Chronic Iliofemoral DVT

Is there a Role for Clot Removal?

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What does chronic venous thrombus (≥1 year) look like?

A. Pale red – gummy (fibrous thrombus)
B. Redish – white (fibrous thrombus)
C. Maroon – grey (fibrous thrombus)
D. White – grey (fibrosis)

What is clear…
...there is no clot (thrombus)!

Post-thrombotic obstruction is the accurate term!

Fibrosis…not thrombus

Chronic Post-Thrombotic Iliofemoral Venous Obstruction

• Severe morbidity
• High recurrence
Venous Function Assessed During a 5 Year Period after Acute Iliofemoral Venous Thrombosis Treated with Anticoagulation

H. Åkesson, L. Brudin, J. A. Dahlström, B. Eklöf, P. Ohlin and G. Plate

Results

- 95% valvular dysfunction
- 90% had ambulatory venous hypertension
- 70% obstructive iliac vein lesion
- 50% calf muscle pump dysfunction
- 30% developed venous claudication/ulcerations
- Isolated iliac vein thrombosis had better outcome vs. iliofemoral DVT

Treatment of IFDVT

Post-Thrombotic Syndrome

- 40% at 2 years... (all patients)
  Kahn S R et al
  Ann Int Med 2008; 149:698
- Reduced QOL... severe PTS similar to: Angina
  Cancer
  Congestive heart failure
  Kahn S R et al
  J Thromb Haemostasis 2008; 6:1105

- The most powerful predictor of severe post-thrombotic syndrome was IFDVT (HR 2.23)
  ...worse than recurrent ipsilateral DVT (HR 1.78)
  Kahn S R et al
  Ann Int Med 2008; 149:698
**Hemodynamics of Venous Obstruction**

**Arm - Foot Pressure Gradient**

*Post Thrombotic Limbs*

<table>
<thead>
<tr>
<th>Location</th>
<th>Rest</th>
<th>Hyperemic</th>
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</thead>
<tbody>
<tr>
<td>Iliofemoral</td>
<td>6.3 mmHg</td>
<td>8.9 mmHg</td>
</tr>
<tr>
<td>Femoral-popliteal</td>
<td>4.4 mmHg</td>
<td>7.3 mmHg</td>
</tr>
<tr>
<td>Popliteal</td>
<td>1.5 mmHg</td>
<td>3.1 mmHg</td>
</tr>
<tr>
<td>Controls</td>
<td>1.0 mmHg</td>
<td>2.7 mmHg</td>
</tr>
</tbody>
</table>

**Post-Thrombotic Syndrome**

**Anticoagulation Alone**

**Iliofemoral DVT: PTS Underestimated**

**Iliofemoral Venous Disease**

**Case from Tuesday**

- 22yo. woman, referred from outside hospital
- 3X Ohio State Champion
  - 400 meter dash
  - 800 meter run
- Track scholarship to the Ohio State University
- Iliofemoral DVT after BCP in 2007
- Treated with anticoagulation
- Venous claudication/painful left leg
  - Lost scholarship
  - No longer in college

**Chronic Iliofemoral Venous Obstruction**

**Indication**

Chronic post-thrombotic iliofemoral venous obstruction causing severe post-thrombotic syndrome, with *common femoral vein occlusion*
Endovenectomy and Endoluminal Recanalization for Chronic Post-Thrombotic, Iliofemoral Venous Obstruction

A New Treatment Option

Goal

Provide *unobstructed* venous drainage from profunda femoris vein to vena cava

Patients

- N=13; 15 limbs
- Severe, post-thrombotic, iliofemoral/caval venous obstruction (C3-C6)
- Duration of obstruction: 7 mos – 25 yrs (Mean 6.8 years)

PreOp Preparation

1. Phlebography of target leg and IVC
2. Successful guidewire passage through occlusion into patent IVC
3. Chlorhexidine showers BID X 3 days
4. Preoperative platelet inhibition
**Post-Thrombotic Iliofemoral Obstruction**

**Common Femoral Vein Obstruction**

Operative Intervention

**Venous Pressure**
- Cava: 8mmHg
- CFV: 16mmHg

**Post-Thrombotic CFV Lumen**
- 4 Years -

Operative Intervention

**Post-Thrombotic CFV Lumen**
- 4 Years -

Operative Intervention

**CFV - Post Endovenectomy**

**CFV - Patch Venoplasty**

Operative Intervention

**Venous Pressure**
- Cava: 8mmHg
- CFV: 8mmHg
Case

- 67 year old woman – active: walked 6 miles a day
- IFDVT 7 months earlier
- Rx’ed with anticoagulation alone
- Unable to ambulate any distance
- Missing work: painful lower limb
- US, APG, venogram → extensive chronic obstruction

Patient

Symptoms
- Heaviness left leg
- Constant pain left leg
- Venous claudication restricting ambulation

Signs
- Bluish discoloration of left lower leg
- Tense left leg
- Calf painful to compression

Assessment Score

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<th>Assessment</th>
<th>Score</th>
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<tbody>
<tr>
<td>Villalta Score</td>
<td>18</td>
</tr>
<tr>
<td>Venous Clinical Severity Score</td>
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</table>

LEft CFV With Compression
Endovenectomy and Endoluminal Recanalization

- Vena Cava
- Common Iliac Vein
- Internal Iliac Vein
Endovenectomy and Endoluminal Recanalization

– Patch Closure –

Endovenectomy and Endoluminal Recanalization

– AV Fistula –

CFV  PFV
Follow-up: At 3 months postop walking 2 miles...and increasing.

Patient

Assessment | PreOp | 2 Months Post Op |
---|---|---|
Villalta Score | 18 | 3 |
Venous Clinical Severity Score | 12 | 4 |
Strategy of Thrombus Removal

Bilateral iliofemoral and vena caval occlusion

Endovenectomy
Endovenectomy Specimen
- Iliocaval Thrombosis X 9 Years -

Iliocaval Recanalization

- Healed ulcer in 3 mos.
- Swelling controlled
- Pain free
- Significantly increase agility and ambulation
- Lost 30 lbs in 3 mos.
Strategy of Thrombus Removal

After 3 months

Endovenectomy and Endoluminal Recanalization

1 operative mortality
- 52 year old woman, multiple CV risk factors, AMI at home 9 days post op
- 3 evacuation hematoma
- 3 early postop thrombosis
  1 – hematoma under pressure
  1 – residual stenosis, ext iliac vein
  …both lysed and remained patent
  …all had patency restored

Results

Endovenectomy and Endoluminal Recanalization

Results (Continued)

- 2 lost to follow-up
- 7 complete follow-up (mean 1 yr)
  - Villalta scale
  - QOL
  - Duplex

Results

<table>
<thead>
<tr>
<th></th>
<th>Pre Op</th>
<th>Post Op</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Villalta</td>
<td>14</td>
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<tr>
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<tr>
<td>QOL</td>
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<td>-</td>
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Issues Requiring Further Study

1. Risk/benefit of combined platelet inhibition
2. Intensity of postop anticoagulation
3. Risk/benefit of target leg heparin infusion
4. Optimal location of AV fistula
   A. Saphenous – SFA
   B. Caudal CFV – SFA
5. Size of wound drain

Endovenectomy and Endoluminal Recanalization

In patients with chronic, post-thrombotic iliofemoral venous obstruction…
CFV endovenectomy with endoluminal recanalization of the iliac veins:
   – Reduces post-thrombotic morbidity…and
   – Improves quality-of-life

However…it is a procedure in evolution