



GRAND TRAVERSE
RADIOLOGISTS

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INTERVENTIONAL RADIOLOGY UPDATE

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Additional Therapies for DVT

Venous thromboembolic (VTE) disease is a major cause of morbidity and mortality in the United States. It is the third most common cardiovascular illness after acute coronary syndrome and stroke.



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The exact incidence of VTE disease is unknown but predicted to be 1,000,000 cases per year in the US. Many cases are recurrent and 2/3 involves hospitalized patients. Nearly 300,000 deaths occur each year. Deep venous thrombosis (DVT) not only contributes to pulmonary embolism, the most fatal complication, but also to post phlebitic syndrome (PPS). PPS occurs in up

to 30% of patients 8 years following diagnosis of their initial acute thrombotic episode with signs and symptoms occurring as early as two years. One study placed the risk of PPS after 1, 2 and 5 years at 17%, 23% and 28%, respectively. Of the patients with PPS, up to 25% will develop chronic venous stasis ulcers. PPS seems to occur in patients with more extensive DVT in the proximal veins and is more frequent in obesity or with recurrent disease in the previously affected limb. Older patients, patients with incompletely treated DVT or those with persistent pain and swelling one month after therapy are at increased risk. Post phlebitic syndrome occurs from valve damage related to the development of thrombus and the resultant inflammation. This leads to valve incompetence and insufficiency. There can also be chronic venous occlusions due to non-recanalization. This leads to venous hypertension.

The risk factors for deep venous thrombosis include hereditary and acquired conditions. These are beyond the scope of this newsletter and can be found in many sources. The basic teaching for the cause is Virchow's triad of stasis, hypercoagulability and injury to the veins of the upper as well as the lower extremities.

Deep Venous Thrombosis

Typical symptoms of DVT in the upper and lower extremities include pain or tenderness and swelling. Signs on physical examination include increased warmth, edema, and erythema and the presence of dilated veins (collaterals) on the body wall or limb. A life and limb-threatening manifestation of DVT, phlegmasia cerulea dolens, occurs most often in the setting of malignancy, heparin-induced thrombocytopenia (HIT), or other thrombophilic conditions in which the thrombus completely occludes venous outflow, causing massive limb swelling, hypertension in the capillary bed, and eventually ischemia and gangrene if untreated. Phlegmasia cerulea dolens is a vascular emergency requiring anticoagulation and if possible thrombolysis or surgical versus catheter-based thrombectomy. Fasciotomy may also be required to relieve associated compartment syndromes.

Deep Venous Thrombosis of the Upper Extremity

Upper extremity DVT is most often related to central venous catheter placement, transvenous intracardiac devices, or intravenous drug abuse. Other, less common causes include thoracic outlet syndrome (also referred to as "effort thrombosis") and hypercoagulable conditions including malignancy. Patients may be asymptomatic, but more often they complain of arm swelling and pain. Anticoagulation is indicated if there are no contraindications. Thrombolysis should be considered in younger patients with a low risk of bleeding and symptoms of acute onset.

Treatment

Once DVT is suspected, anticoagulation should be started immediately unless there is a contraindication. The main goals of treatment for DVT include prevention of pulmonary embolism, post phlebotic syndrome, and recurrent thrombosis.

Anticoagulation

Anticoagulation remains the treatment for thromboembolic disease. Initial therapy may include heparin (UFH), low-molecular-weight heparin (LMWH), or fondaparinux (Arixtra) followed by an oral anticoagulant such as a vitamin K antagonist (VKA). Once anticoagulation with UFH, LMWH, or fondaparinux is begun, a VKA may be initiated. An overlap should be continued for a minimum of 5 days or until the international normalized ratio (INR) is within the target range of 2.0 to 3.0 for 24 hours to permit adequate depletion of vitamin K-dependent coagulation factors.

Thrombolytic Therapy

Thrombolytic therapy for acute DVT, symptoms of less than 14 days, may be beneficial in select patients, and although it can be administered systemically, local infusion under catheter guidance is preferred. Both routes carry an increased risk of hemorrhage compared to standard anticoagulation. Although it has been suggested that use of thrombolytics promotes early recanalization and minimizes the incidence of the PPS, their role in the treatment of DVT without a threatened limb is still unclear. The current ACCP guidelines suggest that in selected patients with extensive central DVT (iliofemoral) less than 14 days duration who are at low risk of bleeding and who otherwise have good functional status and life expectancy of 1 year, catheter-directed thrombolysis may be considered if the expertise and resources are available. New endovascular techniques are available include EKOS which is a catheter delivery of thrombolytic into the thrombus with ultrasound to improve lysis and decrease treatment time and therefore the risk of bleeding associated with thrombolysis. There are Trellis Catheters and AngioJet catheters which combine mechanical and pharmacological thrombolysis to allow shorter treatment time and decreased lytic dose to decrease risks.

The Interventional Radiologists of Grand Traverse Radiologists, PC at Munson Medical Center have the expertise in thrombolytic therapy that is necessary to treat patients with VTE and DVT. Patients with acute central upper and lower extremity DVT are the best candidates for catheter based techniques. The goal in these patients is to try to prevent PPS. After the syndrome occurs, treatments for PPS are limited and not always very successful at alleviating the symptoms. ASA among other anti-inflammatories, diuretics and exercise can help control symptoms. Additional treatments for PPS include knee high compression stockings 30-40 mmHg which can reduce the occurrence by 50% after two years.

Clinic and Resources

For more information, please contact the Interventional Radiology Clinic at 231-935-2861. Questions or referrals can also be directed to any of the Interventional Radiologists by paging us through the Munson operator. We continue to offer around-the-clock coverage for inpatients and emergencies and are available 365 days a year. We look forward to working with you and your patients.



Interventional Vascular Radiology Team

From left to right: Michelle Lung, M.D., Frederick Brodeur, M.D., James Picotte, M.D., Daniel Dall'Olmo, M.D.

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