

DEEP VEIN THROMBOSIS

Deep vein thrombosis (DVT) carries a 3% 30-day mortality risk compared to 0.4% for a comparison cohort, and as opposed to mortality with PE, it remains constant the last three decades.¹

Diagnosis

It is established by D-dimer test (moderately or highly sensitive), and venous duplex ultrasound with compression maneuvers and color and spectral Doppler evaluation. Loss of compressibility of a venous segment, often with associated Doppler abnormalities, identifies DVT with a high degree of accuracy, and no additional testing is needed to initiate treatment.² Negative whole-leg venous duplex ultrasound has a very high negative predictive value for suspected lower-extremity DVT. A cut-off D-dimer value of 750 µg/L for patients aged 60 years and older has also been proposed for the exclusion of deep vein thrombosis.³ A noninvasive diagnostic algorithm combining the Constans clinical score, D-dimer testing, and ultrasonography has also been recently found effective in excluding upper extremity deep venous and superficial venous thrombosis.⁴ Up to 10% of patients with superficial venous thrombosis have extension of the thrombus to the deep veins, and are at increased risk for PE, myocardial infarction and stroke.⁵ Varicose veins are associated with a 7-folds increased risk of DVT.⁶ Greater height has a causal role in varicose vein development, and the identification of 30 genetic loci in a large-scale genome-wide analysis of varicose veins, indicates a strong genetic correlation between varicose veins and deep vein thrombosis.⁷ IVC anomalies are a rare cause of DVT in the young.⁸

Therapy

The management of distal superficial vein thrombosis, not proximal to the saphenofemoral junction, should be based on risk for thrombus extension, risk for bleeding, and patient preference. In low-risk patients, with isolated calf DVT, LMW heparin has not been found beneficial and anticoagulation may not be needed (CACTUS trial),⁹ and serial ultrasound at 2 weeks to exclude thrombus expansion is recommended by the 2016 ACC guidelines.¹⁰ However, without anticoagulation 10% of patients progress to more extensive thrombosis, and fondaparinux, 2.5 mg od for 45 days, has been found effective in patients with acute, symptomatic superficial-vein thrombosis of the legs (CALISTO trial).¹¹ Thus, a 3-month course of anticoagulation with warfarin or a new oral anticoagulant is probably reasonable in

high risk patients. Dosing of anticoagulants for DVT is the same as for pulmonary embolism. Adjunctive intermittent pneumatic compression is not beneficial in critically ill patients who receive pharmacologic thromboprophylaxis.¹²

The **post-thrombotic syndrome** (hyperpigmentation, edema, or redness) is the main long-term complication of DVT, and only restoration of iliofemoral patency reduces the risk. Catheter-directed thrombolysis refers to the infusion of a thrombolytic drug directly into the thrombus through a multi-sidehole catheter placed under fluoroscopic guidance. The usual protocol entails 20 mg r-tPA over 15 hours (without bolus), with a continuous infusion of r-tPA at a rate of 2 mg/h for the first 5 hours, then reduced to 1 mg/h for the remaining 10 hours, with normal saline coolant at a rate of 35 mL/h, with concomitant administration of UFH or LMWH. Catheter-directed thrombolysis followed by angioplasty and stenting has been considered useful in cases such as extensive iliofemoral/IVC, and SVC thrombosis.¹³

However, its actual benefit is now debatable.¹⁴ In the ATTRACT trial, among patients with acute proximal deep-vein thrombosis, the addition of pharmacomechanical catheter-directed thrombolysis to anticoagulation did not result in a lower risk of the post-thrombotic syndrome but did result in a higher risk of major bleeding.¹⁵ Recanalization of chronically occluded iliac veins with stent placement has been shown to restore blood flow and achieve >90% six-month stent patency with rivaroxaban with or without aspirin.^{16,17} The 2016 ACCP guidelines recommend anticoagulation alone over pharmacomechanical thrombolysis in patients with acute proximal DVT who do not have impending venous gangrene.¹⁰ They, as well as the ASH 2020 guidelines, also recommend not using compression stockings routinely for DVT to prevent post-thrombotic syndrome.^{10,18} The value of compression stockings is controversial,¹⁹⁻²¹ and graduated compression stockings are no longer recommended to treat DVT but may be used when acute or chronic symptoms are present.^{21,22} The AHA 2011 recommendations for the management of iliofemoral deep vein thrombosis are presented in Table 1.²³

Recommendations on pregnancy are provided in Figure 1.²⁴

References

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