

## Nonoperative Management of Primary Subclavian Vein Thrombosis

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**INTRODUCTION:** The serial application of catheter-directed lysis of clot burden, short-term systemic anticoagulation, and thoracic outlet decompression in patients with primary subclavian vein thrombosis (SVT) is an effective treatment regimen. An optimal result yields amelioration of symptoms, restoration of full arm function, and minimal risk of recurrence. Evolving strategies for achieving these goals currently require operative decompression of the thoracic outlet, primarily via first rib resection, for all patients with a residual filling defect on postlysis venography. However, a large proportion of these patients are asymptomatic and capable of normal arm function without operative intervention and the attendant risks. We have developed a protocol of nonoperative management for asymptomatic patients after prompt thrombolysis, a short course of anticoagulation, and a period of attentive observation. We present our results in 50 patients.

**METHODS:** Fifty patients were diagnosed with primary SVT by careful history and physical examination, duplex ultrasonography (DUS), and contrast venography. Where appropriate, patients underwent chemical thrombolysis with a variety of agents over a period of 12–24 hours. Lysis was suspended when all thrombi had been cleared completely or when there was no change in venographic appearance over 2 successive studies. All patients were discharged home on full anticoagulation and limited activity for 1 month, regardless of final venographic outcome. At follow-up, patients were reassessed for symptoms and subclavian vein patency with DUS. Patients with residual symptoms and/or recurrent thrombosis were offered thoracic outlet decompression with scalenectomy, first rib resection, and venolysis. Asymptomatic patients were encouraged to resume premorbid activity and continue on anticoagulation for another 2 months. At 3 months, patients with minimal to no symptoms, a return to premorbid functional status, and a patent vein had anticoagulation suspended and further treatment limited to follow-up visits.

**RESULTS:** Fifty patients (24 female, 26 male, average age 30 years) were treated for primary SVT over an 8-year period at our institution. Thrombolysis was effective in achieving at least partial patency in 42 patients; it was either not attempted or was unsuccessful in 8 patients. While all 50 were maintained on warfarin as outpatients, 2 (4%) had recurrent thrombosis within 3 months following lysis. Six (12%) patients had warfarin discontinued at 3 months but had recurrent thromboses or recurrence of symptoms with worsening DUS

studies an average of 11.5 months later. All 8 patients with recurrence underwent repeat lysis and/or thoracic outlet decompression, with resolution of symptoms and patent subclavian veins thereafter detected by DUS. Twenty-one (42%) patients had warfarin discontinued after 3 months and were nearly or totally symptom-free with a patent subclavian vein at up to an average of 16 months. All of these patients had undergone successful thrombolysis with near complete or complete resolution of thrombosis. Finally, 21 (42%) patients had persistent symptoms within 3 months on warfarin. All underwent thoracic outlet decompression with resolution of symptoms and suffered no recurrence. Of these, 6 patients were not successfully lysed and had been treated with anticoagulation alone. Only 2 patients whose veins had not been lysed responded to warfarin alone for resolution of symptoms.

**CONCLUSION:** Timely and effective thrombolysis followed by a short period of anticoagulation alone can be an effective treatment algorithm for primary SVT. Patients with conditions not amenable or not responsive to lytic therapy are more likely to require operation for resolution of symptoms and return to function. Although there is a long-term risk of recurrence, it can be retreated successfully, with a good outcome. Further inquiry is necessary to elucidate a risk factor for recurrence.

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