RECURRENT AND PERSISTENT VARICOSE VEINS

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Since January 1, 1952, I have ligated and stripped over 900 varicose saphenous veins, and from January 1953 more than 350 incompetent ankle communicating veins have been tied. A recent follow-up of over 1,000 patients three to 10 years after operations for venous disorders of the lower limb revealed that there were 90 per cent. of good results, showing that the treatment of varicose veins and post-thrombotic legs can be satisfactory and on a par with other general surgical procedures.

Yet in the period January 1952 to June 1957 over 400 procedures were done for veins that had recurred or persisted after operation; as many as six have been done in a week. These patients returned with complaints of prominent veins, itching, pain, swelling, eczema or ulceration of the leg. These conditions are caused by several factors, either singly or in combination:
1. The diagnosis was incorrect or incomplete.
2. The operation was wrong or inadequate.
3. New varices had developed.
4. Follow-up care was omitted.

Diagnostic Factors
A Wrong Diagnosis
This is illustrated by diagnosing that the internal saphenous vein is varicose when the external saphenous vein is defective and vice versa.

An Incomplete Diagnosis
A common example is when both the saphenous systems are incompetent and only one is recognized. Again, with a varicose long or short saphenous vein, defective communicating veins are often overlooked. These are usually situated above the ankle, less often in the popliteal space, mid-thigh or about the tensor fasciae femoris.

A partial diagnosis becomes more rare as the surgeon realizes the several sites of leaking veins. The sources of leakage of blood under high pressure into the superficial veins are as follows:
(a) The long or short saphenous vein.
(b) Incompetence of communicating veins at the ankle, calf, upper inner tibia, popliteal space, Hunter's canal and tensor fasciae femoris.
(c) Varicosity of the peripheral tributaries of the internal iliac vein.

Either leg may be affected, but seldom equally or with the same vessels, therefore both must be assessed separately. The picture can be affected by previous operations, pregnancy or injections.
In my file of operations on varicose veins there are 36 sections and new presentations still appear as the diagnoses become more comprehensive.

Operative Factors
A Wrong Operation
An incorrect operation naturally follows an error in diagnosis and manifestly the veins and their symptoms will persist. A perfect sapheno-femoral ligation and stripping of the long saphenous trunk is useless for an incompetent short saphenous vein or for defective ankle communicating veins.

In re-operation after procedures to ligate the long or short saphenous veins these veins have repeatedly been found intact; one of their tributaries had apparently been tied. This error is quite easy when the incision is too short and incorrectly placed; it is necessary to know the venous anatomy and landmarks to achieve safe sapheno-popliteal and sapheno-femoral ties, especially in stout persons. The groin incision must be at least 4 to 5 in. to avoid injury to the femoral artery and vein and to ensure location of the long saphenous vein.

An Incomplete Operation
This is frequent. Two common examples are:
If the diagnosis is correct, the operation may fall short of that needed, such as by tying the internal or external saphenous vein at varying distances from their actual junction with the femoral or popliteal veins respectively, so that between the tie and the end of the saphenous vein there remain patent tributaries. The high pressure in the femoral
or popliteal veins continues to pass into these, so maintaining the varicose-forming process in the intricate mesh of superficial veins connected with them. Even though the varicose saphenous trunk is stripped out to the ankle, unless it is tied flush on the popliteal or femoral vein tributaries still connected with the hypertension in the deep veins continue to dilate the adjacent subcutaneous venousplexus and, as the months pass, the varicosities progress. Thus stripping, which has become popular, is a useless procedure without a complete diagnosis and a perfect flush tie on the popliteal or femoral vein to stop the leak of high pressure from the deep to the superficial vein.

Another incomplete operation is when a second, or even a third, source of venous hypertension into the superficial veins is present, but undetected and therefore untreated. Examples are defective communicating veins above the ankle or a faulty vein passing into Hunter's canal, connecting a tributary of the internal saphenous vein to the superficial femoral vein. An incompetent tributary of the popliteal vein, apart from a varicose short saphenous vein, not infrequently causes varices about the leg and calf. A less common incompetent perforating vein may pass through the tensor fasciae femoris to the muscular veins of the thigh. Through all these high pressure from the deep veins can pass into the superficial veins and maintains the varix-forming process. Thus the vital factor in curing varicose veins and their complications is the location and stopping of all the leaks of high pressure between the deep and superficial veins; stripping, multiple ligations or sclerosing injections are merely accessories to these essentials. The diagnosis often occupies 15 minutes and may require a venogram.

