



Endovascular Management of Lower Limb DVT and Its sequelae

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علاج الجلطة الوريدية العميقة و تبعيتها عن طريق

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الملخص العربي

متلازمة ما بعد الجلطة (PTS) هي سبب شائع للألم المزمن، والتورم،
التقرح، والعجز في المرضى الذين يعانون من جلطات الاوردة العميقة (DVT) .

يتم استشارة جراحي الأوعية الدموية على مزيد من المرضى يوميا ، الذين
يعانون من الاصابة بجلطات الاوردة العميقة المزمنة و متلازمة ما بعد الجلطة ، و لهذا
يجب ان تكون استراتيجيات علاجها من قبل فهم متوازن لجوانب الرعاية المختلفة
وخيارات العلاج المتاحة.

هذا استعراض لتقديم لمحة عامة عن النهج متعددة الأوجه لعلاج المرضى
الذين يعانون من جلطات الاوردة العميقة المزمنة و متلازمة ما بعد الجلطة متضمنا
الجوانب الدوائية والفيزيولوجية والعلاج عن طريق الاشعة التداخلية.

متلازمة ما بعد الجلطة هي المضاعفات الأكثر شيوعا ما بعد الجلطة الوريدية
العميقة ، والتي تحدث على الرغم من العلاج المضاد للتجلط في ٢٠٪ - ٤٠٪ من
المرضى في غضون السنوات الأولى بعد الجلطة الوريدية العميقة للطرف السفلي. وقد
تشمل تقرح، ويحدث في ٥٪ - ١٠٪ من المرضى و يؤدي إلى المعاناة والعجز و تكلفة
عالية علي المجتمع.

وقد أظهرت الأبحاث الحديثة أن نوعية الحياة بين المرضى الذين يعانون من
متلازمة ما بعد الجلطة هو الأفقر من بين المرضى في سن مماثلة مع التهاب المفاصل،
وأعراض الرئة المزمنة و مرض السكري، و يحصلون هؤلاء المرضى علي جودة
حياة مماثلة لأشخاص يعانون من الذبحة الصدرية والسرطان و السكتة القلبية.

وقد أثبت العلاج الجوف وعائي عن طريق البالون والدعامات انه يمكن ان
يؤسس التدفق الوريدي في الأوردة الحرقفية ويخفف اعراض متلازمة ما بعد الجلطة
ومضاعفاتها في غالبية المرضى.

Introduction

The post thrombotic syndrome (PTS) is a frequent cause of chronic pain, swelling, ulceration, and disability in patients with lower extremity deep vein thrombosis (DVT).(***Kahn SR et al,2005***)

As vascular surgeons are consulted on more patients with chronic DVT and PTS, their management strategies must be informed by a balanced under-standing of the different facets of chronic DVT care and the available treatment options.(***Kahn SR et al,2008***)

This is a review to provide an overview of the important elements of a multifaceted approach to the management of patients with PTS that includes pharmacological, physiological, and endovascular aspects of care.

The post thrombotic syndrome (PTS) is the most common complication of venous thrombo-embolism (VTE), occurring despite optimal anticoagulant therapy in 20%–40% of patients within the first 1–2 years after deep venous thrombosis (DVT) of the lower limb. Severe PTS, which may include ulceration, occurs in 5%–10% of DVT patients. PTS leads to suffering and disability and is costly to society. (***Caprini JA et al,2003***)(***Bergqvist D et al,1997***)

Recent research has shown that quality of life among patients with PTS is poorer than that among patients of similar age with arthritis, chronic lung disease or diabetes, while patients with severe PTS report quality of life that is comparable to persons with angina, cancer or congestive heart failure.**(Kahn SR et al,2006)**

There are now 4 clinical scoring systems that may be helpful for the diagnosis of PTS. These include Widmer staging, Villalta scale, Ginsberg measure, and Clinical Etiologic Anatomic Pathophysiologic (CEAP) classification. There is no clear advantage of using one of these scales over the others. Both the CEAP and Widmer scales are more general classifications and may be used in evaluating both PTS and chronic venous disease, while the Villalta scale and Ginsberg measure are specific for PTS.**(Villalta S et al,1994)(Ginsberg JS et al,2001)**

The appropriate combination of non invasive to minimally invasive tests should follow in order to confirm or exclude the clinical impression. Duplex scanning is the first test of choice for non invasive evaluation of patients with PTS.**(Porter JM et al,1995)**

MR venography is another invasive test to identify PTS. The test is reliable, it confirms the extent of PTS. Invasive tests are usually not needed to establish the diagnosis of the PTS and can be deferred until intervention is required.

