Infraclavicular Approaches To Venous TOS: Technique, Advantages, and Limitations: What Can be Done When the Subclavian Vein Needs To Be Reconstructed Or Cleaned Out

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Primary/Effort Thrombosis of the Subclavian Vein
Venous Thoracic Outlet Syndrome

• Paget, 1875 (London)
• Von-Schroetter, 1884 (Vienna)

PATHOLOGY
1. Acute venous occlusion
2. Chronic extrinsic compression
3. Chronic intrinsic venous stenosis

TREATMENT
1. Acute venous occlusion
   • Anticoagulation
     • High incidence of long-term morbidity b/c most pts highly functional (as high as 70%)
     • Thrombolysis
       • Best chance of success if ≤10-14 days from thrombosis onset
     • Mechanical Thrombectomy
       • If lysis contraindicated or unsuccessful
       • Venous reconstruction/intervention may be necessary

2. Chronic extrinsic compression
   • 1st rib resection
   • Venolysis with
     • anterior scalenectomy
     • excision of subclavius muscle and costoclavicular ligament
Primary/Effort Thrombosis of the Subclavian Vein

**TREATMENT**

3. **Chronic intrinsic venous stenosis or occlusion**
   - Balloon angioplasty
   - Stents
   - Endophlebectomy + patch
   - Bypass

Primary/Effort Thrombosis of the Subclavian Vein

**Balloon Angioplasty**

- Not be performed before bony decompression
- Venous stenoses are composed of large amounts of collagen and elastin and may be resistant to fracture unlike ASO lesions
- Need high pressure balloon--> rupture risk
- Unknown durability in young, active patients
Decompression and Intraoperative Balloon Angioplasty

- Mean F/U 78 days
- Primary patency 91%, Secondary Patency 100%
- ? Durability

Primary/Effort Thrombosis of the Subclavian Vein Stents

- Not be performed before bony decompression
- High failure rate --> mobility of shoulder and SCV
- Unknown durability in young, active patients

Stents for Treatment of Primary Subclavian Vein Thrombosis

- Collapse of a Palmaz stent in the subclavian vein
- Paget-Schroetter Syndrome Therapy: Failure of Intravenous Stents
- 5/14 stents placed AFTER lysis and decompression thrombosed

SURGICAL RECONSTRUCTION
Paget-Schroetter syndrome treated with thrombolytics and immediate surgery

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Introduction: Review of the surgical treatment of the thrombosis of the subclavian vein. This report details 114 patients with axillary-subclavian thrombosis. The treatment consists of immediate thrombolysis followed by surgery at the time of the same event. The surgical procedures included:

- Thrombolysis, 1st rib resection +/- partial sternotomy, patch angioplasty or bypass
- Early surgery (97): 100% patency
- Late surgery (14) (>2 wks): 29% patency
- Mean F/U 5.2 years

17 y/o left handed female

- Competitive basketball player
- Pain, swelling left arm
- TOS with Paget-Schroetter

Patients treated with immediate thrombolysis for proximal upper extremity thrombosis (left arm). TENET Florida Cardiovascular Care.
Conclusions

- Primary/Effort subclavian venous thrombosis should be treated with prompt thrombolysis followed by immediate decompression of the thoracic outlet—same hospital stay
- Infraclavicular Approach provides excellent exposure to SCV and anterior 1st rib and allows easy access for venous reconstruction
- Stents should be avoided
- Durability of balloon angioplasty in young patients is unknown
- The intrinsic vein stenosis is best treated with excision of old thrombus and fibrous bands followed by reconstruction with vein patch or bypass

At 1 year, patient off anticoagulation, received basketball scholarship