

EDITORIAL COMMENT

Wait—The Inferior Vena Cava Is Thrombosed? Now What?*



Michael R. Jaff, DO

Funny how trends happen in medicine. Think about it in the context of the little slice of the world in which I practice: vascular medicine. First, we couldn't get anyone to pay attention to patients with peripheral artery disease (PAD) (1). Then, we couldn't even get physicians to prescribe effective antiatherosclerotic medical therapies for patients with PAD (2). Everyone has been concentrating on exciting, novel, and "sexy" endovascular technologies for the minimally invasive treatment of PAD (3,4). I certainly understand and appreciate the significant advances in the medical management of acute venous thromboembolism (5), but until recently, only a small percentage of practitioners were interested in advanced management therapies for deep venous thrombosis (DVT) (6). In fact, experts suggest that advanced therapies for DVT are useful in only a limited number of patients (7). This may be the case, or it may be that the question of intervention for DVT has not yet been adequately studied. It is hoped that the ATTRACT (Acute Venous Thrombosis: Thrombus Removal With Adjunctive Catheter-Directed Thrombolysis) trial will add to our knowledge base (8).

However, even before we consider additional data, we must recognize that all venous thromboembolisms are not alike. For example, we appreciate that proximal DVT carries greater risk for pulmonary embolus

than isolated calf vein thrombosis (9). However, it is rare that inferior vena cava (IVC) thrombosis is ever mentioned in discussions about DVT management. This is likely due to the impression that IVC thrombosis is very unusual and that the diagnosis of IVC thrombosis is difficult. In a recent review of the performance, interpretation, and nuances of venous duplex ultrasonography to diagnose DVT, there was no mention of strategies to diagnose IVC thrombosis specifically (10). Counting on the physical examination to reliably yield a diagnosis is fraught with error, as the most common symptoms of IVC thrombosis are likely limb edema, discomfort, and venous varicosities, all common and nonspecific findings. Of note, the pattern of venous collateral vessels may raise the suspicion for IVC thrombosis, particularly if the collateral vessels are on the abdominal wall, flank, and bilateral inguinal regions. In the most severe of cases, either acute pulmonary embolus or impending venous gangrene, both mandating investigation and initiation of rapid therapy also place both the patient and the providers in an emergent situation, one we would all like to avoid by fostering a more timely diagnosis.

SEE PAGE 629

In this issue of *JACC: Cardiovascular Interventions*, Alkhouli et al. (11) provide a comprehensive assessment of this underappreciated condition. They provide a thorough review of the etiologies, methods of diagnosis, and options for treatment of IVC thrombosis. Of tremendous importance is their recognition that the most common cause of this challenging disorder is thrombosis of previously deployed IVC filters. With the rapid expansion in placement of IVC filters, particularly in the United States, we can expect this problem to actually increase (12).

Interestingly, the investigators suggest that primary treatment for acute IVC thrombosis is systemic

*Editorials published in *JACC: Cardiovascular Interventions* reflect the views of the authors and do not necessarily represent the views of *JACC: Cardiovascular Interventions* or the American College of Cardiology.

From Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts. Dr. Jaff is a noncompensated adviser to Abbott Vascular, Boston Scientific, Cordis Corporation, and Medtronic Vascular; is a compensated consultant to Cardinal Health and Volcano; is a member of the Data Safety and Monitoring Board for Bio2/Novella; holds equity in Embolitech and Valiant Medical; and is a board member with VIVA Physicians, a 501(c)(3) not-for-profit education and research organization, the Society for Cardiovascular Angiography and Intervention, and the Intersocietal Accreditation Commission.

anticoagulation with parenteral unfractionated heparin or, in patients who are not candidates for more aggressive thrombolytic therapy, low-molecular weight heparins with bridging to warfarin. Despite the lack of clinical data, one wonders, in the case of patients who are managed medically, or who have completed thrombus-resolving intervention, if a tissue-specific oral anticoagulant agent might be a reasonable alternative (i.e., rivaroxaban, apixaban, dabigatran, and edoxaban).

