Deep Vein Thrombosis (DVT) Management

Deep vein thrombosis (DVT) is a venous thromboembolism (VTE) that is often asymptomatic with clinical signs that are nebulous, including a combination of swelling, pain and warmth. Diagnostic tests then become of utmost importance in determining proper course of action. Diagnosis can be supported or accomplished via a variety of studies, including compression ultrasound (CUS) with doppler, D-dimer and contrast venography. Treatment is dependent on a variety of factors, but options include heavy-hitting therapies such as an inferior vena cava (IVC) filter, heparin, warfarin and thrombectomy/thrombolysis in addition to less aggressive, preventative measures such as compression stockings and walking.



PLAY PICMONIC

Diagnosis

Compression Ultrasound (CUS) with Doppler

Doppler-weatherman using Ultrasound

This type of ultrasound is the preferred study for DVT and utilizes the doppler effect to assess whether blood is moving towards or away from the probe, and its relative velocity. By calculating the frequency shift of a particular sample volume, for example, flow in an artery or a jet of blood flow over a heart valve, its speed and direction can be determined and subsequently, obstruction can be identified.

D-Dimer

Detective-Dime

D-dimer is a small protein found in blood that is the product of clot degradation following fibrinolysis. Elevations result when plasmin, the enzymatic cleaver of blood clots, erodes a thrombus into smaller and smaller particles eventually resulting in tiny polymers called fibrin degradation products (FDPs), which include D-dimer. This test can demonstrate rapid results and high sensitivity, but has poor specificity as a variety of pathological and physiological conditions can cause elevations. As such, D-dimer is employed when patients present with suspicion of DVT or other thrombosis since a negative value can exclude a DVT diagnosis. However, since a positive result is not diagnostic of DVT, it is most commonly used in conjunction with the other studies included here.

Contrast Venography

Contrasting-con Vine-graph

Formerly the gold standard for DVT imaging, contrast venography involves injecting a contrast agent into a peripheral vein of the affected limb (often a dorsal foot vein since this outlines all of the deep venous vasculature of the lower extremity), followed by imaging studies to reveal whether the venous blood supply has been obstructed. However, this is a technically difficult study with adverse outcomes related to IV contrast-induced allergic reactions and renal insufficiency in addition to observer inconsistency.

Treatment

IVC Filter

Vine-Cave Filter

IVC filters are not used extensively due to complications regarding their implantation and retrieval as well as their poor efficacy in some cohort studies. Nonetheless, they are indicated for certain patient populations such as those with acute, proximal or recurrent embolisms who also have contraindications to anticoagulation and those with little cardiopulmonary reserve in which an embolic event would be catastrophic to survival.

Heparin for Acute Management

Hippie-heron with Acute-angle

Patients in whom an acute DVT has been established should be given IV unfractionated heparin or subcutaneous low molecular weight heparin (LMWH; enoxaparin/Lovenox). Additionally, prophylactic administration is indicated for patients who are recovering from surgery, with orthopedic and abdominal surgery being the major culprits leading to DVT, as well as immobile, bedridden patients that do not have a contraindication.

Sign up for FREE at picmonic.com

Warfarin for Long-term Management

War-fairy with Long treatment

Following administration of one of the forms of heparin, patients should also receive long-term therapy with warfarin (Coumadin; Jantoven) for 3-6 months, depending on provoked or unprovoked thrombosis, bleeding risk and patient tolerance. A variety of alternative therapies may also be used for extended VTE anticoagulation including direct (rivaroxaban/Xarelto; apixaban/Eliquis; edoxaban/Savaysa) and indirect (fondaparinux/Arixtra) factor Xa inhibitors and thrombin inhibitors (dabigatran/Pradaxa).

Thrombectomy/Thrombolysis

Trombone-scalpel and Trombone-lyso-can

Thrombolysis involves the systemic lysing or breaking up of a blood clot, while thrombectomy is removal of the clot via surgery or catheter-device. Neither of these therapies are used commonly owing to their substantial procedural risk and unchanged recurrence and mortality rates in VTE despite their use. These are usually reserved for patients who have failed anticoagulation, or those with massive thrombosis such as phlegmasia cerulea dolens (“painful blue edema”; a rare condition related to an oversized DVT with extensive obstruction and associated venous outflow impedance and edema sufficient to also cause arterial inflow restriction, potentially resulting in gangrene) or a large iliofemoral DVT.

Stockings

Stockings

Studies regarding the use of stockings to prevent post-thrombotic syndrome (PTS) and DVT recurrence are inconsistent and contradictory. Additionally, patient compliance must be factored in when choosing to incorporate this therapy since many find these stockings inconvenient, costly, uncomfortable and require assistance to apply. However, some evidence suggests that these stockings reduce the risk of long-term complications related to DVT.

Walking

Walker

Previously, there was concern whether patients with acute DVT should ambulate early in the treatment course given the potential for embolization. However, studies have not demonstrated an increased risk of either recurrence or fatal pulmonary embolisms. As such, ambulation is recommended as early as possible. Those with pain and swelling may also use the compression stockings mentioned above to assist in achieving ambulation.

Sign up for FREE at picmonic.com