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Managing Venous Thromboembolic Disease On-Call

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Managing venous thromboembolic disease on-call requires the interventional radiologist consider not only potential risk and benefit to the patient but also available resources in the IR suite as well as throughout the hospital, such as intensive care monitoring during treatment. We demonstrate how our practice manages these on-call cases ranging from deep venous thrombosis to acute pulmonary embolism and decide which patients need emergent treatment and which can undergo delayed intervention during working hours. In all cases, an adequate preprocedural clinical assessment is crucial.
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Introduction

Venous thromboembolic disease is usually presented to the interventional radiologist in one of two clinical settings: venous thrombosis (or occlusion) or embolization of part or all of the bulk thrombus. Treatment decisions for the interventional radiologist revolve around benefit to the patient (hopefully guided by outcomes-based evidence), risk stratification (both in procedural risk, as well as potential risk of not intervening), acuity of presentation and illness, and available resources. In the on-call setting, with potentially fewer available resources, the interventional radiologist must be able to manage and balance the remaining factors to determine what, if any, intervention is required, and whether, in some cases, deferment until daytime hours is better, perhaps for the patient, or at least for the local medical delivery system.

Interventional radiology practices have varying levels of expertise and resources available to treat venous thromboembolic disease during daytime hours, and there exists much debate about how, or even whether, to treat various presentations of venous thromboembolic disease. This article is not meant to engage in that debate, but will rather share how our particular practice manages venous thromboembolic disease during off-hours, and what guides our decision-making process.

Deep Venous Thrombosis

Although most presentations of deep venous thrombosis (DVT) are not inherently life-threatening, thrombus may embolize to the pulmonary circulation and therein become potentially life-threatening. For these cases, on-call management is focused on risk mitigation, and not symptomatic relief from swelling, which can be handled during daytime hours. However, the special cases of DVT involving the renal vein outflows (ie, renal vein thrombosis), and phlegmasia, a precursor to venous gangrene, require emergent intervention. The differentiation between phlegmasia alba dolens and phlegmasia cerulea dolens is not necessary for the initiation of immediate treatment.

Clinical Evaluation

In the case of DVT, documentation of the thrombus and its extent is likely to have been completed prior to a referrer contacting interventional radiology; however, this should be reviewed upon consultation. With any

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procedure requiring the use of intravenous contrast material, we require a current serum creatinine to determine the appropriate contrast agent, and with ionizing radiation, a urine pregnancy test for females of childbearing age. Cross-sectional abdominal imaging of any age should be reviewed to determine the patient's caval anatomy, and recent abdominal imaging should also be reviewed to determine the absence of existing filter prior to placement.

An imaging study (such as CT or US) showing renal vein obstruction with concurrent elevation of serum creatinine should be evaluated in the patient referred for treatment of renal vein thrombosis. Furthermore, when considering thrombolysis, we query the patient for contraindications, specifically recent abdominal surgery or intracranial hemorrhage, pregnancy, active or recent gastrointestinal bleeding, or intracranial neoplasm, the latter of which may require cross-sectional imaging of the head to exclude in patients with known or suspected malignancy.

Finally, examination of the patient's affected limb is critical in the diagnosis of phlegmasia, where the limb will be pale or bluish and acutely pulseless (or with diminished or weak arterial pulses by Doppler examination). In the case of suspected phlegmasia, we routinely consult our vascular surgery colleagues, and formulate a plan in concert. Figure 1 is a recent case of phlegmasia from our institution.

Figure 1 (A) A 55-year-old man with no significant past medical history who presented to the emergency room with acute-onset extreme right leg pain and discoloration. On physical examination, distal pulses were very faint via Doppler. (B) On initial venography from the right popliteal vein, thrombus was extended to the right common iliac vein. (C) After rheolytic thrombectomy and maceration with a rotational thrombectomy device, reduction of thrombus burden in the right superficial femoral vein was seen. (D) After overnight infusion catheter-directed thrombolysis, the patient's pain has significantly decreased, and the swelling has decreased. Pulses are now 2+ palpable, but there persists some discoloration. (E) Significant clearance of thrombus after overnight thrombolysis in the right superficial femoral vein. (Color version of figure is available online.)