

A novel duplex finding of superficial epigastric vein flow reversal to diagnose ilio caval occlusion



Raghu Kolluri, MD, RVT, Brian Fowler, BS, RVT, Gary Ansel, MD, and Mitchell Silver, DO, Columbus, Ohio

ABSTRACT

Objective: Although duplex ultrasound (DUS) imaging is the current gold standard in the diagnosis of femoropopliteal deep venous thrombosis, it is not an optimal diagnostic modality to diagnose ilio caval occlusion. Screening for ilio caval occlusion thus remains a challenge for clinicians because of the lack of a reliable noninvasive technique. This challenge results in most patients undergoing computed tomography venography or magnetic resonance venography or invasive venography and intravascular ultrasound imaging. This study reports a novel, yet simple, reproducible and intuitive, surface DUS finding of physiologic flow reversal within the superficial epigastric vein (SEV) as a sign of proximal ilio caval occlusion (ICO).

Methods: This was a retrospective study of 15 patients who were diagnosed with ICO based on the finding of SEV flow reversal on DUS imaging. Patient demographics, presenting CEAP C scores, ICO characteristics, correlation with advanced imaging, and short-term follow-up findings are reported.

Results: Physiologic reversal of the SEV resulted in confirmation of ICO in all patients who underwent advanced imaging, including computed tomography venography or traditional venogram along with intravascular ultrasound imaging. All patients who underwent follow-up DUS scans demonstrated normalization of the SEV flow after ICO recanalization.

Conclusions: ICO can result in deep venous thrombosis, post-thrombotic syndrome, and chronic venous insufficiency. Physiologic flow reversal in SEV is diagnostic of ICO. To the best of our knowledge, this is the first report of this novel DUS finding. (J Vasc Surg: Venous and Lym Dis 2017;5:358-62.)

In 1957, May and Thurner¹ reported compression of the left iliac vein against the fifth lumbar vertebra. This is also frequently referred to as iliac vein compression syndrome (IVCS) and is believed to increase the risk of ipsilateral iliofemoral deep vein thrombosis and venous hypertension and can also lead to severe chronic venous insufficiency symptoms and venous ulceration.² However, a 50% stenosis or obstruction of the left iliac vein is also reported in 24% of asymptomatic patients.³ Screening for IVCS is challenging and can potentially result in both overdiagnosis and underdiagnosis of this condition.

The Society for Vascular Surgery and the American Venous Forum guidelines recommend (Grade 1B level) using computed tomography venography, magnetic resonance venography, ascending and descending contrast venography, and intravascular ultrasound (IVUS) imaging in patients with severe forms of chronic venous insufficiency to assess for IVCS.⁴ Noninvasive duplex ultrasound (DUS) imaging is not recommended for diagnosis or follow-up of IVCS according to these guidelines.

Chronic ilio caval occlusion (ICO) can potentially result in venous collateral pathways within the abdomen and pelvis. Venography-based studies have previously described these collateral patterns.^{5,6} Kayılioğlu et al⁷ recently recommended using DUS findings in the lower extremity to screen for proximal obstruction or occlusion. A combination of monophasic common femoral vein flow at rest and continuous flow during the Valsalva maneuver was demonstrated to be a reliable diagnostic tool to diagnose high-grade iliac vein obstructions.

In the series presented here, we report another novel DUS finding of flow reversal within the superficial epigastric vein (SEV) as a reliable predictor of proximal ICO. The saphenofemoral junction is the confluence of a number of superficial veins, including the great saphenous vein, accessory saphenous veins, and the veins of the abdominal wall and the pudendal region. The SEV, superficial external pudendal, and superficial circumflex iliac vein are some of the larger nonsaphenous veins draining into the saphenofemoral junction. Of all these veins, the SEV is most clearly visible on DUS imaging (except in patients with morbid obesity and large pannus) and can be located at the level of the inguinal ligament.⁸ Normal physiologic flow within the SEV is from cephalad to caudad (Fig 1), which is opposite to the direction of flow within the great saphenous vein and the deep venous system.

This is a first report of 15 consecutive patients who were diagnosed with ICO based on reversal of this normal flow pattern. This simple, noninvasive DUS finding, which could be used to screen for ICO, is the first report in the English language literature to our knowledge.

From the OhioHealth Vascular Institute, OhioHealth Research & Innovation Institute.

Author conflict of interest: none.

Correspondence: Raghu Kolluri, MD, RVT, OhioHealth Vascular Institute, OhioHealth Research & Innovation Institute, 3705 Olentangy River Rd, Columbus, OH 43214 (e-mail: raghu.kolluri@ohiohealth.com).

The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2213-333X

Copyright © 2017 by the Society for Vascular Surgery. Published by Elsevier Inc. <http://dx.doi.org/10.1016/j.jvsv.2017.01.017>

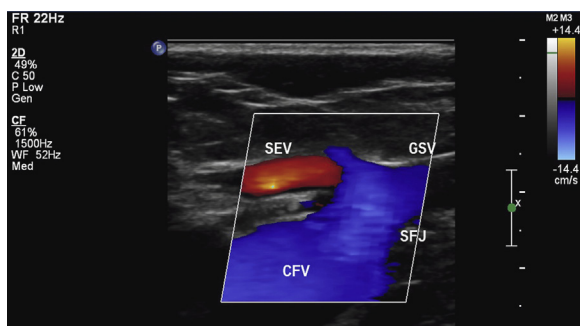


Fig 1. Normal cephalad-to-caudad flow in the superficial epigastric vein (SEV), opposite to the common femoral vein (CFV) flow. GSV, Great saphenous vein; SFJ, sapheno-femoral junction.

