

# Ilio-Femoral Outflow Obstruction (May-Thurner Syndrome)

## Venous Anatomy and Physiology

Arteries transport blood from the heart into the body providing organs and tissues with oxygen and nutrients. Veins are responsible for return of de-oxygenated blood to the heart as well as temporary storage of venous blood in the legs.

The venous system of the leg consists of superficial, deep and perforating veins:

The superficial veins lie in the layer between the muscles and the skin and consists of an interconnecting network of axial veins, e.g. great (long) saphenous and lesser (short) saphenous veins and their tributaries.

The deep veins lie deep within the muscular layer of the thigh and leg and consist of axial veins that run parallel to the main arteries. These intramuscular structures are the storage units of the venous system and the axial veins are the conduits that facilitate return of blood to the heart.

The perforating veins bridge the superficial and deep veins; perforating the deep fascia of the thigh and leg to connect the superficial to the deep veins.

Superficial, deep and perforating veins have unidirectional valves that ensure blood can only flow in one direction: superficial to deep and from distal (ankle) to proximal (groin). The valves work in concert with the venous muscle pump to return blood back to the heart. Contraction of mainly the calf muscles squeezes the veins forcing blood to flow out of the leg and back to the heart. The venous valves assure that that flow is directed from superficial to deep and from the periphery towards the heart. The net result of this action is that the venous system of the leg is emptied periodically, and that venous pressure is kept low.

## What is Chronic Venous Disease?

The main function of the venous system is to drain the leg of blood and maintain low peripheral venous pressure. Malfunction of this system leads to venous hypertension that in the long term causes chronic venous disease. The most frequent cause of venous hypertension and chronic venous disease is incompetence of superficial venous valves. This typically leads to varicose veins (see Varicose Veins in Conditions). Venous outflow obstructions e.g. May-Thurner

syndrome, and calf muscle pump failure are other important but less frequent causes of venous hypertension and chronic venous disease.

## What is Venous Outflow Obstruction?

Blockages in the deep veins draining the legs, i.e. the pelvic veins, may result from deep venous thrombosis (DVT). Alternatively, compression of the pelvic veins by other anatomical structures, e.g. the adjacent pelvic (iliac) artery may also cause outflow obstructions.

Deep venous thrombosis is a common cause of obstruction of pelvic veins. Without intervention, the thrombus will occlude the vein hampering venous drainage of the affected limb causing venous hypertension. Frequently the acute thrombus recanalises with time re-establishing flow through the affected vein. However, in up to 50% of cases, the total or partial obstruction of the pelvic vein will result in venous hypertension and a constellation of symptoms collective labelled post-thrombotic syndrome (PTS): pain, swelling and skin changes affecting the leg that may include ulceration.

## What is May-Thurner Syndrome?

In 1957, Drs May and Thurner, described narrowing of the left iliac vein and hypothesised that it was caused by compression of the vein against the lumbar spine by the overlying right common iliac artery. The compression, in combination with arterial pulsations causes scarring of the inner lining of the vein. It has been estimated that at least 30% of the adult healthy population exhibits some degree of asymptomatic common iliac vein compression. In certain circumstances, such as after surgery or trauma, cellulitis or medication, this (asymptomatic) narrowing may become symptomatic causing pain, swelling, skin changes or even ulcers. The combination of iliac vein narrowing and symptoms is described as May-Thurner Syndrome (MTS).

## How do we Treat MTS/ Venous Outflow Obstruction?

In the last 15 years a significant body of evidence has emerged showing that treatment of venous outflow obstructions with angioplasty and stenting is very effective both in terms of symptom relief and in terms of maintaining venous outflow patency.

Successful recanalization of iliofemoral outflow obstructions improves swelling and pain in the vast majority of patients and leads to healing of chronic ulcers in two thirds of cases.

This initial benefit also appears to be sustainable >90% of treated veins remaining patent one year after initial treatment without need for re-intervention (primary patency).

## Treatment of Chronic Venous Disease at the Circulation Clinic

The surgeons at the circulation clinic have been trained and have extensive experience in the treatment of patients with chronic venous disease. They offer investigations for superficial and deep venous incompetence including venous outflow obstruction.

Patients with suspected iliofemoral outflow obstructions will be offered specialist diagnostic investigations including duplex ultrasound scanning, CT or MR venography and diagnostic phlebography (venous 'angiogram'). If indicated procedures such as deep venous stenting alone or in combination with common femoral vein endophlebectomy may be offered.



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