose veins) will exaggerate the symptoms as it eliminates the collateral pathway for venous hypertension. Because the clinical symptoms may be identical while the pathologic changes are vastly different, the clinical diagnosis is not a good predictor of the extent of venous damage [5].

Doppler ultrasound offers a high accuracy for the detection of lower limb deep venous thrombosis (DVT), but on the contrary pelvic veins are often inadequately visualized due to a limited acoustic window (e.g. due to bowel gas). Thus, CT-venography (CTV) has been propagated as an alternative test for the detection of DVT [6]. It also identifies other causes of non-thrombotic venous obstruction.

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Percutaneous venoplasty and stenting have become the preferred treatments for IVC and iliac vein obstruction, providing symptom relief and clinical improvement with encouraging early and intermediate outcomes [1,7].

The aim of this study was to evaluate and report the initial and mid-term outcomes of endovascular venous stenting in cases suffering from chronic venous insufficiency due to iliac and common femoral vein obstruction.

2. Patient and methods

This is a prospective study done after approval of the ethical committee and all patients signed an informed consent.

2.1. Case selection

- Patients with chronic venous insufficiency referred to our institution during the period from January 2014 to October 2015 to do endovascular procedure were included in this study.
- Criteria for selection included; patients suffering from chronic venous insufficiency presented with lower limb edema, venous claudications, leg ulcer or varicose veins that were unresponsive to other types of therapy (conservative treatment and surgery).
- Cases were excluded in the following situations; when Duplex examination showed acute DVT, when CT venography revealed no abnormality in the deep veins, when there is bleeding tendency and interventional procedures are contra-indicated.
- Etiology of the patient's venous obstruction was determined based on patient history, findings in the preoperative workup, and intraoperative data.

2.2. Clinical examination

- All patients were examined during standing and recumbent position, CEAP grading was used, and the presence of dermatitis, swelling, edema visible varicosities, or leg ulcer was assessed and recorded. Venous claudication which is defined as calf pain developed after 5 min of stepping test [8] was also assessed and recorded.
- Complete history taking as regards previous DVT, major operation with long duration of bed rest, exogenous hormone therapy, other co-morbidities and history of smoking.

2.3. Imaging

- All patients were evaluated first by Duplex scan during standing and recumbent position to assess the patency of external iliac, common femoral, superficial femoral and popliteal veins as well as assessment of incompetent valves in deep and superficial systems.
- CT venography was done for all patients included in this study to assess patency of the deep venous system. It was performed using a multi-detector CT scanner (Brilliance 64, Philips Healthcare, Best, The Netherlands). The parameters for CT venography were

beam collimation, 64 × 0.625 mm; pitch 1:0.891; slice thickness 2 mm; and reconstruction interval, 1.25 mm. Images were obtained with the patient in the supine position. After 3.5 min, indirect CT venography is subsequently performed from above the iliac bifurcation to the ankle joint.

A total of 2.0 mL/kg of bodyweight of iohexol (Omnipaque 350; Amersham, Cork, Ireland) and then 30 mL saline bolus were injected with a flow rate of 3.5 mL/s.

Table 1

Demographic characters of patients included in this study.

Age	
Mean (range)	31 years (range, 12–43 years)
Sex	
Male	4
Female	8
Risk factors	
History of DVT	8
Obesity (BMI > 30)	4
Recent major operation	2 (caesarean section)
Exogenous hormone therapy	0
Other co-morbidities	
DM	3
Hypertension	2
Renal disease	1
Coronary artery disease	0
COPD	0
Autoimmune disease	0
Smoking	1

Table 2

Summary of clinical, pathological findings in 12 cases included in this study.

Clinical class	
0–1	0
2 (Varicose vein, pain)	1
3 (Venous edema)	6
4a (Dermatitis, hyperpigmentation)	3
4b (Lipodermatosclerosis, white scar)	0
5 (Healed ulcer)	0
6 (Active ulcer)	1
Venous claudications	4
Etiology	
Secondary (post-thrombotic)	12
Color coded Doppler sonography findings	
Acute DVT	0
Reflux	
Superficial system alone	0
Deep system alone	0
Superficial and deep system	8

Table 3

Demonstrate site of proximal venous obstruction in 12 cases.

	Right	Left
Common iliac	4	2
External iliac	3	2
Common femoral	1	2

NB: 2 cases showed stenotic segment involving common iliac vein and extending to external iliac veins.

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