THE 'STRIPPING' OPERATION FOR VARICOSE VEINS

By HAROLD DODD, Ch.M., F.R.C.S.

Surgeon to St. Mary's Hospital Group, Paddington; King George Hospital, Ilford; Royal Hospital, Richmond; Royal London Homoeopathic Hospital

The procedure of stripping-out the varicose trunk of the internal or external saphenous vein is being used increasingly. It was first devised by Mayo (1906) and Babcock (1907), but it fell into desuetude on account of the apparent effectiveness and simplicity of sclerosing injections for varicose veins. During the last decade (1945-54), because the various remedies for varicosities have proved to be often of temporary benefit, stripping has been revived by surgeons in America (Barrow, 1948), Britain (Foote, 1954) and Canada (Fratkin and Jackes, 1951).

The purpose of this article is to describe the stripping operation that has been carried out over 400 times beginning January, 1952. These cases were undertaken to compare with 670 patients with varicose veins treated by sapheno-femoral or sapheno-popliteal ligation followed by internal curettage and sclerosant injection of the saphenous trunk in the five years 1947-51. This method gave 92 per cent. of satisfactory results after two and a half to five years. Although the period during which stripping has been performed is short (two years), the results compare already favourably with those of the previous group, because they require fewer post-operative injections (Linton (1949) also found this). Thus during my out-patient sessions until 1953 it was usual to give 20 to 30 post-operative injections, but now after the stripping treatment only three to six injections will be needed during a similar clinic.

The principle of the two operations is the same, i.e. terminal sapheno-femoral or sapheno-popliteal ligation for the incompetent internal and external saphenous veins respectively, division of any defective communicating veins and elimination of the varicose saphenous trunk.

I would emphasize the importance of the accuracy of the diagnosis, especially must inefficient communicating veins be located and divided as well as the varicose saphenous system terminally ligated. If these conditions are unsatisfied, the

best stripping of varicose veins will be followed by the reappearance of more varices in one to three years of the operation. Further, to avoid infection, good technique and towelling are necessary.

The Technique of Stripping the Internal Saphenous Vein

A 'hockey-stick' incision is made, its centre approximately in the groin at a point $1\frac{1}{4}$ in. below and external to the pubic spine. The outer half of the incision lies in the crease of the groin and the lower half curves downwards and parallel to the labia or scrotum for about 2 in. This approach will expose the end of the long saphenous vein and its terminal tributaries, all of which are divided. The saphenous vein is ligated twice at the sapheno-femoral junction; especial care is taken that no tributary remains undivided, an easy condition apparently, yet after over 20 years of varicose vein surgery I find that the deep external pubic or superficial epigastric veins are overlooked readily. After general haemostasis, a swab is placed in the wound.

The Ankle

The internal saphenous vein is exposed at the ankle as it lies in the groove in front of the anterior border of the internal malleolus; a transverse incision 1 in. long is made. The internal saphenous vein lies on the deep fascia, is straight, pale blue, thick walled and accompanied by the saphena nerve which is detached out of harm's way. The vessel is ligated and half cut across just above this.

The Stripping Instrument

Myer's stripper (Fig. 1) is an excellent pattern. It consists of a flexible cable about a metre long with a rounded tip at one end and a stripping shoulder at the other.

Stripping the Internal Saphenous Vein

The stripper is inserted into the already opened saphenous vein at the ankle and is threaded up the

FIG. 1.—Myer's stripper about to be introduced into the internal saphenous vein at the ankle.

saphenous trunk to the groin (Fig. 1). It occasionally impacts in a varix but with twisting, to and fro movements of the stripper and manipulation of its tip through the skin at the hold-up it is usually possible to pass it through even a sinuous saphenous vein. When the tip of the instrument appears in the saphenous vein at the groin, the vessel is divided distal to the sapheno-femoral ligatures and the stripper emerges and is drawn out until the other end is flush with the ankle wound. Here a ligature is tied round the vein and stripper and the saphenous vein is divided distal to the insertion of the stripper. Traction is made on the stripper at the groin; this draws the large stripping shoulder into the ankle wound which is done with the minimum of contact with the skin edges, thereby avoiding the introduction of a skin infection into the vein bed. This is important when there has been an ulcer or eczema about the ankle. The act of stripping the internal saphenous trunk from the ankle to the groin is carried out by a steady to and fro traction on the stripper at the groin so the vein is detached from its bed and it ultimately appears

in the upper wound as a telescoped mass 2 to 3 in. long, impacted on the shoulder of the instrument. During the extraction, the stripper is often held up where tributaries join the saphenous trunk, but insistent gentle pulling overcomes this and the subsidiaries can be felt to snap off and the removal proceeds. Great strength is avoided, time must be given for the separation of the vein from the tissues as it is being threaded through.

