The study of the saphenofemoral junction to understand the distribution of refluxes in chronic venous disease

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Before any decision can be made regarding the appropriate therapeutic approach for a symptomatic varicose patient, it is necessary to define his specific area of interest in the venous system. Varicose veins can be subdivided into two main types: superficial and deep veins. The superficial veins are located in the subcutaneous tissue and are responsible for the venous return to the heart, while the deep veins are located in the muscles and are responsible for the venous return to the heart during muscular contraction.

Varicose veins are defined as dilated and tortuous veins that are visible beneath the skin. They can occur anywhere on the legs, but are most common on the posterior aspects of the leg, particularly on the medial border of the tibia. The prevalence of varicose veins increases with age, and is higher in women than in men. The risk factors for the development of varicose veins include family history, obesity, pregnancy, hormonal factors, and certain occupations, such as standing for long periods.

Varicose veins can be asymptomatic or cause symptoms such as pain, swelling, itching, and skin changes. In some cases, they can also lead to more serious complications, such as skin ulcers, venous ulcers, and venous thromboembolism. Therefore, it is important to diagnose and treat varicose veins appropriately to prevent these complications.

The treatment of varicose veins can be divided into conservative and surgical methods. Conservative methods include compression therapy, lifestyle changes, and the use of over-the-counter products. Surgical methods can include sclerotherapy, laser treatment, endovenous ablation, surgical stripping, and vein ligation.

Sclerotherapy is a minimally invasive procedure in which a chemical solution is injected directly into the vein, causing it to swell and ultimately collapse. Laser treatment involves using a laser to destruction the vein walls, while endovenous ablation uses heat to seal the vein. Surgical stripping involves cutting the vein open and removing it, while vein ligation involves cutting off the vein's blood supply.

The choice of treatment method depends on several factors, including the size and location of the vein, the patient's age and overall health, and the patient's preferences. In general, surgical treatment is recommended for larger, more prominent veins, while conservative methods may be sufficient for smaller, less noticeable veins.

Varicose veins are a common problem that affects millions of people worldwide. The prevalence and severity of varicose veins vary depending on several factors, including age, gender, family history, and occupation. Conservative and surgical methods are available for treating varicose veins, and the choice of treatment method depends on several factors, including the size and location of the vein, the patient's age and overall health, and the patient's preferences. In general, surgical treatment is recommended for larger, more prominent veins, while conservative methods may be sufficient for smaller, less noticeable veins.
probability of recovery with reduction of the diameter of the venous axis through targeted surgical interventions on saphenous collaterals.1

Study of the saphenofemoral complex

It must be pointed out that the saphenofemoral junction is just a part of the so-called "saphenofemoral complex." The hemodynamics of this region are both physiologically and pathologically influenced by other structures. By saphenofemoral complex we mean:

- The saphenous arch (saphenofemoral crux with its three branches: common and terminal valve and the preterminal valve, differently positioned). The saphenofemoral junction is part of the crux. It represents the angle between the great saphenous vein and the common femoral vein.
- The femoral valve proximal to (above) the saphenofemoral junction. This valve may not be present in 20% to 24% of patients.9
- The femoral valve distal to (under) the saphenofemoral junction.
- The upper tributaries of the saphenous arch, which in a variable way drain the superficial blood from the lower half of the abdomen. In fact, physiologically, a descending flow toward the arch can be observed. The physiological direction of flux is stated by the orientation of valvarular planes.10

The dynamic study of the saphenofemoral complex consists in the positioning of the Doppler sample above and below the valve to be studied and in the interpretation of the aforementioned investigatory tests. All these tests should point out valvarular incontinence in the various parts of the complex. In this way, the hemodynamics of the region can be exactly described. The purpose of these tests is to determine a targeted therapeutic approach, which may help avoid either incomplete or useless surgical radical, which can in fact accelerate the evolution of the varicose disease, commonly called "post-phlebitic syndrome." The study of the hemodynamics of the saphenofemoral complex must determine:

- The presence of points of reflux represented not only by the incontinence of the saphenofemoral junction but also by the connection that some pelvic points of reflux have with the great saphenous arch through the arterial tributaries. In such cases, we will find arch tributaries that show a Valvula positive reflux. The exact position of pelvic shunts can also be pointed out on the map of the leg.
- The incontinence/continence state of the terminal valve—that is, the valve situated in the area of the saphenofemoral junction. This can vary in ways (complete continence in both the Valvula and dynamic tests performed with the Doppler sample positioned on the femoral side of the superficial femoral valve, in this case, both tests will be negative; (ii) incomplete incontinence, when both tests are positive; or (iii) dissociated findings with a leaking terminal valve under a high pressure charge, but a resting terminal valve when gravitational gradients are applied. In this case, we have a positive Valvula test and a negative gravitational test, particularly when a dynamic test is applied.

- The extension of the incompetence, i.e., whether the reflux is limited to the preterminal, terminal or femoral valve. The study of either the continence or the incompetence of the saphenofemoral complex is performed by positioning the Doppler sample under the inguinal ligament. The probe must be directed toward the saphenous arch in order to be in a proximal position with respect to the femoral valve and for subsequent application of a combination of techniques to number the Valvula and dynamochromatic tests, together with the reflux grade (volume = pressure x volume). The hydrodynamic energy, together with partial factors, determines the venous diameter. In fact there is a correlation between the incompetence extension and the saphenous vein diameter.5
- The level at which the upper arch tributaries drain toward the saphenofemoral junction. This level has been defined as the "geometrical discharge height of the upper arch tributaries." The disconnection of tributaries at a high geometrical height could cause the formation of a collateral that is vicious because of the obstruction (iatrogenic-surgical), and this could be the source of regurgitation of the flow either after crossectomy or after stripping crossectomy. In such cases, it is not associated with points of reflux, as is often shown in maps referring to patients operated on with excessively ablative methods. In these cases, the reflux points are represented not only by the residual venular pressure, but also by a high hydrostatic column. By contrast, the hydrostatic column is very low in tributaries that are located at low geometrical height. The evocation of these collateral circles can cause varicose veins ("nuovoo-scamosis") that represent the re-entry of the regurgitate itself. These are negative Valvula varicose veins. In subsequent years, these areas can become reflux points from the common femoral vein, and therefore can become Valvula positive reflux points. Valvula positive reflux points can also be those varicose veins that originate from tributary disconnection from a pelvic shunt. As a consequence of the aforementioned speculations and findings, it could be argued that the existence of a valve site capable of blocking the blood of the column suspends a fois que l’appareil a été mobilisé. L’analyse de 1294 patients ayant une incontinence de la crosse de la grande veine saphène (complexe saphénofémoral) n’a révélé l’incontinence complète de la jonction saphénofémorale que dans seulement 53 % des cas. Une dissociation n’était notée que dans 6 % des cas. La valvule femorale proximale a aussi été étudiée en utilisant les mêmes critères (par ex. la valeur de la veine saphène du saphénofémoral complexe). Les résultats ont été utilisés au suivi au-delà de la jonction saphénofémorale et au niveau de la veine dans 54 % des cas d’incontinence complète. Lorsque la valvule femorale supérieure est continente, les tests saphénovalvulaires (mesurés au milieu de la cuisse) présentaient un diamètre inférieur à 7 mm.