Role of Thrombolytic Therapy in the Management of Acute Iliofemoral Deep Venous Thrombosis

Essay

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By

Ali Abdallah El Saadany

M.B, B. Ch

Faculty of Medicine

Under Supervision of:

Prof. Dr. Wagih Fawzy Abd El-Malek

Prof. of General and Vascular Surgery

Faculty of Medicine - Ain Shams University

Dr. Atef Abd Al-Hameed Desoky

Assistant Prof. of General and Vascular Surgery

Faculty of Medicine - Ain Shams University

Dr. Mohamed Ismail Mohamed

Lecturer of General and Vascular Surgery

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain shams university

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بسم الله الرحمن الرحيم
وَأَنزَلَ اللَّهُ عَلَيْكَ
الْكِتَابَ وَالْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ تَكُن تَعْلَمُ
وَكَانَ فَضْلُ اللَّهِ
عَلَيْكَ عَظِيمًا
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List of Contents

List of Abbreviations

ACCP	:	**American college of chest physicians.**
ACL	:	**Anticardiolipin antibodies.**
ACT	:	**Activated clotting time.**
AHRQ	:	**The Agency for Healthcare Research and Quality.**
APC	:	**Activated Protein C.**
aPTT	:	**Activated partial thromboplastin time.**
AVF	:	**Arteriovenous fistula.**
CDDUS	:	**Colored Doppler Duplex Ultra-Sound.**
CDRs	:	**Clinical decision rules.**
CDT	:	**Catheter directed thrombolysis.**
CFV	:	**Common Femoral Vein.**
CIA	:	**Common Iliac Artery.**
CTEPH	:	**Chronic thrombo-embolic pulmonary hypertension.**
CTPA	:	**CT pulmonary angiography.**
CTV	:	**Computed tomography venography.**
CVH	:	**Chronic venous hypertension**
DIC	:	**Disseminated intravascular coagulation.**
DTIs	:	**Direct thrombin inhibitors.**
ELISA	:	**Enzyme-linked immunosorbent assay.**
GCS	:	**Graduated compression stockings.**
GPIb	:	**Glycoprotein Ib.**
GSV	:	**Great saphenous vein.**
HIT	:	**Heparin-induced thrombocytopenia.**
INR	:	**International normalized ratio.**
IPC	:	**Intermittent pneumatic compression.**
IPG	:	**Impedance plethysmography.**
ISPMT	:	**Isolated segmental pharmacomechanical thrombolysis.**
IVC	:	**Inferior vena cava.**
LMWH	:	**Low molecular weight heparin.**

List of Abbreviations

MRV	:	**Magnetic resonance venography.**
PA		**Pulmonary Artery.**
PAI	:	**Plasminogen activator-inhibitor.**
PCD		**Phelegmasia Cerula Dolens.**
PE	:	**Pulmonary embolism.**
PEEP	:	**Positive end-expiration pressure.**
PMT	:	**Pharmaco-mechanical thrombectomy.**
PT	:	**Prothrombin time.**
PTS	:	**The post-thrombotic syndrome.**
rt-PA	:	**Recombinant Tissue Plasminogen Activator.**
SFJ	:	**Saphenofemoral junction.**
SPJ		**Saphenopopliteal junction.**
SSV	:	**Small saphenous vein.**
tPA	:	**Tissue plasminogen activator.**
TXA2	:	**Thromboxane A2.**
UFH	:	**Unfractionated heparin.**
VKA	:	**Vitamin K antagonists.**
VTE	:	**Venous thrombo-embolism.**

List of Tables

List of Tables

List of Figures

List of Figures

List of Figures

INTRODUCTION

Deep venous thrombosis (DVT) of the lower limb is a serious, even life-threatening condition requiring treatment primarily to avoid the morbidity and mortality associated with its most serious acute complication pulmonary embolism (PE) ***(Gogalniceanu et al., 2009)***.

Significant complications associated with dvt include pulmonary emboli which cause 10% of inpatient deaths, phlegmasia caerula dolens (PCD) leading to limb- threatening venous gangrene and sever morbidity secondary to chronic venous hypertention and post – thrombotic syndrome (PTS) ***(Gogalniceanu et al., 2009)***.

PCD is characterized by limb cyanosis and swelling as a result of thrombosis at a capillary level. This is of clinical importance as it has an associated mortality and many survivors ultimately develop venous ulceration ***(Gogalniceanu et al., 2009).***

Unfortunately few are fully aware of the delayed complication of acute DVT postthrombotic syndrome which can occur month to years following acute DVT ***(Mark and Signe, 2000)***.

PTS is caused by chronic venous hypertension secondary to venous reflux, venous obstruction and valvular dysfunction with the clinical sequelae of leg pain, oedema, venous trophic

changes and chronic ulceration. It is estimated that up to 80% of patients with a DVT may go on to develop symptoms of PTS, 4-15% progress to leg ulceration ***(Gogalniceanu et al., 2009).***

Ilio-femoral DVTs are most likely to lead to PTS as the ilio-femoral segment of the venous system is the single outflow channel for the lower extremity. Occlusion of this outflow tract leads to high venous pressures and post-thrombotic morbidity as long term sequelae ***(Comerota et al., 2012).***

Treatment of this condition is constantly changing, the ideal goals of therapy for acute DVT are elimination of the embolic potential of existing thrombus, restoration of unobstructed flow, preservation of venous valve function. Meeting these goals will not only prevent PE but will also minimize the long-term sequelae of venous hypertention and the development of PTS ***(Mark and Signe, 2000)***.

Multiple treatment options including anticoagulation, surgical venous thrombectomy and thrombolytic therapy achieve these goals to a variable degree. Standard treatment of DVTs involves anticoagulation with low molecular weight heparine (LMWH) or unfractionated heparin (UH), followed by long term therapy with vitamin k antagonists, such as warfarin. This has been shown to effectively reduce the risk of thrombus propagation or recurrence, pulmonary embolism and death. Nevertheless, anticoagulants have little impact on reducing

thrombus size in the short term, being ineffective in the mangment of PCD. Furthermore, their inability to cause thrombus dissolution may not prevent the development of post-thrombotic limb syndrome in the long term in many patients ***(Mark and Signe,2000)***.

Treatment strategies aimed at eliminating or reducing the risk of PTS should focus on preserving valvular function and eliminating the risk of continued venous obstruction following acute DVT. Surgical removal by means of thrombectomy techniques combined with creation of arteriovenous fistulas have been employed successfully in Europe and the united states, but overall such procedures have not been commonly performed ***(Mark and Signe, 2000).***

The feasibility of more invasive techniques aimed at reducing thrombus burden has gained increasing interest in recent years. Initially, systemic thrombolysis (with urokinase, streptokinase or tissue plasminogen activator) demonstrated adequate clot lysis, but exposed patients to unacceptable side-effects, including intracranial haemorrhage, significant retroperitoneal haematomas ***(Suresh et al., 2002)***.

Catheter directed thrombolysis (CDT) involves a focused delivery of plasminogen activating agents directly into the thrombus. This may be more effective in local thrombolysis and restoring venous patency, whilst reduing the risks associated with systemic therapy ***(Guan-Hua et al., 2013)***.

CDT in combination with percutaneous mechanical thrombectomy with or without stent placement, has become increasingly important because of its effectiveness in achieving venous patency and in preventing secondary venous insufficiency. Ultrasound – accelerated thrombolysis (UAT) is a novel modality of thrombolytic therapy ***(Reginald et al., 2012)***.