METHODS

Our Institutional Review Board approved this small retrospective study, and the principles outlined in the Declaration of Helsinki were followed. Patient consent for this research was not obtained because this was a retrospective study.

During an 18-month period (October 2014 to April 2016), reversal of physiologic flow was noted within the SEV in 15 consecutive patients (9 men and 6 women), aged between 42 and 80 years, who presented with severe chronic venous insufficiency symptoms to our outpatient vascular clinic.

Venous DUS protocol. Routine venous DUS imaging (venous incompetence or reflux study), in our institution, is performed only by sonographers with the Registered Vascular Technologist (RVT) credentials. Our DUS protocol includes specific evaluation of the direction of flow within the SEV, in patients presenting with severe chronic venous insufficiency symptoms (CEAP class C₄-C₆). The DUS device (Philips EPIQ/ IU22/ IU33; Philips Medical Systems, Bothell, Wash) and a 9-3-MHz linear array transducer were used for these studies. The venous incompetence duplex studies were done according to our previously published protocol with the patient standing.⁹ The SEV examinations were performed with the patient supine.

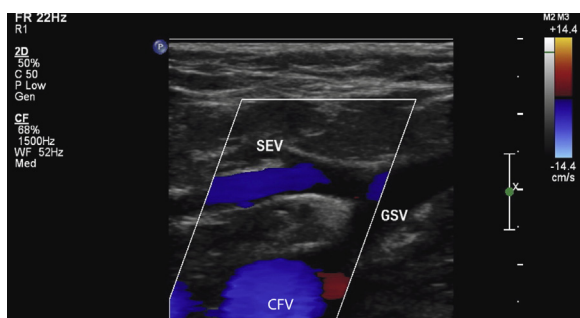


Fig 2. Reversal of physiologic flow is demonstrated within the left superficial epigastric vein (SEV) in the same direction as the common femoral vein (CFV) flow. GSV, Great saphenous vein.

ARTICLE HIGHLIGHTS

- **Type of Research:** Retrospective single-center study
- **Take Home Message:** Reversed flow in the superficial epigastric vein on duplex imaging in supine position using augmentation at midhigh or calf level accurately predicted ipsilateral iliac vein obstruction in 15 patients.
- **Recommendation:** The authors suggest that reversed flow in superficial epigastric vein can detect ipsilateral iliac vein occlusion.

Once the SEV was identified, reversal of flow was diagnosed with color Doppler (Fig 2), and duplex images (Fig 3) were used to assess the direction of the SEV flow with augmentation at the midhigh or calf.

Venography protocol. All procedures were performed in an endovascular suite with standard patient preparation and monitoring protocols. Antegrade single-plane phlebography was performed using a Medrad Mark V Plus power injector (Medrad Inc, Indianola, Pa). The device was set at an ejection rate of 10 mL/s, an injection volume of 15 mL, and a pressure of 600 psi. Images were acquired continuously. Nonionic contrast iopromide (Ultravist 370; Bayer HealthCare, Berlin, Germany) was used. The digital subtraction image acquisition rate was ≥ 2 frames/s. A 100% obstruction, characterized by a lack of flow in any segment of the vein, was defined as an "occlusion." The patients in this series all had total occlusions at the time of the initial venogram.

IVUS protocol. A 20-MHz IVUS transducer (Visions PV .035 catheter; Phillips/Volcano, San Diego, Calif) that was used for IVUS imaging was inserted into the distal venous segment through an 8F sheath. The catheter was connected to the Volcano S5 IVUS system (Phillips/Volcano). The veins were assessed for cross-sectional area, extrinsic compression, vein wall thickening, morphology, and the presence intraluminal thrombus.

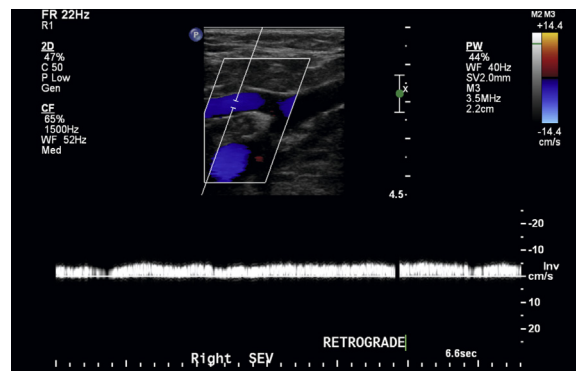


Fig 3. Color Doppler of the superficial epigastric vein (SEV) demonstrates reversal of physiologic flow.

Download English Version:

<https://daneshyari.com/en/article/8672847>

Download Persian Version:

<https://daneshyari.com/article/8672847>

[Daneshyari.com](https://daneshyari.com)