

## Long-term outcome of transfemoral thrombectomy in patients with acute iliofemoral vein thrombosis

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### Abstract

**Background:** The optimal therapy of acute iliofemoral venous thrombosis is still a matter of debate. The purpose of our study was to evaluate the late results of iliofemoral thrombectomy with regard to the prevention of the development of a Post Thrombotic Syndrome (PTS).

**Methods:** During 2000-2003, 18 patients underwent transfemoral venous thrombectomy for acute iliofemoral venous thrombosis. 16 patients were reexamined after a 5-year follow-up. At follow-up, the patency of venous segments as well as the development of reflux was investigated by duplex-ultrasound. Furthermore, clinical signs and symptoms of PTS in patients were recorded.

**Results:** Clinical pulmonary emboli did not occur in the perioperative period. Two patients died because of disseminated metastatic cancer and another after massive retroperitoneal bleeding due to anticoagulation therapy. In a 5-year follow up, 31% had valvular reflux. Venous patency rate was 75%. The rate of PTS was 37.5% without the severe form of PTS. Patients did not have healed, healing, and/or active venous ulcer.

**Conclusion:** It is thought that vein patency and valvular function were relatively restored, and PTS was prevented after surgical thrombectomy. Vascular surgeons should include venous thrombectomy as a part of their routine operative armamentarium, offering this procedure to patients with iliofemoral DVT, especially if other options are not available or have failed.

**Keywords:** DVT, iliofemoral thrombosis, venous thrombectomy, PTS, valvular reflux, vein patency.

### Introduction

Deep vein thrombosis (DVT) is a common and costly medical problem with serious morbid complications such as pulmonary emboli and post-thrombotic syndrome [1,2,3,4].

The goal of treatment of acute DVT has been directed toward reduction of pain and swelling of the involved leg, limiting the progression of

existing clot and preventing pulmonary emboli and recurrent thrombosis, and prevention of disabling post-thrombotic syndrome by restoration of venous patency, preserving normal functioning valves and preventing reflux [4,5,7,9,14,15,16,17,18,24,27].

PTS is the most important late sequel of DVT that develops as a result of persistent venous obstruction, incompetent venous valves, or both [4,5,7,9,14,15,16,17,18,19,24,27]. The

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overall outcome of DVT, in terms of disturbed venous physiology, depends to a great extent on the location of the thrombosed segments and the extent of involvement [10,21]. Studies have shown that DVT of the distal calf veins has a low occurrence of PTS compared to iliofemoral vein thrombosis [3,6,17,21]. Treatment options for acute iliofemoral vein thrombosis have expanded in recent years and now include systemic anticoagulation therapy, systemic thrombolytic therapy, catheter directed thrombolytic therapy, and surgical thrombectomy [16,17,18,20]. Yet, today we are still faced with the dilemma of which treatment will provide the best acute management, has minimal risks and prevents long term sequelae more effectively as evidenced by PTS [6,8,13]. Unfortunately, current published guidelines do not recommend venous thrombectomy. Rather, they recommend against its use because of the poor results initially reported [2,3,6]. However, now in regard to better surgical technique and patient selection, surgical thrombectomy has had a significant role in treatment of these patients [2,3,6,13,17,24,27]. The aim of this study was to evaluate the long term outcome of surgical thrombectomy, including valvular reflux, recanalization of veins and PTS in patients with acute iliofemoral vein thrombosis.

### Methods

This retrospective study was conducted on 18 patients diagnosed with iliofemoral DVT between 2000 and 2003 who were treated with surgical thrombectomy. Patients' records were obtained from the Vascular Ward of Shohada-e-Tajrish Hospital. Diagnosis of DVT was confirmed through review of color-flow duplex scans performed by an experienced radiologist. Diagnosis of DVT was made on the basis of the finding of all four criteria: 1) non-compressibility of the vein, 2) dilatation of the vein, 3) lack of a Doppler signal, and 4) lack of visible flow. Only those patients who were found to have iliofemoral DVT, defined as

any deep vein clot involving the iliac veins or lower, were chosen for this study. Patients were treated with transfemoral thrombectomy followed by arteriovenous fistula (greater saphenous vein to superficial femoral artery), intravenous unfractionated heparin and oral warfarin with an International Normalized Ratio level of 2-3. All patients in the perioperative period were frequently reexamined for signs and symptoms of bleeding, pulmonary emboli, recurrence of DVT, and other complications. After a 5-year follow up, 16 patients were reexamined. Incidence of venous recanalization, development of reflux, and PTS were recorded.

