Comparative study between medical treatment and intervention in acute ilio-femoral DVT

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Submitted by

Mahmoud Fekry Mahmoud Ashour
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Faculty of Medicine – Cairo University

Under the supervision of

Prof. Dr. Rafik Ramsis Morcos
Professor of General Surgery,
Faculty of medicine Ain Shams University

Dr. Abd El Rahman Mohamed Ahmed
Lecturer of general surgery and vascular surgery,
Faculty of medicine Ain Shams University

AIN SHAMS UNIVERSITY

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- **ACCP:** American college of chest physicians.
- **aPTT:** activated partial thromboplastin time.
- **AVF:** arteriovenous fistula.
- **BMI:** body mass index.
- **CDT:** catheter-directed thrombolysis.
- **COPD:** chronic obstructive pulmonary disease.
- **COX:** cyclooxygenase enzyme.
- **CT:** Computed Tomography.
- **CTV:** Computed Tomographic venography.
- **CVD:** chronic venous disease.
- **DVT:** deep venous thrombosis.
- **ELISA:** enzyme linked immunosorbent assay.
- **FDA:** Food and Drug Administration.
- **GCSs:** Graduated compression stockings.
- **HIT:** Heparin-induced thrombocytopenia.
- **INR:** international normalized ratio.
- **IPC:** Intermittent pneumatic compression.
- **IVC:** inferior vena cava.
- **ISPMT:** isolated segmental pharmacomechanical thrombolysis.
- **LMWHs:** Low-Molecular-Weight Heparins.
- **MRI:** magnetic resonance imaging.
- **MRV:** Magnetic resonance venography.
- **MTHFR:** methyltetrahydrofolate reductase.
- **PAI-1:** plasminogen activator inhibitor-1.
- **PE:** pulmonary embolism.
- **PTS:** post thrombotic syndrome.
- **QoL:** quality of life.

- **Rt-PA:** recombinant tissue plasminogen activator.
- **THR:** total hip replacement.
- **UFH:** unfractionated heparin.
- **VKAs:** vitamin k antagonists.
- **VTE:** venous thromboembolic disease.

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Introduction

The complications of acute venous thromboembolism (VTE) including deep venous thrombosis (DVT), pulmonary embolism (PE), and post-thrombotic syndrome, are important as they are most common preventable causes of hospital death**. (Hull RD, et al., 1986)**.

Recurrent thrombotic events appear to compete with recanalization early after acute DVT. The importance of such events is well recognized clinically, although their frequency in patients studied prospectively has only recently been described. Most clinical studies have included both recurrent DVT and PE, with rates depending on treatment, location of the thrombus, and duration of follow-up. In patients with proximal DVT, recurrent thromboembolic events have been reported in 5.2% of those who were treated with standard anticoagulation measures for 3 months as compared with 47% in those who were inadequately treated with a 3-month course of low-dose subcutaneous heparin. Proximal propagation may also complicate isolated calf vein thrombosis in up to 23% of untreated patients. **(Philbrick JT, et al., 1988).**

PE, with its attendant mortality, is the most devastating complication of acute DVT. When associated with acute DVT, the majority of PE episodes may be clinically silent. In patients with symptomatic DVT 50% to 80% have evidence of asymptomatic PE. Conversely, in those with symptomatic PE, asymptomatic DVT can be demonstrated in about 80% of cases. **(Buller HR, et al., 2005)**.

Though less dramatic than PE, development of post thrombotic syndrome is the most important late complication of acute DVT, and it is responsible for a greater degree of chronic socioeconomic morbidity. As many as 29% to 79% of patients may have some degree of long-term manifestations such as pain, edema, heaviness, or hyperpigmentation, but severe manifestations occur in only 7% to 23%, while ulceration occurs in 4% to 6% of patients. **(Meissner MH, et al., 2007).**

The most common symptoms and signs of DVT have a wide range of reported sensitivities and specificities. For example, calf pain has a sensitivity of 75% to 91% and a specificity of 3% to 87%, and calf swelling has a sensitivity of 35% to 97% and a specificity of 8% to 88 %. **(Anderson Jr FA, et al., 2007).**

Duplex ultrasonography has almost completely replaced Contrast Venography as the diagnostic test of choice for the detection of DVT. The benefits of duplex ultrasonography over Contrast Venography include a lack of radiation, portability, noninvasiveness, and relative cost effectiveness. In addition, ultrasound has the ability to distinguish among nonvascular pathologies, such as inguinal adenopathy, Baker's cyst, abscess, and hematoma. The main concern regarding ultrasound is whether its diagnostic ability is comparable to that of Contrast Venography. **(Goodacre S, et al., 2005).**

The objectives in treatment of acute DVT are to prevent thrombus extension, early recurrence, and death from PE. In addition, treatment should attempt to prevent late recurrences and long-term consequences such as the development of Post Thrombotic Syndrome and chronic pulmonary hypertension. Since the landmark paper by Barrit and Jordan approximately 60 years ago, anticoagulation remains the mainstay of VTE treatment. In most cases, the initial treatment of DVT and PE is similar. Indeed, as many as 20% to 25% of patients with symptomatic DVT have asymptomatic PE when routine imaging techniques are performed.**(Eldor A., 2001).**

Patients with VTE should be treated with anticoagulants as soon as the diagnosis is confirmed by objective imaging techniques. However, if clinical suspicion is very high, treatment should be initiated until the diagnosis can be confirmed. There are two options for the initial anticoagulant treatment of VTE: (1) intravenous or subcutaneous UFH and (2) subcutaneous LMWHs. The current recommended approach is to start heparin or LMWH and VKAs together at the time of diagnosis and to overlap them for 5 to 10 days, with UFH or LMWH discontinued when the prothrombin time, expressed as the INR, is within the target (2.0 to 3.0) for 2 consecutive days. **(Pabinger I, et al., 1994).**

The basic mechanism of thrombolysis is the activation of fibrin-bound plasminogen and resultant production of plasmin. **(Sandoval JA, et al., 2008).**

It is intuitive that delivery of the plasminogen activator within the thrombus would be more effective and potentially safer than systemic infusion of plasminogen activators. Additionally, intrathrombus delivery protects plasminogen activators from circulating plasminogen activator inhibitor and, more importantly, protects the active enzyme plasmin from neutralization by circulating antiplasmin. If lysis can be accelerated, the overall dose and duration of plasminogen activator infusion should be reduced, thereby decreasing the risk for treatment related complications**. (Sandoval JA, et al., 2008).**

Isolated Segmental Pharmacomechanical Thrombolysis. An interesting new technique is isolated segmental pharmacomechanical thrombolysis (ISPMT), which is achieved by using the Trellis catheter (Bacchus Vascular, Santa Clara, CA). This double-balloon catheter is inserted Into the thrombosed venous segment with the proximal balloon positioned at the upper edge (cephalic end) of the thrombus. When the balloons are inflated, plasminogen activator is infused into the thrombosed segment isolated by the balloons. The intervening catheter assumes a spiral configuration and spins at 1500 rpm for 15 to 20 minutes. The liquefied and fragmented thrombus is aspirated and treatment successes evaluated by repeat segmental phlebography. **(Binkert CA, et al., 2006).**