Endovascular treatment of acute and chronic iliac vein occlusions has proven to be safe and effective. Recanalization of chronic occlusions with balloon angioplasty and stenting can re establishes normal venous flow in the iliac veins and relieves symptoms in the majority of treated patients. **(Tilo Kölbel et al, 2008)**

Recanalization and stenting of underlying chronically obstructed iliofemoral segments is becoming the treatment of choice for patients with acute iliofemoral thrombosis, as anticoagulation and compression therapy alone are not satisfactory in preventing PTS. **(Tilo Kölbel et al ,2008)**

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LIST OF ABBREVIATIONS

ACCP	: American College of Chest Physicians
APC	: Activated protein C
AVF	: Arterio-venous Fistula
CDT	: Catheter Directed Thrombolysis
CEAP	: clinical-etiological-anatomical-pathophysiology
CFV	: Common femoral vein
CT	: Computed Tomography
CTPA	: Computed Tomography pulmonary angiography
CTV	: Computed Tomography venography
DVT	: Deep venous thrombosis
ePTF	: expanded poly-tetra-fluoro-ethylene
FDA	: Food and Drug Administration
HRT	: Hormonal Replacement therapy
IBD	: Inflammatory Bowel Disease
ICU	: Intensive Care Unit
IFDVT	: Iliofemoral deep venous thrombosis
IL	: Interleukin
INR	: International Normalized Ratio
IVC	: Inferior vena cava
IVU	: Intravascular Ultrasound
LE	: Lower Extremity
MCP-1	: Monocyte chemoattractant protein-1

MI	: myocardial infarction
MMP	: Matrix Metalloproteinase
MPs	: Microparticles
MRI	: Magnetic Resonance Imaging
MRV	: Magnetic resonance venography
NIVLs	: Non-thrombotic iliac vein obstructive lesions
PAI	: Plasminogen activator inhibitor
PCDT	: Pharmacomechanical Catheter Directed Thrombolysis
PE	: Pulmonary embolism
PMT	: Percutaneous Mechanical Thrombectomy
PTS	: Post-thrombotic syndrome
PTT	: Partial Thromboplastin Time
QOL	: Quality of life
rt-PA	: Recombinant Tissue Plasminogen activator
SLE	: Systemic Lupus Erythematosus
TF	: Tissue Factor
UFH	: Unfractionated Heparin
US	: Ultrasound
VCSS	: venous clinical severity scale
VEINES- QOL/Sym	: veines quality of life/ symptoms
VTE	: Venous thrombo embolism
VWF	: Von willebrand Factor

Aim of the work

To identify different endovascular strategies for the removal of thrombus in the management of acute lower limb DVT; and give a hint about the chronic sequelae of DVT especially The post thrombotic syndrome , and identify the different endovascular intervention modalities in the treatment of PTS and techniques of venous angioplasty and stenting.

Anatomy of Venous System of the **Lower Limb**

Anatomy of venous system of the lower limb and ivc

The venous system of the lower limb is divided into three systems:

1. Superficial system, which lies outside the deep fascia.
2. Deep system, which lies within the deep fascia.
3. Perforating system, which passes through the deep fascia and connects the deep and superficial system. **(Michael, 2002)**

About 10-15% of the venous drainage of the lower limb is carried by the superficial veins while the deep veins carry out the rest. **(Alimi et al.,1994).**

1)The superficial venous system of the lower limb:

The long or great saphenous vein: of greatest concern to the physician treating venous diseases in the lower extremity is the great saphenous vein **(Williams, 2005).**

The long saphenous vein is the longest vein in the body. It is formed by the union of veins from the inner part of the foot and the medial marginal vein and runs upwards for 1 to 1.5 inches in front of the medial malleolus of the tibia **(Decker et al., 1996)**.

It spirals around the medial aspect of the leg and crosses behind the femoral condyle. It continues up the medial aspect of the thigh and empties into the femoral vein at about 4cm below the inguinal ligament **(Kupinski et al., 1993)**.

Terminal tributaries:

Just below the sapheno-femoral junction, the great saphenous vein receives several additional tributaries including the lateral and medial femoral cutaneous veins, the internal pudendal vein, the superficial circumflex iliac vein and the superficial epigastric vein **(Robert et al., 2004)**.

The short or lesser saphenous vein:

Begins at the lateral end of the venous arch on the dorsum of the foot and ascends behind the lateral malleolus, along lateral border of tendo-calcaneus. It extends up the back of the calf, passes between the two heads of the gastrocnemius muscle and empties into the popliteal vein in the popliteal fossa. **(Henry et al., 2004)**.