Surgical Treatment of Ileofemoral DVT and Plegmasia Cerulea Dolens

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Ileofemoral DVT and Phleghmasia Cerulea Dolens
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• >250,000 new cases of DVT each year.
• >50,000 deaths secondary to PE.
• Anticoagulation is the standard of care for uncomplicated DVT.
  – Up to 80% of patients treated with anticoagulation alone will develop significant post-phlebitic symptoms
• Multiple studies suggest that rapid clearing of the thrombus significantly decreases the incidence and severity of the resultant post-phlebitic syndrome.
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- Reluctance to treat DVT with more aggressive modalities is multi-factorial
  - Anticoagulation and elevation is effective in preventing PE.
  - Swelling will rapidly improve in most cases with conservative management.
  - The adverse consequences of conservative management are not seen for years after the dx.
  - Perception that more aggressive treatment is of no benefit.
  - Cost effectiveness is unknown.
Phlegmasia Cerulea Dolens

Definition

- Edema, cyanosis and pain associated with massive venous thrombosis of the lower extremity.
- May progress to venous gangrene with associated tissue loss.
- Almost always associated with ileofemoral DVT in the lower extremity.
- Accepted indication for venous thrombectomy and thrombolytic therapy.
Phlegmasia Cerulea Dolens
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History

- Fabricius Hildanus first described PCD in 1593
- Heuter 1859 described the pathologic and clinical criteria for the diagnosis of gangrene of venous origin.
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History

• First thrombectomy for PCD was performed by Leriche and Geisendorf in 1939.

• Mahoner 1954 - reported excellent results in 5/6 patients with PCD.
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History

• Haller and Abrams 1963
  – 34 patients with PCD/IFDVT
  – 91% initial success with thrombectomy
  – 26/31 legs available for f/u were normal at an average of 18 mos.
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**History**

- **Lansing and Davis 1968**
  - 17 of Haller and Abrams’ 34 patients studied at 5 years.
  - 15 patients with patent veins.
  - None of the patients with patent veins had competent valves.

- **Karp and Wylie 1966**
  - Reported on 10 patients treated with TE for IFDVT.
  - 8 of the veins were occluded by the time of D/C.
Phlegmasia Cerulea Dolens

Patients

- Brockman and Vasko 1965 - 273 pts with PCD
  - Malignant disease 50
  - Post partum 41
  - Post-operative 38
  - Infection 39
  - Previous DVT 31
  - No known assoc. disease 24
  - Trauma 22
  - Debilitating cardiac disease 13
  - Misc. 14
Phlegmasia Cerulea Dolens

Presentation

- Women outnumber men 4:3
- Age range: newborn to 81
- Unilateral in 239 of 277 patients reviewed by Brockman and Vasko.
  - 115 left, 110 right
- Preceded at the time of diagnosis by phlegmasia alba dolens.
- Associated with shock in 91 patients
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Diagnosis

- Ileofemoral DVT, Phlegmasia Alba Dolens, Plegmasia Cerulea Dolens, and Venous Gangrene present as a continuum of progressively worsening symptoms.
- Massive edema, pain and cyanosis seen with PCD is so striking that the diagnosis can usually be made on clinical exam alone.
- Duplex Ultrasonography will confirm the diagnosis.
- Venography is generally reserved for assessment of the proximal anatomy at the time of endovascular or operative treatment.
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Treatment

- **Elevation and Anticoagulation**
  - Up to 90% of patients with IFDVT develop PTS.
  - 15% will develop stasis ulcers.
  - 44% venous claudication.

- **Thrombolytic Therapy**
  - Many patients will have contra-indication to thrombolytic therapy.
  - Expensive and time consuming.
  - Does not open veins proximal to the access point.

- **Thrombectomy**
  - With or without arteriovenous fistula creation
  - Can treat proximal lesions (May-Thurner) at the same time.
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Surgical Technique

- Vertical Groin Incision
- Expose the CFV, SFV, saphenous vein, and SFJ
- Transverse Venotomy just above the SFJ
- Catheter Thrombectomy of the Iliac System
Phlegmasia Cerulea Dolens
Surgical Technique

- Thrombus in the veins distal to the groin expressed by tightly wrapping the leg from the foot to the thigh with an Esmark elastic bandage.
- Venotomy is then closed.
- Completion venogram
- Endovascular treatment of proximal obstructive lesions.
- AV fistula creation with transected GSV or large proximal branch (approx. 4 mm).
  - Anastomosed end to side to proximal SFA.
  - Optional - wrap with 5 mm PTFE cuff.
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Treatment of May-Thurner Syndrome

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Outcome of Therapy

- Results after anticoagulation and elevation are disappointing.
- Lindner, et al, JVS 1986
  - 47 patients with DVT by phlebography
  - Mean f/u of 7 years
  - 80% symptomatic
  - 83% with valvular incompetence
  - Symptoms and valvular incompetence worse with proximal DVT
Raju and Fredericks, JVS 1986
- 29 limbs in 19 patient 2-13 years after DVT (mean 7 years)
- 2 limbs were normal hemodynamically.
- 9 limbs were obstructed.
  - All nine had severe swelling or ulceration.
- 18 limbs had valvular incompetence only.
  - Reflux was usually confined to one segment.
  - These patients had only mild to moderate symptoms.
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Outcome

• Plate et al, JVS 1984
  – Randomized prospective study of 63 pts with IFDVT
  – 31 anticoagulation, 32 thrombectomy with avf.
  – 7% of the anticoagulation pts vs 42% of the thrombectomy pts symptom free at 6 mos.
  – IF segment open in 35% of the anticoagulation pts vs 76% of the thrombectomy patients.
  – Open femoral veins with competent valves seen in 26% of the anticoagulation patients vs 52% of the thrombectomy patients.
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Outcome of Therapy

• Juhan et al, JVS 25:417-422, 1997
  – 77 thrombectomies in 75 patients
    • All with temporary AVF
    • All anticoagulated for at least 6 mos
  – 65% left sided
    • 62% of these with proximal stenoses (MTS)
  – Mean f/u 8.5 years
  – 12 patients with immediate rethrombosis
    • 8/12 with untreated iliac vein stenoses
    • 4/12 repeat thrombectomy - 2 successful
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Outcome of Therapy

  – Patency 84% at 5 and 13 years
  – Valvular competence 80% and 56% at 5 and 13 years respectively
  – 94% with Grade 0 or I venous insufficiency at 10 years of follow-up
  – 80% of patients with patent ileofemoral venous systems had no valvular incompetence vs 0% of those with ileofemoral obstruction.
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Outcome of Therapy

• Mewissen et al, Radiology 1999;211:39-49
  – Catheter-directed thrombolysis
  – National multicenter registry
  – 303 limbs in 287 patients underwent thrombolysis
  – Ileofemoral DVT in 221 (71%)
  – Urokinase (mean 7.8 million Units) for a mean of 53.4 hours
  – Complete lysis in 31%, 50-99% lysis 52%
  – 1 year patency of 79% with complete lysis and 58% with 50-99% lysis
  – Major bleeding complications in 11%
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Treatment Algorithm

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Conclusions

• DVT is a major world-wide health issue.
• Anticoagulation alone results in significant long term morbidity, particularly in cases of proximal DVT.
• Surgical Thrombectomy results in significantly improved long term outcome in patients with PCD and IFDVT.
• Rapid removal of proximal thrombus with either thrombectomy or thrombolysis should be considered for patients with IFDVT and PCD.
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References

- Karp, RB, Wylie, EJ. Recurrent thrombosis after ileofemoral venous thrombectomy. *Surgical Forum* 1966; 17:147
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References