

Table 1 – Tensile properties of leg skin before and after compression.

Parameter	Before compression		After compression	
	Right	Left	Right	Left
MD (μ m)	257 \pm 97	262 \pm 129	383 \pm 128	396 \pm 136
BE (%)	47 \pm 12	47 \pm 12	46 \pm 14	45 \pm 12
HY (AU)	2,665 \pm 872	2,446 \pm 699	3,538 \pm 1,123	3,517 \pm 994

Values are mean \pm standard deviation.

the severity of leg edema. It shows abnormal rheological characteristics at the site of gravitational edema and a significant modification by compression therapy.

The present data support the view that skin distensibility is decreased at the site of edema. The other rheological variables used in this study have not been assessed previously in the gravitational syndrome. The increase in mean HY after pressure therapy while BE remained unchanged suggests a

interindividual variability and the frequent asymmetrical aspect of leg edema, as observed in the present study, would be a limitation to such studies.

Piérard-Franchimont C, Letawe C, Fumal I, et al. Gravitational syndrome and tensile properties of skin in the elderly.

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decrease in the coefficient of viscosity. These findings indicate that the alterations in MD and HY caused by edema may to some extent be reversible. A larger-scale longitudinal study should be carried out to further document the correlation of these findings with clinical progress. The usefulness of such evaluations for assessing the efficacy of compression is obvious. However, the

Recurrence of Popliteal Varicose Veins after SSV Excision

Recurrence of popliteal varicose veins has long been attributed to insufficient excision of an incompetent small saphenous vein (SSV). Indeed, recurrence is common after surgery of the SSV. In order to assess the risk of insufficient excision and to study the mechanism of recurrence, we reviewed 125 popliteal procedures for recurrence after excision of an incompetent SSV.

Among this series, 48 were personal procedures, 43 of which had been performed without preoperative ultrasound exploration prior to 1991. The time (in years) between the first surgical procedure and surgery for recurrence was recorded and these data were compared with those obtained in a previous study of 211 repeat procedures for recurrent inguinal varicose veins. Recurrences were classified into five categories (table 1) according to the anatomical presentation at reoperation. Type 1 recurrence occurred in 17 patients (13.6%) who had an intact SSV with either an inadequate inci-

sion (too high or too lateral) or a simple recanalized suture (three cases of ligation using nonabsorbable sutures). Type 2 recurrence occurred in 53 patients (42.4%) who had a long stump, recognized by its thicker texture, with new superficial varicose communications via a tortuous, fragile, thin-walled vein. Type 3 recurrence occurred in 24 patients (19.2%). In four patients (3.2%) there was a residual dilated, incompetent short saphenous trunk over more than two thirds of its length, connected in depth, without an identifiable origin. In the other 20 patients (16%), there was an incompetent residual trunk whose upper end was associated with a long stump. Neovascularization enabled recanalization of the venous reflux for 1-4 cm. Type 4 recurrence occurred in 29 patients (23.2%) who had incompetent popliteal perforating veins. In two cases, the incompetent perforator in the popliteal fossa was fed by an incompetent residual long stump. Type 5 recurrence occurred in

Table 1 – Anatomical types of popliteal recurrence. Anatomical types 1, 2, and 3 result from insufficient excision of an incompetent SSV (75%), type 4 from the development of perforating veins in the popliteal fossa, and type 5 from varicose communications with the vasa nervorum of the posterior nerves of the thigh.

Type	Anatomy of recurrence	n = 125	%
1	Intact short saphenous	17	13.6
2	Long stump	53	42.4
3	Saphenous trunk	4	3.2
	Long stump + saphenous trunk	20	16
4	Perforating vein in popliteal fossa	29	23.2
5	Sciatic vein	2	1.6

two patients who developed recurrence on a new varicose communication which followed the posterior nerves of the thigh. These two patients had undergone surgery for an incompetent SSV joining the sciatic nerve in the first case and the peroneal saphenous nerve in the second case. Resection had been performed near the nerve. All the junctions of residual stumps were located in the popliteal fossa between 1 and 8 cm except for one located 17 cm above the popliteal fold.

Among our personal series, 43 reoperations for recurrence were performed without preoperative duplex Doppler exploration. Among these, excision was insufficient in 38 (table 2). The five patients reoperated after preoperative ultrasound exploration had a popliteal perforating vein. Recurrence with a popliteal perforator occurred significantly more frequently in men than in women (table 3). The time to reoperation for popliteal recurrence after surgery of the SSV (50% at 6 years) was significantly shorter than the time to reoperation for inguinal recurrence after surgery of the great saphenous vein (50% at 12 years). Insufficient excision was observed in 75.2% of the cases, but 23.2% of the recurrences were due to the development of an incompetent popliteal perforating vein.

These perforating veins were residual stumps of the SSV with complex pathways, unrecognized perfo-

Table 2 – Anatomical types of recurrence by preoperative duplex Doppler results (48 personal cases).

	Without Doppler ultrasound	With Doppler ultrasound
Insufficient excision	38	0
Vein in popliteal space	5	5

Table 3 – Reparation of popliteal recurrence by sex (n = 125). The risk of developing a popliteal perforating vein type of recurrence after excision of an incompetent SSV was significantly higher in men than in women (p < 0.05).

	Men	Women
Recurrent popliteal varicose veins	23.2%	76.8%
Recurrent popliteal varicose veins by a perforating vein in the popliteal space	41.4%	58.6%

rating veins associated with the SSV at the first operation, or a new incompetence developing in several perforating vessels in the popliteal fossa. The lack of preoperative ultrasound data made it difficult to interpret these recurrences. The development of perforating veins in the popliteal fossa is a type of recurrence that is probably the expression of particular hemodynamic phenomena in the popliteal venous circulation. These phenomena probably involve flexion of the popliteal vein, contraction of the calf muscles, and popliteal valvular incompetence, as is frequently demonstrated in patients who develop SSV insufficiency.

Creton D. 125 Surgical operations for recurrent popliteal varicose veins after excision of the short saphenous vein.

Anatomical and physiological hypotheses of the mechanism of recurrence. J Mal Vasc 1999; 24: 30-6.

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