**Stripping of the Saphenous Trunk**

A lesser point in persistent varices is that of omitting to excise the varicose saphenous trunk, because, although it is disconnected from its high pressure, unless it is removed its varicose tributaries fill from other vessels and remain statically distended. They will not be so tense or prominent as before the terminal ligation, but they are eyesores. Stripping of the saphenous trunk is excellent for extirpating the saphenous trunk, but let it be emphasized that it is only supplementary to a full diagnosis and perfect disconnection of the leaky connections between the superficial and deep veins.

**A Fallacy Regarding Stripping**

About 1949 stripping of veins became simplified and safe. Some surgeons thought it did away with the need to locate the sources of venous high pressure and also of tying the saphenous veins flush on the parent vein. They imagined that it tore the varicose saphenous trunk flush off the perforating veins as they passed into the deep fascia. This is not so; the connection is usually by one of the tributaries which join to form the communicating vein. Thus stripping is not a shotgun remedy for venous disorders of the lower limb. I repeat, all the incompetent connections between the deep and superficial veins must be located and divided sub-fascially. This is the basic necessity in the cure of varicose veins.

Likewise all the defective ankle perforating veins must be divided; if they are overlooked, swelling and ultimate eczema and ulceration are likely, as the years pass.

**New Varices**

In venous disorders of the lower limb it is fundamental that some people have a tendency to develop venous leaks; it may be familial or a sequel to deep thrombosis, pregnancy, illness or age. These new varices appear insidiously. For instance, a man with a family history of varicosity had his internal saphenous veins tied and injected in 1948. In 1956 he returned with aching legs and his external saphenous veins were found markedly varicose and needed ligation.

An equally important possibility is after deep thrombosis the valves of the ankle perforating veins fail and/or those entering the popliteal vein or superficial femoral vein in Hunter's canal. Cockett showed how the ankle perforating veins are involved in deep thrombosis and that they re-canalize later with faulty valves, and swelling, pain, ulceration and eczema about the ankle gradually appear.

Early ligation of incompetent communicating veins avoids recurrent incapacitation and ulceration. Saphenous ligation in such patients is ineffective in preventing re-ulceration. Clinical and venographic studies have led to the recognition of incompetent perforating veins passing into the femoral vein in Hunter's canal, which also cause persistent varices.

**Follow-up Inspections**

After the treatment of varicose veins a follow-up for five years is advisable. These inspections reveal errors and omissions in the diagnosis and permit corrections before symptoms can develop. If several leaking veins are suspected the obvious ones are treated and the patient is re-examined regularly so that the diagnosis can be completed. The after-care varies with the development of the veins and their complications. Uncomplicated veins require but an annual inspection, but advanced venous disorders need more supervision. Small persisting varicose tributaries are injected,
thereby removing eyesores. Those who had ulcerated legs are taught how to care for them by bandaging or elastic stockings.

Arterial disease, diabetes, erythro-cyanosis and rheumatoid arthritis are superimposed in some persons, but vigilance will keep these patients well.

The Treatment of Recurrent Varicose Veins

Persistent or recurrent varicose veins are managed, as are those seen for the first time.

A diagnosis is made from the history, inspection, palpation, tests of the cough impulse, digital percussion and tourniquet. These may be inconclusive, but a venogram will often locate the defective veins. This technique is now straightforward and safe (Dodd and Cockett, 1956).

Operation

The sites of high-pressure leak or leaks from the deep veins into the superficial veins are exposed beneath the deep fascia and the vessels are divided, if possible, flush at their entrance into the main vein.

