CHAPTER 18
ILIAC AND VENA CAVA OBSTRUCTIVE VENOUS DISEASE THERAPY

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Introduction

Ilio-femoral (iliac vein and upper femoral vein) and vena cava vein thrombosis involves blood clot formation in the large veins leading from the leg (groin area) and going into the pelvis (iliac veins) and draining into the vena cava (the largest vein in the abdomen) with goes directly into the heart as it enters the chest. Only twenty percent of clotted iliac veins will completely “recannalize” or open back up with anticoagulant (blood thinning drugs) treatment. Sometimes, severe compression of the iliac vein can occur when it is repeatedly hit by the artery that crosses over it (the iliac artery). As similar constriction (narrowing) of the iliac vein can be seen in a young pregnant lady’s with a large uterus with baby within that gradually narrows the iliac vein resulting in a blood clot (vein thrombosis). Although happening more commonly on the left side, over twenty-five percent of the time it can happen to the right iliac vein.

While blood clots in the upper leg and behind the knee (femoral and popliteal veins) often cause mild to moderate symptoms and can be managed with compression stockings, thrombosis or extrinsic compression bad enough to produce an obstruction of the iliac vein causes more problems due to the larger volume (amount) of blood that is trapped in the lower leg. Recanalization or reopening of the clotted vein with anticoagulant therapy alone occurs in only about a fourth of patients. Therefore a majority of patients with this problem remain symptomatic with limb swelling, pain on standing, and the other signs of long term chronic deep venous obstructive disease including skin damage and even ulcers.

Diagnosis

The significant leg swelling and pain experienced with iliofemoral deep venous thrombosis should result in a workup including duplex ultrasound (sound wave imaging of the vein) in the leg, pelvis and abdomen (if possible). This study is not as good in terms of imaging of veins significantly above the level of the groin. To see the pelvic and abdomen veins, noninvasive studies such as a CT (computerized tomography) scan or MRI (magnetic resonance imaging) may be needed to find out where the blood clot is located. Invasive contrast venography (injecting x-ray dye (contrast) right into the correct vein) along with intravascular ultrasound (a sound wave device place into the vein to take pictures from the inside) may be needed to determine with certainty how long the clot is and what veins are involved (Figure 1). Intravascular ultrasound has proven to be more reliable for determining the type of disease, its extent and exact location. Multiple levels of obstruction may occur during an attack of venous thrombosis. Extrinsic compression (something pushing on the vein

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from outside the vein itself) is often found to be located at just one spot near where the iliac veins come together to make the vena cava.

Therapy

Open surgical techniques such as a surgical bypass to jump over the obstructive or stenotic vein are often not needed with the current use of venous stenting (placing a metal support device within the vein to help keep it open). Stenting of the affected vein segment is needed to keep the vein open after dilating it up with a balloon (Figure 1). The stenting procedure is not very invasive, involves little discomfort, and usually does not have many problems during or after the procedure. The femoral vein in the groin or the popliteal vein behind the knee are the places where a needle is pushed into the vein through the skin after numbing medicines have been given. A wire is then passed up the vein to the place in the pelvis or abdomen where the occluded or narrowed iliac vein is located. With some delicate movement of the wire it can often be placed into the obstruction and past into a normal vein above the disease. A balloon can then be passed to the area of disease and blown up to its optimal size to increase the size of the vein. A stent is then placed in the same area which opens up to the new ballooned size and pushes from the inside to keep the vein open. The stent must cover the entire area of diseased vein or its usefulness will not last long. Long term anticoagulation (blood thinning drug) is not needed for those patients with only extrinsic compression problems. The surgeon may need you to take such medicine if the initial damage was done as a result of blood clots. Stents generally do very well in keeping the vein open and in so doing improves the patient’s symptoms of leg swelling and/or helps the ulcer to heal. In-stent stenosis (fibrotic tissue developing within the stent after it is placed) is low at five percent in those patients with only extrinsic compression and but is slightly more common to over ten percent if the obstruction is due to prior venous thrombosis.

Conclusion

Iliac vein or vena cava vein blockage or narrowing prevents blood flow from getting out of the leg(s) since these are the major exit sites for this blood to get back to the heart. Removing blockages from these veins is possible with techniques that allow one to place a dilating balloon and stent (metallic support device) inside the narrowed vein. In the rare case that this is not successful, there are surgical procedures which can help.
Commonly asked questions by patients

Will treating iliac vein narrowing I have heal my leg ulcer?

Venous disease and leg ulcer development has many causes, one of which is proximal obstruction of the vein preventing blood from getting out of your leg. This complete obstruction or very tight vein narrowing results in to much pressure building up in your leg veins. This high pressure in your veins then pushes on the soft muscle, fat and skin especially around the ankle. The result is skin changes and then an ulcer or open wound. If iliofemoral (abdomen, pelvic, proximal groin) venous thrombosis or obstruction is present with an active leg ulcer, stenting of those vein affected is one way to help heal your leg ulcer. Treatment of venous reflux (backward flow of blood in your damaged veins) in the leg may also be needed before or after the stenting procedure. Only your surgeon will know what is the best treatment for your case.

What are the stents made of and can I feel them?

Stents commonly placed in the iliac vein are made of one of two metals; either stainless steel or a nickel titanium alloy. The stents are “self expanding” which means that they open up automatically as they come out of the device (constraining sheath) that gets the stent to the right place in your vein. The stents are made for large vessel sized (diameters) and open, sometimes with the help of a balloon dilation, to go to twelve to fourteen millimeters in diameter (about the size of a quarter). They can be gotten to the pelvic veins by placing a needle in a more easily punctured leg vein in the groin or behind the knee vein (femoral or popliteal vein) and then pushing the stent which is held in a plastic covering on a long wire to the proper place. Once the plastic covering is pulled back and the stent opens in the vein, it delivery wire is taken out and gentle pressure of the needle stick sight stops any bleeding. The venous system is a low pressure blood containing tube and so there is rarely a bleeding problem. Many of these procedures can be done in an outpatient setting.
**Figure 1:** The first picture shows an iliac vein occlusion with many collateral veins (smaller veins going around the blockage) present to help decrease the pressure in the lower as a result of the blockage. The second picture shows a metal stent in the iliac veins which has opened it fully so the collateral veins are no longer seen because the blood is going through the larger and more functional iliac vein. The excess vein pressure in the lower leg has been corrected.