Should Subclavian Vein Thrombosis Always Be Treated with Rib Resection? How We Decide

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Scope of Problem: Subclavian Vein Occlusion Paget-Schroetter Syndrome or “Effort Thrombosis”

- 2/100,000/year; 3000-6000 cases in US/year
- Mean age early 30’s; M:F =2:1
- 1-4% of all cases of venous thrombosis
- More common on right; 60-80% report vigorous exercise
- Common in athletes, particularly baseball


Normal Anatomy

Compression on Arm Abduction and Rotation
**Spectrum of Clinical Symptoms with Paget Schroetter’s**

- Asymptomatic
- Intermittent arm pain and swelling with activity
- Constant arm swelling/pain
- 85% of patients admit to regular exercise with arm elevation/abduction

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**UCLA Sequence of Rx for Subclavian Vein Thrombosis**

- Brachial approach to subclavian vein; thrombolysis-immediate
- Anticoagulation- days to months
- Repeat duplex ultrasound for patency- days to months
- Transaxillary removal of 1st rib +division of subclavius tendon+ removal of cervical rib in rare cases- days to months
- Repeat venogram with stress if needed- correct the residual stenosis –days to months
  - Balloon angioplasty
  - IJ turndown/endovenorrhaphy
  - Never stent PS due to high risk of restenosis


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**Venous Occlusive Disease and Compression Syndromes**

*Paget-Schroetter Syndrome*
Usually cross with 0.35 hydrophilic wire and Glidecath, but occasionally need a low profile Quick-Cross.

Venous Occlusive Disease and Compression Syndromes: Paget-Schroetter Syndrome


UCLA Surgical Approach

Roos DB. Transaxillary approach for first rib resection to relieve thoracic outlet compression syndrome. Ann Surg 1966
Venous Occlusive Disease and Compression Syndromes: Superior Vena Cava Syndrome
**Results**

- 39 patients presented with symptomatic subclavian vein thrombosis on average 27 weeks post event
- All underwent first rib resection and scalenectomy
  - 25/39 (64%) had residual post rib resection subclavian vein stenosis and underwent angioplasty
  - 13/39 had no residual stenosis and were not dilated (should have had IVUS and been W/U for hypercoagulability)
  - 1 rethrombosed and underwent lysis and dilatation
- 2/3 required PTA and then anticoagulation for 3 months

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**Results (Long-term)**

- 96% patency of the subclavian vein
- No vascular injuries
- No brachial plexus or long thoracic nerve injuries
- 15% pneumothorax - no Rx required

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**“McCleery Syndrome”**

- 11/67 (16%) presented at 57 weeks with swelling but no thrombosis
- All demonstrated vein occlusion with abduction
- All underwent 1st rib resection and scalenectomy
- All became asymptomatic

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**Management of PS with No Compression Visualized by Venogram**

- Imaging
  - Stress venographic views for compression
  - ? IVUS
- Workup for hypercoagulable state (25% will have it)
- No removal of the 1st rib if no compression
- ? Length of anticoagulation

Remaining Questions

• Management of contralateral 1st rib if compression is demonstrated
• Management of asymptomatic patient
• Management of chronic occlusion with symptoms
  – Venous bypass
  – Endovenectomy
  – Stent – never! for P-S TOS but consider for SVC syndrome

How We Decide When Subclavian Vein Thrombosis Should Be Treated with Rib Resection?

• Symptomatic
• Thrombolysis reopens the subclavian vein
• Vein remains patent
• There is compression or fixed stenosis due to the rib