

Isolated calf vein thrombosis treatment and follow-up

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Duplex scanning has effectively supplanted venography as the initial test of choice in the diagnosis of deep vein thrombosis and in many institutions has eliminated the use of what had long been considered the gold standard- venography¹. Although the vast majority of vascular laboratories utilize duplex scanning to assess for DVT, as opposed to other noninvasive methods such as plethysmography, there is considerable variation in the completeness with which the venous anatomy is evaluated². Many vascular laboratories evaluate only those vein segments extending from the inguinal ligament down to and including the popliteal fossa, the argument being that DVT within these vein segments is of most clinical importance. Additionally, these vein segments are from a technical standpoint relatively easy to evaluate with ultrasound. But what of the calf veins?

What is isolated calf vein thrombosis?

Isolated calf vein thrombosis (CVT) is defined as thrombus below the level of the popliteal vein. The three main paired vessels draining the foot and leg are the anterior tibial, posterior tibial, and peroneal veins. Other important veins of the calf include the soleal and gastrocnemius veins. Research has shown that the calf veins are frequently involved in patients that are symptomatic of a deep vein thrombosis (DVT) and that CVT is the most prevalent form of thrombosis when looking at the distribution over all venous segments³. Isolated CVT is most often identified in the peroneal veins^{3,4,5}. After the peroneal veins, the incidence of CVT was found by Labropoulos et al. to be almost equal in the soleal veins and posterior tibial veins followed closely by the gastrocnemius veins⁴. The reported incidence of isolated CVT in the literature ranges between 3.8% to 34% of patients studied with ultrasound^{4,5,6}. The discrepancies in the literature most likely are attributable to differences in study population, laboratory protocols, and technologist or sonographer skill levels.

What are the risks?

Regardless of the actual incidence of isolated calf DVT, of more significance in determining the need to routinely evaluate the calf veins is the related risk of morbidity and mortality. The risk of pulmonary embolus (PE) associated with isolated CVT remains somewhat controversial^{7,8,9}. Often duplex ultrasound is ordered after the determination of PE and it is no longer possible to determine with certainty the origination of the responsible clot. Pinede et al., in evaluating oral anticoagulant therapy after initial PE, found the rate of emboli recurrence lower for calf thrombosis than for proximal DVT¹⁰. Prospective studies, which followed the

patient's clinical course after documented isolated calf DVT, have reported very few cases of clinically overt PE^{11,12}. The presence of respiratory symptoms (either at the time of diagnosis or later) is clearly an important fact to consider. Passman et al. studied the prevalence of PE in patients with both isolated CVT and respiratory symptoms and found that respiratory symptoms significantly add to the likelihood of PE⁹.

What is the treatment?

Given the controversy surrounding the risk of PE associated with isolated CVT, it is not surprising that a consensus does not exist with regard to treatment. In the past, many suggested "no treatment" as an option vs. oral anticoagulation. More recently with surveillance with duplex ultrasound is being suggested with administration of treatment if and when the thrombus propagates to the popliteal level⁵. With recent research showing such high rates of clot progression, this "no treatment" view is becoming outdated.

Oral anticoagulant therapy is known to be associated with hemorrhagic side effects, multiple drug interactions and interference by dietary Vitamin K. Therefore, the length of treatment should be minimized. The patient's international normalized ratio (INR) should be kept at 2.5 (the desirable range being between 2.0 and 3.0). Literature strongly supports the use of a six-week regimen of secondary oral prophylaxis (Warfarin therapy) after a first episode of CVT in patients without a permanent risk factor^{10,13,14}. The argument for this therapy is the avoidance of clot propagation. Solis et al. found an 8% rate of propagation in patients with CVT who were not treated with anticoagulants¹².

CVT propagation usually occurs within two weeks of the initial diagnosis. Masuda et al. recommend serial duplex studies be done at days three and seven and at the end of the second week. At the end of four weeks a scan can be done to check for clot lysis and reflux⁵. Most CVT lyses within three months. A literature search done by Meissner explains that duplex scans are warranted "in patients with isolated calf vein thrombosis and contraindications to conventional anticoagulation, patients with recurrent symptoms, and to establish a baseline after completion of therapy in patients at risk of recurrence"¹⁵. It can be difficult to differentiate between original and newly developed symptoms in some patients. There hasn't been literature to warrant the use of ultrasound follow-up as an aid in the determination of anticoagulant treatment in the absence of new symptoms.

What can be concluded?

The incidence of isolated calf DVT is not insignificant, and the associated risk of PE is not clearly defined and remains controversial. Additionally, in a significant number of cases, isolated calf DVT will propagate up to and beyond the popliteal vein where it

(Continued on reverse)

calf vein thrombosis

(continued from front)

assumes the same risk of PE as any other major proximal vein DVT. Options include no treatment, oral anticoagulation, and duplex scan surveillance with administration of treatment with demonstrated progression to the popliteal vein.

In any event, before educated decisions regarding isolated calf DVT can be made, it must be diagnosed. Thus, routine evaluation of the calf veins should be considered an integral part of the noninvasive evaluation of the lower extremity veins.

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