

# Avoiding Misuse and Overuse of Iliac Vein Stenting for Chronic Venous Disease

The importance of appropriate patient assessment and sensible case selection.

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**E**ndovascular intervention with balloon angioplasty and stenting of the iliac and common femoral veins has become first-line treatment for symptomatic deep venous outflow obstruction. Intervention can dramatically change a patient's life, often after being told that the only treatment options are leg elevation, compression stockings, and rest. However, the enthusiasm for helping patients with these procedures is propelling the field forward perhaps beyond its current knowledge base. As we continue to push for data to define the field and outcome analysis to gauge our performance, we need to exercise caution.

## CURRENT STATE OF AFFAIRS

In the current state of medicine, external forces such as insurance companies, government agencies, and corporate hospital systems are increasingly influencing the individual physician's decision-making ability. These forces drive both restrictive behavior, in which physicians may be limited in treatment options available, or potentially permissive behavior, whereby physicians may offer treatment that may be unnecessary, which in turn may drive further restrictions, creating a vicious feedback circle. It is essential to avoid adding fuel to the fire with misuse or overuse of new treatment options, providing an excuse for further restrictions.

Currently, the venous field is under the eye of many regional and national payer systems both in the United States and internationally. The recent publication of the NICE (National Institute for Health and Care Excellence) abdominal aortic aneurysm draft guideline in the United

Kingdom should be instructive for all involved in venous disease as to the pitfalls of ignoring this scrutiny and continuing on regardless.<sup>1</sup>

## INDICATIONS FOR ILIAC VEIN STENTING

### Iliac Vein Obstruction Due to PTS

Proper indications for venous interventions are first and foremost. The clearest indication for iliac vein stenting is to address persistent iliac vein obstruction resulting in post-thrombotic syndrome (PTS). *PTS* is defined as the presence of significant leg discomfort, edema of the involved extremity, hyperpigmentation, lipodermatosclerosis, and/or ulceration present at least 6 months after the initial deep venous thrombosis. Although this condition is not typically life- or limb-threatening, patients experience significant morbidity associated with decreased quality of life (QOL) from both a physical and mental health standpoint.<sup>2</sup> In fact, QOL surveys for PTS parallel patient-reported QOL measures for other severe chronic medical conditions, including congestive heart failure, chronic obstructive pulmonary disease, and advanced diabetes. PTS also carries a substantial cost to society, with increased work absence, increased disability claims, and significant medical expense.<sup>3</sup> In the United States, the costs related solely to the treatment of patients with severe PTS and venous ulceration are estimated to be \$14.9 billion per year.<sup>4</sup>

### Nonthrombotic Iliac Vein Lesions

Another common indication for venous stenting is the treatment of nonthrombotic iliac vein lesions (NIVLs). May-Thurner phenomenon (ie, compression of the

proximal left common iliac vein by the right common iliac artery as it crosses over the fifth lumbar vertebra) is the most common variant. These patients often present with less severe symptoms than PTS patients; however, their QOL can still be negatively impacted.

In this patient cohort, one should consider several factors to avoid overuse. First, venous compression at this location is a normal anatomic variant present in a high percentage of the population. In fact, more than one-third of asymptomatic individuals may have iliac vein compression > 70%.<sup>5</sup> However, the mere presence of a narrowed vein does not qualify for treatment in the absence of symptoms and is an incorrect interpretation of the definition of May-Thurner syndrome (which is most commonly reported). May-Thurner syndrome is not simply compression but also the additional evidence of venous scarring and associated vessel changes that lead to symptoms of persistent venous hypertension. These latter findings are present in only 25% of patients with underlying compression.<sup>3</sup>

Symptomatic patients would be expected to have swelling, discomfort that accompanies the swelling, discomfort worse in the upright position that is relieved with recumbence and leg elevation, and/or skin changes. Certain symptoms suggest that a nonvenous pathology may be responsible, which include but are not limited to neuropathy, radiculopathy, extremity color changes, feeling of a cold limb, and nocturnal pain. These latter complaints are unlikely to resolve with venous stenting. Further, in symptomatic patients, although the threshold for intervention has not been defined, some suggest that the compressive lesion should result in at least 60% area reduction by intravascular ultrasound measurements, otherwise the patient is unlikely to experience any benefit from stenting.<sup>6</sup>

Severity of symptoms is another important consideration. Young patients with mild symptoms should be treated with trials of lifestyle modification including compression stocking use. Permanent alteration of the vessel with stent implantation should be reserved for moderate to severe symptoms that are detrimental to the patient's QOL. Intervention in female patients should ideally be delayed until child bearing is complete. Because the gravid uterus can cause stent compression, low-molecular-weight heparin may be necessary for stent protection during pregnancy,<sup>7</sup> placing both the mother and child at increased risk for bleeding complications.

## CASES THAT WARRANT CONSIDERATION

Iliofemoral venous stenting in certain populations remains controversial and should be carefully considered. This includes patients with CEAP (clinical, etiology, anatomy, pathophysiology) C2 disease (varicose veins), patients with bilateral lower extremity edema

without evidence of inferior vena cava or bilateral iliac postthrombotic disease, patients with lymphedema, and obese patients with a body mass index > 45 kg/m<sup>2</sup>.

## Varicose Veins

Patients with varicose veins and minimal edema should be managed first with superficial procedures. Varicose veins are typically secondary to superficial venous reflux and can occasionally present with swelling in the lower third of the leg. Treating only the superficial pathology is often sufficient to achieve a vast improvement in symptoms. Statistically speaking, a significant number of patients presenting with left lower extremity varicose veins will have anatomic compression of the left common iliac vein; however, a causative role is not implicit. In this situation, treatment of the superficial disease first is a prudent and recommended approach. Exceptions to this strategy might be known occlusion of the iliofemoral system or patients with postthrombotic disease.

