

Below-Knee Stockings Reduce Post-thrombotic Syndrome in Patients with Proximal Deep Vein Thrombosis

Prandoni P, Lensing AW, Prins MH, et al. Below-knee elastic compression stockings to prevent the post-thrombotic syndrome: a randomized, controlled trial. Ann Intern Med 2004;141:249–56.

Study Overview

Objective. To evaluate the effect of compression stockings in preventing post-thrombotic syndrome (PTS) in patients with proximal deep venous thrombosis (DVT).

Design. Single-blind, randomized controlled trial.

Setting and participants. Consecutive patients seen at an Italian center between January 1997 and March 2000 with symptomatic proximal DVT were eligible. Patients were excluded if they had recurrent ipsilateral DVT, evidence of chronic venous disease, low life expectancy, or a contraindication to using the stockings.

Intervention. All patients received unfractionated or low-molecular-weight heparin followed by oral anticoagulation for a minimum of 3 to 6 months. Patients were randomized to usual care or to wear a below-the-knee graded compression stocking that applied 30 to 40 mm Hg of pressure at the ankle. Patients in the intervention group began wearing the stockings approximately 1 week after admission and were advised to wear them during the day or longer for 2 years. Follow-up was performed for up to 5 years.

Main outcome measures. PTS was assessed using a standardized scale based on 5 leg symptoms (pain, cramps, heaviness, pruritus, and paresthesia) and 6 signs (pretibial edema, induration, hyperpigmentation, venous ectasia, and redness or pain during calf compression). All components were scored 0 to 3. A venous ulcer or a score ≥ 15 on 2 consecutive visits at least 3 months apart was considered severe PTS, and a score of 5 to 14 was considered mild PTS.

Main results. Of 268 patients, 81 were excluded. 180 patients ultimately agreed to participate. Six of 90 intervention group patients did not tolerate the stockings. Of the remaining 84 patients, 78 wore the stockings for at least 80% of the day-time hours during the 2-year period. 44 of 90 patients (49%) in the control group and 23 of 90 patients (26%) in the intervention group developed PTS within 2 years (hazard ratio,

0.47 [95% confidence interval, 0.28–0.79]; $P = 0.004$). PTS was severe for 10 controls and 3 intervention patients. 82% of patients who developed PTS had developed symptoms within the first 6 months.

Conclusion. Below-the-knee compression stockings decrease the incidence of PTS following a symptomatic proximal DVT.

Commentary

Chronic venous complications following lower extremity DVT are common [1]. Unfortunately, effective strategies to prevent PTS are not well established. Prior data regarding the efficacy of compression stockings in preventing this complication have been mixed. One study similar to the current study showed beneficial results with the use of graded compression stockings [2]. Another study that enrolled asymptomatic patients no earlier than 1 year after their DVT showed a low incidence of subsequent PTS and no clear benefit from compression stockings [3]. An author of this negative study [3] points out in an editorial accompanying the Prandoni et al article that the benefits they observed could be due to relief of residual acute DVT symptoms in the first 6 months after the DVT and that these symptoms may have resolved without the use of compression stockings [4]. The symptom scores presented by Prandoni et al showing consistently worse symptoms in the control group in both the short and long term speak against this hypothesis. Even though Prandoni et al's analysis does not formally address the question of long-term differences in outcomes, informal examination of symptom scores at 2 and 3 years suggest that the stockings provided significant benefits that are durable.

The major limitation of this study is the lack of blinding. Patients knew which group they were assigned to and there was no sham stocking used. Since self-reported symptoms differed more than objective signs, this lack of blinding may have biased the findings.

Applications for Clinical Practice

Although they are uncomfortable, inconvenient, and costly,

graded compression stockings worn during the day for 2 years following a symptomatic proximal DVT reduce the frequency of post-thrombotic chronic venous complications.

—Review by Stephen D. Persell, MD, MPH

References

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