Deep vein thrombosis and Post thrombotic syndrome

PTS is a common & important complication following DVT

Venous leg ulcers
Risk factors for PTS

- Thrombus extension into femoral, common femoral, or iliac veins\(^1,^2\)
- Ipsilateral recurrence\(^2\)
- Obesity\(^3\)

---

DVT: Magnitude of the problem

- Annual incidence, 160 per 100,000\(^1\)
- \(~6,500\) presentations of DVT in Australia, 2008\(^2\)

---


Post thrombotic syndrome

- Up to one-half of symptomatic DVTs
  - Severe PTS occurs in 5–10%, and may lead to venous ulceration

- Significant disability and impaired QoL
  - Poorer quality of life than patients with chronic lung disease, diabetes, or arthritis
  - Severe PTS have a QoL comparable to congestive heart failure or cancer

- Substantial healthcare cost

3. Am J Health Syst Pharm 2006; 63(20 Suppl. 6): SS–15

Economic burden of DVT

Table 6 Multivariate linear regression analysis of predictors of log-transformed 2-year deep vein thrombosis (DVT)-related costs

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model 1 Medical costs (n = 328)</th>
<th>Model 2 Medical costs plus PTS during follow-up (n = 308)</th>
<th>Model 3 Total costs (n = 328)</th>
<th>Model 4 Total costs plus PTS during follow-up (n = 308)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (reference &lt; 65 years)</td>
<td>0.84 (0.56–1.24)</td>
<td>0.77 (0.52–1.14)</td>
<td>0.50 (0.33–0.76)**</td>
<td>0.44 (0.29–0.67)**</td>
</tr>
<tr>
<td>Inpatient at baseline</td>
<td>1.84 (1.37–2.47)**</td>
<td>1.79 (1.33–2.40)**</td>
<td>1.75 (1.30–2.35)**</td>
<td>1.68 (1.23–2.36)**</td>
</tr>
<tr>
<td>Provoking feature of DVT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transient (reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>1.20 (0.79–1.81)</td>
<td>1.20 (0.76–1.88)</td>
<td>0.74 (0.48–1.14)</td>
<td>0.84 (0.52–1.34)</td>
</tr>
<tr>
<td>Unprovoked</td>
<td>1.65 (1.28–2.13)**</td>
<td>1.65 (1.28–2.13)**</td>
<td>0.97 (0.74–1.32)</td>
<td>0.97 (0.74–1.32)</td>
</tr>
<tr>
<td>Associated PE</td>
<td>3.32 (2.29–4.82)**</td>
<td>3.16 (2.10–4.35)**</td>
<td>2.46 (1.66–3.64)**</td>
<td>2.29 (1.55–3.39)**</td>
</tr>
<tr>
<td>PTS during follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.23</td>
<td>0.23</td>
<td>0.17</td>
<td>0.17</td>
</tr>
</tbody>
</table>

CI, confidence interval; PE, pulmonary embolism; PTS, post-thrombotic syndrome. *P < 0.05; **P < 0.01. †The other candidate variables entered in the model are described in Materials and methods, and were not found to be predictive of costs. ‡Medical and non-medical.

Cost of therapy = A$10,000/case of VTE

Villalta’s Post Thrombotic Syndrome Scale

Symptoms & Clinical Signs

Symptoms
Pain
Cramps
Heaviness
Parasthesia
Pruritus

Clinical Signs
Pretibial edema
Skin induration
Hyperpigmentation
Redness
Venous ectasia
Pain on calf compression
Venous Ulcer

Mild 5–9, moderate 10–14, severe ≥15 or a venous ulcer is present.


Treatment of established PTS

Lack of data to guide treatment

- Elastic Compression Stockings
  - Benefits venous ulcers

- Mechanical devices
  - E.g., Venowave

- Pharmacologic or surgical treatment

1 O’Meara Cochrane Database Syst Rev 2009
Prevention of PTS

- Adequate therapeutic anticoagulation\(^1,\text{2}\)

- Catheter directed lysis\(^3\)
  - CaVenT trial
  - ATTRACT RCT (recruiting)

- Elastic compression stockings (ECS)\(^4\)


---

MA pooling five RCTs - ECSs reduced the incidence of PTS from 46% to 26% (RR 0.54, 95% CI 0.44–0.67); greatest benefit in severe PTS (RR 0.38, 95% CI 0.22–0.68)\(^1\)

Apply Grade II or III ECS within 2-3 weeks of diagnosis for up to 2 years

\(^1\) Musani Am J Med 2010; 123: 735–40
Stockings & Prevention of PTS

Compression stockings
- Grade II (20-30mmHg)
- Grade III (30-40mmHg)

NOT TEDS

PTS – “real world”*

- None (PTS score 0-4, n=53)
- Mild (PTS score 5-9, n=11)
- Moderate (PTS score 10-14, n=2)
- Severe (PTS score 15+ and/or ulcer, n=15)

VLU was present in 13/14 severe PTS

*VTE registry – Alfred, MMC
Elastic compression stocking is under utilised$^{1,2}$

DVT & use of Compression stockings

- % of patients with lower limb DVT

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>50</td>
</tr>
<tr>
<td>Graduated</td>
<td>25</td>
</tr>
<tr>
<td>Grade 1</td>
<td>15</td>
</tr>
<tr>
<td>Grade 2</td>
<td>10</td>
</tr>
</tbody>
</table>

VTE registry – Alfred, MMC

One-third of clinicians prescribe stockings to prevent PTS$^{1,2}$


Summary

- PTS is common following (proximal) DVT
- Villalta is a validated PTS diagnostic score
- Treatment of established PTS is currently lacking
- Prevention of PTS is critical
  - Anticoagulation, ± CDT AND...
  **ELASTIC COMPRESSION STOCKINGS**