Infraclavicular First Rib Resection for Focused and Effective Treatment of Venous Thoracic Outlet Syndrome

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Objective: Thoracic outlet decompression is an effective and durable treatment for venous thoracic outlet syndrome (VTOS), but there is no consensus regarding the optimal operative approach. Transaxillary, supra- or para-clavicular approaches are most commonly employed, based largely upon surgeon preference. However, unlike other forms of thoracic outlet syndrome, the pathology in VTOS is centered in the anteriorly located costoclavicular space. Therefore, we have adopted a focused infraclavicular approach with intraoperative venography that provides excellent access to the axillo-subclavian veins and the costoclavicular space for effective treatment of VTOS patients.

Methods: 32 consecutive patients underwent infraclavicular thoracic outlet decompression between June 2005 and March 2010. All patients presented with symptomatic subclavian vein thrombosis, including 8 (25%) with acute (<14d) and 24 (75%) with sub-acute or chronic (>14d) thrombosis. 28 (88%) underwent catheter-directed thrombolysis pre-operatively, often prior to referral to our institution.

Results: Infraclavicular first rib resection and intraoperative venography was technically successful in all patients. Adjunctive procedures included balloon angioplasty in 19 (59%) and venous stent placement in 1 (3%). 4 patients with chronic vein occlusion or stenosis underwent partial division of the manubrium, vein reconstruction (patch angioplasty in 2 and interposition bypass in 2), and temporary AV fistula creation. 31 (97%) patients had patent veins at discharge.

Conclusions: The infraclavicular approach facilitates focused and effective treatment of patients with VTOS. It provides direct exposure to the costoclavicular space for first rib resection and venolysis, and provides versatility for vein reconstruction if needed. Moreover the infraclavicular approach avoids unnecessary exposure of the brachial plexus and sacrifice of venous collaterals, making it an excellent approach for the treatment of VTOS.