## Bilateral Edema

Patients with bilateral edema are frequently referred for venous evaluation. Those with underlying iliac vein or caval occlusions may certainly benefit from reconstruction. These patients often have additional stigmata of venous hypertension including varices, skin damage, and/or ulceration. This is in stark contrast to elderly patients with medical causes of bilateral edema who often have no other signs of venous disease.

Patients with isolated bilateral lower extremity edema should undergo a complete medical workup to identify other more likely causes, including but not limited to congestive (diastolic) heart failure, chronic renal insufficiency, obesity, chronic obstructive pulmonary disease with cor pulmonale, unmanaged sleep apnea, perimenopausal swelling, salt imbalance, and the use of calcium channel blockers. Patients with significant respiratory compromise using home oxygen are poor candidates for elective venous procedures not only from a procedural risk standpoint, but also because of the low likelihood of improving their bilateral edema. Importantly, when venous disease is a suspected cause of bilateral edema, in the absence of bilateral PTS, the authors' recommendation is to treat the more symptomatic side first. Often, these patients will have bilateral improvement in symptoms if they are truly related to venous disease, because of the cross-pelvic venous collaterals.

## Lymphedema

The lymphedema component of swelling cannot be ignored. It is true that severe venous occlusive disease can result in symptoms that mimic the clinical appearance of

lymphedema and that properly treated venous disease in these patients can be life changing. Nevertheless, it is also true that we do not have any current means to detect what percentage of symptoms are attributable to the underlying venous disease versus the lymphedema. It is the authors' experience that patients with lymphedema and underlying iliac venous occlusive disease have better outcomes when the etiology of the venous obstruction is postthrombotic. In these cases, it is more likely that the lymphedema is secondary in nature. In patients with profound lymphedema and an underlying NIVL, the patient's swelling is often unrelated to the NIVL. In the latter group, intervention may be considered if the patient's swelling is painful for the intent of relieving pain, as venous hypertension is typically painful and primary lymphedema is not. Both subsets of patients should be counseled that if the lymphedema is the primary cause for symptoms, they may not improve substantially after stenting even if a venous outflow obstruction is treated.

### Obesity

Body mass index > 40 to 45 kg/m<sup>2</sup> (ie, morbid obesity) should be considered a relative contraindication to venous stenting. Although helpful in select circumstances, venous stasis in the vast majority of these patients is a direct result of central venous hypertension secondary to increased intra-abdominal pressure; this is not improved with venous stenting. In addition, standard follow-up is difficult due to the poor stent visibility on duplex ultrasound secondary to body habitus. The risk for stent complications is also increased as a result of decreased ambulatory status. Instead, patients should be extensively counseled on weight loss strategies and referred to a bariatric treatment center if interested. Compression is essential in this patient population.

### IMPORTANCE OF PROPER TECHNIQUE

Beyond patient selection, proper technique is essential to achieve expected outcomes. Access points need to allow visualization of the entire common femoral vein to the lesser trochanter. Generally, this mandates access via the femoral vein, popliteal vein, or internal jugular vein. Venography can be helpful for providing information on patency and collaterals; however, it is grossly inaccurate for complete diagnosis and procedural guidance.<sup>6,8</sup> Intravascular ultrasound should be used for determining the degree of stenosis, the level of the confluence and profunda, extent of disease, and stent landing zones, as well as confirming final stent success.<sup>6,8</sup> Inflow and outflow should be carefully planned to prevent future stent occlusion. Generally, at least the profunda vein or the femoral vein should be patent. Stents should be of adequate size (generally ≥ 14 mm)

to replicate normal anatomy. Predilation to the size of stents to be implanted is very important to avoid underexpansion of stents. Postdilation is also encouraged.

### CONCLUSION

The absence of a widely accepted and easily applicable objective hemodynamic test for significant outflow obstruction will continue to mean that appropriate treatment will be based on appropriate patient assessment and sensible case selection. Although this makes treatment open to abuse, with adherence to proper patient selection and proper techniques, venous angioplasty and stenting for chronic outflow obstruction can be life changing for the patient and rewarding to the physician. ■

1. National Institute for Health and Care Excellence (NICE). Abdominal aortic aneurysm: diagnosis and management. <https://www.nice.org.uk/guidance/gid-cgwave0769/documents/short-version-of-draft-guideline>. Accessed June 29, 2018.
2. Lubberts B, Pereira N, Kabriel C, et al. What is the effect of venous thromboembolism and related complications on patient reported health-related quality of life. *Thromb Haemost*. 2016;116:417-431.
3. Page RL 2nd, Ghushchyan V, Gifford B, et al. Hidden costs associated with venous thromboembolism: impact of lost productivity on employers and employees. *J Occup Environ Med*. 2014;56:979-985.
4. Rice JB, Desai U, Cummings AK, et al. Burden of leg ulcers in the United States. *J Med Econ*. 2014;17:347-356.
5. Nazzari M, El-Fedaly M, Kazan V, et al. Incidence and clinical significance of iliac vein compression. *Vascular*. 2017;23:337-343.
6. Gagne PJ, Tahara R, Fastabend CP, et al. Venography versus intravascular ultrasound for diagnosing and treating iliofemoral vein obstruction. *J Vasc Surg Venous Lymphat Disord*. 2017;5:678-687.
7. Hartung O, Barthelemy P, Arnoux D, et al. Management of pregnancy in women with previous left ilioacaval stenting. *J Vasc Surg*. 2009;50:355-359.
8. Murphy EH, Johns B, Alias M, et al. Inadequacies of venographic assessment of anatomic variables in ilioacaval disease [abstract]. *J Vasc Surg*. 2016;63(6 suppl):335-345.

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