Post-Thrombotic Syndrome (PTS)

“Conservative Treatment Options”

Dr. S. Kundu
Scarborough Hospital-General Division
Scarbrough Vascular Group
Toronto Endovascular Centre
The Vein Institute of Toronto
Scarbrough Vascular Ultrasound
Scarborough Vascular Institute
Disclosures

Consultant(C) or Research Grant(R) From:
- Bard Canada (C&R)
- Boston Scientific Canada (C)
- Angiodynamics (C&R)
- Cordis (C)
- Cook Canada (C)
- Baylis Canada (C)
- Diomed Inc. (C)
- Dornier Medtech Inc. (C)
What is Post-Thrombotic Syndrome (PTS)?

It is the post-thrombotic sequelae of DVT, that can vary from minor signs to severe manifestations such as chronic pain, intractable edema, and leg ulceration.
**Incidence:**
- PTS develops in at least 1 out of every 3 patients with DVT, within 5 years
- Considerable variability in the literature with a range of 20-100% incidence of PTS

**Established PTS is a significant cause of:**
- Chronic ill health and disability
- Considerable socioeconomic consequences of the patient and health care services
Pathophysiology

What Causes PTS?

- Venous Hypertension
  - Persistent outflow obstruction post DVT
  - Valvular incompetence (deep +/- superficial system)
  - Combination of both

- Abnormal microvasculature or lymphatic function

What are the Consequences of Venous Hypertension?

- Leads to valve incompetence
  - At level of perforators in medial ankle area
  - Leading to edema, hyperpigmentation and possible ulcer formation
Clinical Presentation

PTS is characterized by:
- Aching pain on standing
- Dependent edema
- Lipodermatosclerosis
  - "Brawny, tender induration of the subcutaneous tissues of the medial lower limb"
- Pruritis & eczema
- Secondary superficial varicose veins
- Ulceration
  - Chronic, indolent, high recurrence rate
- Venous claudication
  - Pain in leg during exercise

In patients with a previous history of DVT
Markedly exacerbated by co-existing superficial venous insufficiency
Postthrombotic syndrome

- Postthrombotic pigmentation
- Healed skin ulcer and postthrombotic pigmentation
- Chronic (left) leg swelling, skin hardening, and postthrombotic pigmentation

© Stephan Moll, M.D.
PTS Standardized Scale

Subjective Symptoms
- Heaviness
- Pain
- Cramps
- Pruritis
- Parasthesia

Objective Signs
- Pretibial edema
- Induration of skin
- Hyperpigmentation
- New venous ectasia
- Redness
- Pain during calf compression
- Ulceration of the skin

Each sign or symptom is given a score from 0 to 3

Severe: Ulcer in one occasion or score > 15 measured in two consecutive visits

Mild to moderate: score between 5 and 14 in two consecutive visits

Absent: score < 4
Clinical Diagnosis

- Patient’s with a history of DVT and signs and symptoms compatible with PTS
  - No further investigation required

- Patient’s with non-specific symptoms or clinical picture compatible with PTS, with no history of DVT
  - Further objective confirmation is required:
    - Duplex ultrasound
      - Incompressible common femoral or popliteal vein
      - Popliteal vein reflux
Conservative Treatment Options

- Compression Therapy
- Intermittent Pneumatic Compression
- Medications
- Meticulous Wound Care
Compression Therapy

Comprised of:
- Short stretch bandages
- Adhesive bandages
- Multiple layer bandages
- Compression Stockings
  - Class II: 30-40 mmHg
  - Knee high
Compression Therapy

- Excellent literature on prevention of PTS in patients with DVT using compression therapy
  - Brandijes DPM, Buller HR, Heijober H et al: Lancet 1997

- However, very poor literature on treatment of established PTS using compression therapy
  - Evers EJ, Wuppermann TH: VASA 1999
    - Significant decrease in reflux velocity in PTS using compression therapy
Compression Therapy

Mechanism:
- Reduction of venous blood pressure
  - Decrease venous hypertension
- Reduction in blood volume
- Increased venous outflow
- Reduction in venous diameter
- Improved microcirculation

Suggested protocol:
- Class II: 30-40 mm Hg Knee High
  Compression from morning to night daily
Intermittent Pneumatic Compression (IPC)

- Inflatable synthetic sleeve that fits over the extremity and a pump that intermittently inflates and deflates the sleeve

- IPC units in PTS typically inflated to 50 mm Hg twice daily for 20 to 40 minutes at a time

- Literature is sparse with no level 1 studies


  - Alpagut U, Dayioglu,E: Angiology 2005
    - Reduced wound healing time from 3 months to 20 days
IPC
Intermittent Pneumatic Compression (IPC)

**Mechanism:**
- Collapsing superficial venous system and forcing blood into deep system and proximal
- Increasing subcutaneous pressure, thereby preventing leakage of blood, fibrin, and proteins from skin capillaries
- Enhancement of fibrinolysis
Medications

- **Pentoxifylline**

- **Aspirin**

- **Intravenous Prostaglandin E1**
  - Rudofsky G: Vasa 1999

- **DL-cysteine or DL-Methionine**
  - Salim AS: Clin Exp Dermatol 1992

*Have all shown benefit in significantly improved ulcer healing rate*
Leg Ulcers
A Conservative Approach

- Graduated compression bandaging
  - To be applied by a trained practitioner
- High degree of compression is more effective than a low degree of compression
  - 30-40 or 40-50 mm Hg
- Patients should be referred to physician specializing in leg ulcer care
  - If no improvement after 3 months of treatment
- Assess and manage pain
- Clean ulcer with tap water or saline solution
- Avoid topical antibiotics
Established PTS remains a significant cause of chronic ill health, with considerable socioeconomic consequences for both the patient and health care services.

Conservative treatments including compression therapy, intermittent pneumatic compression and medications remain the mainstays of treatment.
Is it over yet??

I’m hungry !!!
Thank You!

www.theveininstitute.com