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**

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 **vein**s 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 lower 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.