More important, the investigators chose to provide an extensive description of minimally invasive, catheter-based interventions for acute and subacute IVC thrombosis. Although these procedures offer the potential for thrombus resolution, acute alleviation of symptoms, and reduction in the long-term risk for chronic venous insufficiency, there is no published research to guide us as to when to attempt these procedures. Alkhouli et al. (11) suggest that if a patient presents with an acute IVC thrombosis and has an acceptably low bleeding risk, these procedures should be attempted. This seems like a pragmatic recommendation, but I would proceed with caution given the dearth of research supporting this practice. It may be that rapid initiation of effective anticoagulation will offer similar short- and long-term benefits without the associated risks and costs of intervention.

Finally, the use of endovenous stents for venous disease is quite controversial, as most published research has represented perspectives based on limited, single-center experiences. A recent meta-analysis suggested that stents may be safely and effectively deployed (13). However, in that analysis, stents were analyzed in the iliofemoral venous segments, and no mention of IVC stents for thrombosis was made.

Alkhouli et al. (11) should be congratulated on bringing this clinical syndrome to light. However, their study highlights the limited scientific data we have to guide us in the management of this disorder. As in many situations in vascular medicine, having a team of specialists from medical, surgical, and endovascular perspectives will undoubtedly offer these challenging patients the best outcomes. However, prevention is an ounce of cure—because IVC filter thrombosis is the main etiology for IVC thrombosis, think once more before placing the filter—does the patient really need it? If so, pull it out as soon as is safe and reasonable.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Michael R. Jaff, Massachusetts General Hospital, Harvard Medical School, 55 Fruit Street, Warren 905, Boston, Massachusetts 02114. E-mail: mjaff@partners.org.

REFERENCES

1. Hirsch AT, Murphy TP, Lovell MB, et al. Peripheral Arterial Disease Coalition: gaps in public knowledge of peripheral arterial disease: the first national PAD public awareness survey. *Circulation* 2007;116:2086-94.
2. Bonaca MP, Creager MA. Pharmacological treatment and current management of peripheral artery disease. *Circ Res* 2015;116:1579-98.
3. Dake MD, Ansel GM, Jaff MR, et al. Paclitaxel-eluting stents show superiority to balloon angioplasty and bare metal stents in femoropopliteal disease: 12-month Zilver PTX randomized study results. *Circ Cardiovasc Intervent* 2011;4:495-504.
4. Tepe G, Laird J, Schneider P, et al. Drug coated balloon versus standard percutaneous transluminal angioplasty for the treatment of superficial femoral and/or popliteal peripheral artery disease: 12-month results from the IN.PACT SFA randomized trial. *Circulation* 2015;131:495-502.
5. The EINSTEIN-PE Investigators. Oral rivaroxaban for the treatment of symptomatic pulmonary embolism. *N Engl J Med* 2012;366:1287-97.
6. Konstantinides S, Torbicki A. Management of venous thrombo-embolism: an update. *Eur Heart J* 2014;35:2855-63.
7. Wells PS, Forgie MA, Rodger MA. Treatment of venous thromboembolism. *JAMA* 2014;311:717-28.
8. Vedantham S, Goldhaber SZ, Kahn SR, et al. Rationale and design of the ATTRACT study: a multicenter randomized trial to evaluate pharmacomechanical catheter-directed thrombolysis for the prevention of post-thrombotic syndrome in patients with proximal deep vein thrombosis. *Am Heart J* 2013;165:523-30.
9. Masuda EM, Kistner RL, Musikasinthorn C, Liquido F, Gerling O, He Q. The controversy of managing calf vein thrombosis. *J Vasc Surg* 2012;55:550-61.
10. Gornik HL, Sharma AM. Duplex ultrasound in the diagnosis of lower-extremity deep venous thrombosis. *Circulation* 2014;129:917-21.
11. Alkhouli M, Morad M, Narins CR, Raza F, Bashir R. Inferior vena cava thrombosis. *J Am Coll Cardiol Intv* 2016;9:629-43.
12. Weinberg I, Kaufman J, Jaff MR. Inferior vena cava filters. *J Am Coll Cardiol Intv* 2013;6:539-47.
13. Razavi MK, Jaff MR, Miller LE. Safety and effectiveness of stent placement for iliofemoral venous outflow obstruction: systematic review and meta-analysis. *Circ Cardiovasc Interv* 2015;8:e002772.

KEY WORDS inferior vena cava filters, stent(s), thrombolytic therapy, vena cava thrombosis