Subsidiary Incisions

Occasionally the stripper impacts in the vein possibly caught in an eccentric varix or a sharp bend, or the vein may be narrowed by surrounding scar tissue, previous thrombosis or injection. In this event an attempt to thread it downwards from the groin is occasionally successful. Failing this, the point where the stripper tip is impacted is cut down upon, the vein opened, the stripper is brought to the surface and the vein from the ankle to this place is removed. The instrument is re-introduced as far as it will go and the procedure is repeated until the vessel is eradicated to the

FIG. 2.—A stripper threaded through the external saphenous vein from the ankle to the popliteal space.

groin. Occasionally four additional incisions may be required.

The Technique of Stripping the External Saphenous Vein

The external saphenous is characterized by its variability, in about 60 per cent. of cases it ends in the popliteal space, just over 30 per cent. terminate in the middle or upper third of the thigh, and nearly 10 per cent. end in the deep veins of the calf or in the internal saphenous vein below the knee. On account of these variations, external saphenous vein stripping begins at the ankle. The vessel is exposed at the outer border of the tendo-achillis 2 in. above the tip of the external malleolus, where it lies on the deep fascia, being straight, pale blue and thick-walled with the large sural nerve on its outer side. It is defined and ligated at the lower edge of the wound, just above this it is half cut across and the stripper is introduced; in many of the cases it impacts at the sapheno-popliteal junction in the popliteal space where it is cut down upon. In a thin

patient where the vein end is located surely, this can be done through a transverse incision, but it gives limited access and in stouter subjects, especially where the site of the sapheno-popliteal union is uncertain, a midline longitudinal approach gives a surer approach although an unsightly scar is prone to follow. The deep fascia is incised longitudinally and the external saphenous vein with the stripper inside it is felt for in the popliteal space. The vessel is dissected out and followed upwards until the sapheno-popliteal union is exposed. This point is ligated twice and the short saphenous vein is divided below this. Advancement of the stripper causes it to emerge from the vein and it is drawn through the ankle until the stripping shoulder is almost in contact with the lower wound (Fig. 2). A ligature is tied round the stripper and the vein is divided distally. The saphenous trunk is stripped like the internal saphena by pulling it from the ankle to the knee.

The happy event of the stripper negotiating the entire external saphenous trunk does not always follow. It may impact as it enters the

FIG. 3.—The 'stripped' vein, note the torn tributaries.

aponeurotic canal at the mid-calf, at the entry of a large tributary where there may be a blow-out, especially at the upper two-thirds of the calf and again where it dips into the popliteal space. When this occurs, if manipulation fails, the vein is cut down upon by a transverse incision, divided and stripped up from the ankle. The stripper is re-inserted until it lodges at the sapheno-popliteal junction.

The stripper may run up the saphenous vein to the middle or upper third of the thigh; this is checked by appropriate exposures until the sapheno-popliteal union is found. The high termination of the external saphenous vein into the internal saphenous is likewise followed up by further incisions and the vein stripped to here. The high termination suggests the possibility of the internal saphenous vein being inefficient so this is tested and dealt with if necessary.

The stripper may impact at an ending of the external saphenous vein in the muscular part of the calf or in the internal saphenous vein below

the knee. In either case, it is cut down upon and the vessel stripped.

Bleeding

After stripping the saphenous trunk the bleeding is sometimes copious, but it is quickly relieved by tilting the patient into the Trendelenberg position. A further haemastatic step is that of after about 3 in. of vein have been stripped above the ankle, the wound here is sutured and the assistant starts to bandage the limb firmly with a sterile crepe bandage beginning at the ankle and following the stripper as the surgeon eradicates it. Thus immediate pressure is applied to the vein bed and haemorrhage is minimized; it is referred to as the 'clean stripping' method.