Development of recanalization, defined as any resolution or lysis of the clot involving the deep veins, and valvular reflux of patients were studied by review of color-flow duplex scans. We defined significant reflux as retrograde flow that lasted more than 0.5 seconds in the deep veins. Signs and symptoms of PTS included pain, swelling, skin hyperpigmentation, venous claudication, and ulcer.

### Results

Eighteen patients with acute iliofemoral vein thrombosis were treated with surgical thrombectomy.

Clinical characteristics are shown in Table 1. Predisposing risk factors for DVT in these patients are shown in Table 2. Three patients (16.5%) had more than one risk factor. The mean time of hospital stay was 10 days (range: 6-13 days). Perioperatively, two patients (11%) died; one had extensive metastatic cancer and the other died after massive retroperitoneal hemorrhage due to anticoagulation therapy. In the perioperative period, clinical pulmonary emboli did not occur. The only early complication was surgical site infection that occurred in one (5.5%) patient. On follow up 16 patients were reexamined after 5-years. Two patients (11%) had recurrence of DVT; symptoms in acute phase were milder compared to the first episode of DVT. The rate of recanalization in

Characteristic	N.(%)
-Number of patients	18 (100%)
-Sex	
Male	4 (22%)
Female	14 (78%)
-Site of DVT	
Right	1 (2.5%)
Left	17 (94.5%)
-Age (year)	
Mean	51
Range	18-75
-Past history of DVT	
Negative	18 (100%)
Positive	0
-Initiation of symptoms(day)	
Mean	3
Range	1-5

Table 1. Clinical characteristic of patients with iliofemoral DVT.

common iliac, external iliac, common femoral, superficial femoral, popliteal, and calf veins on duplex scan were 100%, 75%, 81%, 81%, 87.5%, and 100%, respectively. 5 patients (31%) developed reflux in at least one deep venous segment over a 5-year follow up. The signs and symptoms of PTS were found in 6 patients (37.5%); 10 patients (62.5%) were asymptomatic in a 5-year follow up. Healing or active venous ulcers were not seen in patients with PTS.

**Discussion**

Some studies have shown that patients with iliofemoral DVT have higher rates of PTS [3,6,17,21]. However, many studies have shown that early relief of obstructing thrombus by thrombolysis or thrombectomy could pre-

vent more extensive PTS [1,2,3,6,17,42]. The underlying pathophysiology of PTS is ambulatory venous hypertension that develops as a result of persistent venous obstruction, incompetent venous valves or both [4,5,7,9,14,15,16,17,18]. Akesson and coworkers showed that in a 5-year follow up of patients with DVT that were treated with anticoagulation alone, the rate of ambulatory venous hypertension was 95% and 90% of patients had signs and symptoms of chronic vein insufficiency [30]. Results of our study in prevention of valvular reflux and PTS, and restoration of venous patency rate are relatively similar to the previous study [11,13,22,26,28,29] and when compared to studies [22,23,25,29,30] with systemic anticoagulation therapy alone, it is a relatively effective and successful treatment approach. Investigators recommend this aggressive approach with rapid removal of the occluding thrombus in the leg veins extending up into the iliac veins in active patients with a short history of symptomatic DVT, usually less than 7 days [3,12,20,24,27]. This approach is not justified in chronically ill, bedridden, high risk or aged patients, or those with serious intercurrent disease or limited life expectancy [3,12,20,24,27]. In these patients, such interventions can only be indicated for limb salvage in phlegmasia cerulea dolens when conservative treatment does not prevent the development of an acute compartment syndrome with venous gangrene [3,12,20,24,27]. In regard to the relatively beneficial effect of this approach, vascular surgeons should consider venous thrombectomy as a part of their routine operative procedure, offering it to patients with iliofemoral DVT, especially if other options are not available or have failed. However, it is required that the investigators confirm the better effect of surgical thrombectomy as compared to anticoagulation therapy alone in patients with acute iliofemoral DVT in a prospective randomized clinical trial.

Risk factor	N.(%)
Hormonal therapy (OCP)	5 (27.5%)
Postoperative	4 (22%)
Smoking	4 (22%)
Trauma	2 (11%)
Malignancy	1 (5.5%)
Thrombophilia	2 (11%)
Idiopathic	4 (22%)

Table 2. Clinical risk factors in patients with iliofemoral DVT.

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