Exactly what is the Tissue Causing Post-thrombotic Venous Obstruction?

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Post-Thrombotic Syndrome

- Consequence of acute DVT having irreversible changes in the involved vein
- Resulting in a constellation of signs and symptoms…ranging from...
- Mild to incapacitating

Chronic Post Thrombotic Obstruction

Consequences of acute DVT having irreversible changes in the involved vein
Resulting in a constellation of signs and symptoms…ranging from...
Mild to incapacitating

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A histological and functional description of the tissue causing chronic postthrombotic venous obstruction

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Post-Thrombotic Syndrome

Iliofemoral DVT

Anticoagulation Alone

Iliofemoral DVT: Post Spinal Reconstruction

Post Op: Phlegmasia Cerulea Dolens

Iliofemoral DVT: Post Spinal Reconstruction

Femoral Vein Exposure

Iliofemoral DVT

Venous Thrombectomy

Venous Thrombectomy

3 Years Post-Op

- Hairdresser
- Asymptomatic
- No edema
- Normal valve fct.

Chronic, Post-thrombotic Iliofemoral Venous Obstruction

If thrombus remains in vein... it will evolve from...

To...

Resulting in...
Chronic, Post-thrombotic Iliofemoral Venous Obstruction

Patient Presentation
- Chronic non-healing ulcer
- Painful lower leg

Venogram: Popliteal Vein Access

Chronic Iliofemoral Venous Obstruction

Venogram: Popliteal Vein Access

Leading to...

Chronic Iliofemoral Venous Obstruction

Venogram: Popliteal Vein Access

This is not chronic thrombus!

Post-Thrombotic Venous Obstruction

Results

- Intraop Visual Inspection

No evidence of thrombus

Post-Thrombotic Venous Obstruction

Results

- Typical Specimens
  7 months – 25 years

CFV Specimens
- 25 years
- 8 years
- 2 years
- 7 months

Femoral Vein

Results

- Phase 1

- Staining for Ca++ salts demonstrated that cell turnover was occurring (dynamic process) in all specimens
- Tissue was predominantly collagen
  - 80 – 90% Type I
  - 10 – 20% Type III
Post-Thrombotic Venous Obstruction

Immunohistochemistry

- Collagen I and III -
  Collagen I (20x)  Collagen III (20X)

Abundant  Modest

Post-Thrombotic Venous Obstruction

Hematoxylin and Eosin Stain

- Tissue Characteristics -
  Neovascularization
  Chronic Inflammation
  Abundant Collagen

Recanalization and neovascularization... …potentially, a common stimulus!

Observations

1. Post-thrombotic tissue is collagen, predominantly Type I.
2. Older specimens had large recanalization channels
3. Younger specimens appeared to have more neovessels

4. CD31/vWF staining found in all specimens (mature cells)
5. VEGF-R2 found in neovessels and additional cells clustered around the neovessels (appear to be progenitor cells)
6. Experiments of acute DVT in animal models indicate similar pathophysiological processes