Closure of the Wound and Dressing

The wounds are closed accurately and dressed securely. The leg and thigh are bound with a crepe elastic bandage starting round the foot and extending to the groin; this is kept on for 36 to 48

hours. The foot of the bed is elevated 12 in. for two days. Patients get up as soon as they are round from the anaesthetic for bed making, toilet purposes, and to walk round the bed. They may not stand, or sit with the legs down for a week, and during resting or sitting the feet are well elevated.

After-Care

The discomfort after this admittedly crude procedure is surprisingly small; extensive bruising of the thigh and leg often follow, but it is of no consequence; the subcuticular varices after the stripping generally thrombose spontaneously, but those remaining patent are injected subsequently with 1 to 2 ml. of a sclerosant. All patients are seen at least annually for three to five years.

The Specimen

When the telescoped 'trophy' of the internal saphenous trunk is extended it is 24 to 28 in. long; the external saphenous vein is correspondingly shorter. Several tributaries hang from it snapped off about 1 in. in length (Fig. 3). On opening the vessel, the valves are apparent, they are variable in number although normally there are 12 to 20 valves from the groin to the ankle, but in the average varicose internal saphenous trunk there are only two to four; they seem to be fewer in older patients.

Stripping by Mayo's Ring Stripper

In 1906 Mayo started stripping varicose veins by threading the saphenous trunk through a ring on a steel shaft and moving this subcutaneously along the outside of the vein, thereby freeing it from the fat and tearing off its tributaries. When the instrument is passed to its full length its ring is cut down upon, the vein brought out and the instrument re-inserted along the saphenous trunk until all that it is considered necessary to remove is freed. This method has fallen into obeyance, but occasionally tortuous veins are encountered through which it is impossible to thread Myer's stripper and in such circumstances Mayo's stripper is useful. In gross varicosities all the surgeon's ingenuity is needed to remove the saphenous trunk completely.

Haematoma of the Wound

Two cases of haematoma of the wound have occurred in over 400 stripping operations; the first was cleared by aspirating several times

through a large bore needle; the second required the lower end of the wound at the groin to be opened.

Deep Thrombosis

The possibility of thrombosis of the deeper veins after any treatment of varicose veins is a real one. One case of complete thrombosis of the lower limb has occurred after stripping and another of the leg. Deep thrombosis is a serious complication because it launches the patient on an inevitable career of aching, swelling, itching, eczema or ulceration of the leg, although it may take 30 years to develop. Consequently resident medical and nursing staff are continuously alerted to the possibility of thrombosis and to maintain the prophylactic treatment of pressure bandaging, elevation of the limb and continuous muscular activity. Should thrombosis occur, these three items are continued and in addition Heparin is given intravenously in full doses for 48 hours; Tromexan and Dindevan are not prescribed because they are considered to be unnecessary and dangerous to the blood and to the liver. Sedatives consisting of Aspirin, Phenacetin, Codeine and Papaverine are given four-hourly until the pain has been subsided for 48 hours, for bodily comfort is necessary to permit the patient to exercise by day and to sleep with easy turning at night. If the swelling is marked and shows signs of creeping up the thigh then Papaverine 100 mg. is injected into the femoral artery at the groin morning and evening until the oedema has manifestly subsided to the knee. The elevation of the foot of the bed so that the leg is level with the heart is important throughout this period.

Conclusion

The stripping of varicose veins is described; it promises to be effective and safe, but is subordinate to a complete diagnosis and efficient division of the incompetent connections with the deep veins, i.e. at the groin, popliteal space and variously in the leg and thigh.

BIBLIOGRAPHY

- BABCOCK, W. W. (1907), 'A New Operation for Varicose Veins of the Leg,' *N.Y. med. J.*, **86**, 153.
- BARROW, D. W. (1948), 'Clinical Management of Varicose Veins,' New York, Hoeber.
- FOOTE, R. R. (1954), 'Varicose Veins,' Butterworth, London.
- FRATKIN, L. B., and JACKES, H. L. (1951), 'The Treatment of Varicose Veins,' *Canad. med. Ass. J.*, **65**, 367.
- LINTON, R. R. (1949), 'Surgery of Veins of the Lower Extremity,' *Minn. Med.*, **32**, 38.
- MAYO, C. H. (1906), 'Treatment of Varicose Veins,' *Surg. Gynec. Obstet.*, **2**, 385.