There are five common leaks of venous hypertension and increasing experience shows that several may co-exist, although one or two are the usual finding. The sapheno-femoral and sapheno-popliteal junctions are the most common and then the incompetent communicating veins above the ankle. The communicating veins passing into the femoral vein at Hunter's canal and into the popliteal vein around the knee joint are not infrequent. Defective veins perforating the tensor fasciae femoris and the hamstring muscles are more rare.

The Operations for Recurrent or Persistent Long and Short Saphenous Veins

An operation in the groin or popliteal space in the presence of the varicocele-like masses of thin-walled veins and scar tissue which develop after inadequate ligations may require 1 to 1½ hours; the principle followed is that of approaching the femoral or popliteal veins through virgin tissue and working up or down until the sapheno-femoral or sapheno-popliteal junctions are found. These are transfixed with fine thread and divided. Then the faulty saphenous trunk is exposed at the ankle; the stripper is passed along it and the trunk is stripped out.

For the recurrent long saphenous vein, the sapheno-femoral junction is exposed through an incision at Poupart's ligament, curving on to the thigh. The femoral sheath is opened and the femoral vein exposed. This is traced down about 1 in., when the long saphenous vein is seen bulging from its anterior surface. This is gently defined until a ligature can be passed round the sapheno-femoral union, which is secured by tying and a transfixion stitch. In 40 per cent. of cases the fragile varicose deep external pubic vein and/or the postero-medial vein join the inner side of the sapheno-femoral junction, inside the foramen ovale. They are easily torn with sanguinary results. A wide exposure and division of the front of the femoral sheath and awareness of their existence enables them to be safely tied.

The Persistent Short Saphenous Vein

The S-shaped incision ensures a complete definition of the popliteal vein and sapheno-popliteal junction. The skin, fat and deep fascia are incised in the same line and the flaps are reflected. The popliteal and short saphenous veins are dissected; beginning above and below the scar tissue and working in the appropriate direction, the sapheno-popliteal union is cleaned. The numerous divisions of the medial tibial nerve are avoided. The end of the short saphenous vein is transfixed and the trunk is stripped out from the ankle. The popliteal vein is most superficial at the level of the knee joint and it is useful to locate it early.

Pseudo-short Saphenous Veins

Other tributaries of the popliteal vein may be varicose and cause varicosities in the leg. They become apparent as the flaps of the S-shaped incision are reflected and the popliteal vein is defined. The incompetent tributaries are divided flush on the popliteal vein, as omission to do this is followed by a disappointing result. The muscular vein from the inner head of gastrocnemius is most often defective; it can be as large as the popliteal vein.

The Communicating Veins of Hunter's Canal

The division of communicating veins of Hunter's canal requires a large incision to expose the anterior and posterior borders of sartorius, which is reflected inwards, and the faulty veins can be seen joining the superficial femoral vein. There may be one to three such veins, one of which may be in two divisions. As a rule one or perhaps two are manifestly varicose.

The Incompetent Ankle Communicating Veins

The ankle perforating veins are often overlooked clinically and this accounts for the persistence or recurrence of painful, swollen, ulcerated or eczematous legs. A two- to four-year follow-up is showing that their ligation is most satisfactory. With me, the procedure consists of three parts: first, the division of three perforators immediately behind the lower tibia; second, the division of the middle or calf communicating vein at the medial junction of the gastrocnemius and tendo Achillis;
and last, division of the lateral perforating veins, of which there are usually two immediately outside the tendon Achillis.

The procedure is done sub-fascially, through an incision 10 in. long, ½ in. behind and parallel to the posterior border of the tibia, beginning at the internal malleolus. The bleeding is often copious; additional enlarged perforating veins may be present and are tied. My follow-up has shown that the extra-fascial operation, as initially suggested, is occasionally followed by recurrent symptoms.

Conclusion

Recurrent varicose veins are regrettably common, but they are curable by a full diagnosis and adequate operations (these are intellectually satisfying, but exacting).

Venous disorders of the lower limb are a 'continuing' and not a 'dying' disease. Numerous citizens, who are otherwise well, are partially incapacitated by them. These patients comprise the commonest surgical condition. Most persons, including the aged, can be returned to economic and social circulation, materially improved, if not cured, by good treatment.

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