

Room for improvement in reoperation for varicosities of the small saphenous vein

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ABSTRACT

INTRODUCTION: This study was conducted to evaluate the qualitative and quantitative effects of surgery for recurrent varicosities of the small saphenous vein (SSV). To our knowledge, English-language original articles on this subject have not previously been published.

MATERIAL AND METHODS: We identified 47 patients who had had surgery for recurrent varicosities of the SSV between November 2005 and June 2008 at the Vascular Department, Gentofte Hospital, Copenhagen. Twenty-eight were women and 19 were men. Three had had bilateral surgery, so a total of 50 legs had been operated. All patients had their re-surgery to the SSV performed by experienced vascular surgeons after duplex scanning.

RESULTS: The subjects' median age was 57 years at surgery (range 31-67 years) and the median follow-up period was 15 months after secondary surgery (range 3-31 months). Postoperative duplex scan showed 25 legs with no reflux, 19 legs with neovascularisation at the the saphenopopliteal junction (SPJ) and six legs with surgical failure. Examination for nervous lesions showed two legs with severe change in sensibility compatible with damage to the sural nerve. Eight legs had small asymptomatic areas of sensibility change. Among the studied patients, 39 out of 50 reported a positive effect on symptoms after re-surgery.

CONCLUSION: Only 25 of the operations resulted in no reflux of the SPJ. But 39 out of 50 patients reported an overall positive effect on symptoms after re-surgery. Re-operation of the SSV should only be performed by dedicated vascular surgeons and endovenous methods should be explored.

Surgery on the small saphenous vein (SSV) is thought to be more challenging to the surgeon than surgery on the great saphenous vein. This is due to the large variation in the anatomy of the SSV in the popliteal fossa and the close anatomical relationship of the SSV to both motor and sensory nerves [1].

To our knowledge, no English-language papers have yet been published exclusively addressing the results of surgery for recurrent SSV varicosities. A study by O'Hare et al showed that at the one-year follow-up after first time surgery to the saphenopopliteal junction (SPJ), incompetence of the SPJ verified by duplex scan, reached 13% after stripping and 32% after disconnection only.

The study also showed recurrent varicosities in 18% of the cases after stripping and in 24% of the cases after disconnection [2]. Already in 1996, Tong & Royle showed that the most common cause of recurrence following short saphenous vein operations is inadequate surgery [3]. An Italian follow-up study from 1998 showed no reflux at the SPJ in 15/15 legs after reoperation for incompetence of the SSV [4].

The present study was conducted to evaluate the qualitative and quantitative effects of re-surgery in the popliteal fossa in patients with recurrent SSV varicosities. We focus solely on the SPJ and the SSV. Patients who have had prior surgery to other veins in the popliteal fossa (i.e. gastrocnemius, perforants) were not included in this study.

MATERIAL AND METHODS

Using the Danish Clinical Venous Database [5], we identified 63 patients who had re-surgery in the popliteal fossa for recurrent symptomatic varicosities of the SSV between November 2005 and June 2008 at the Vascular Department, Gentofte Hospital, Copenhagen. These patients were invited by letter to participate in this follow-up study through retrospective study of medical records. Among the 63 patients contacted, six patients did not respond, even to a second invitation, and six patients were unable to participate. The medical records examined for the remaining 51 patients revealed that four of the patients had been coded inaccurately in the database: they had actually received primary SSV surgery and they were therefore excluded from the study.

Thus, a total of 47 patients were examined in our outpatient clinic, three of whom had had bilateral surgery, which yielded a total of 50 legs studied. Thirty-four

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Ultrasound scan
of fossa poplitea.

TABLE 1

Results of postoperative duplex scanning in the popliteal fossa.

	n (%)
No reflux	25 (50)
Neo-reflux	19 (38)
Failure of operation	6 (12)

n = number of legs.

TABLE 2

Self-assessed score compared with duplex scan results for each leg.

Effect of the second operation	n (%)	No reflux, n	Neo-reflux, n	Failure, n
Free of symptoms	18 (36)	16	2	0
Better	21 (42)	8	11	2
No effect	6 (12)	0	3	3
Worse	5 (10)	1	3	1

n = number of legs.

patients had their primary surgery performed at a private surgery practice, six at various general hospitals across Denmark and seven at our Vascular Department. In all patients, primary surgery was performed through a 4–6-cm incision in the popliteal fossa. The median time between primary and secondary operation was nine years, (range six months to 38 years).

Before the second operation, a duplex scan was performed as recommended by the Danish National Board of Health prior to all redo surgery for varicosities or venous reflux [6]. The scan was performed in the popliteal fossa and along the SSV. These legs all had a non-interrupted SPJ. Six specialists in vascular surgery performed all operations. All subjects were in general anaesthesia and surgery was performed with preoperative duplex marking of the saphenofemoral junction. All 50 limbs were intended to be flush-ligated at the SPJ, and two also had the SSV stripped. In the remaining 48 cases, a few centimetres of the vein were resected. All legs had from one to five stab avulsions.

All patients had a full-leg, one-layer bandage for six days after surgery. This was supplemented by a short compression stocking, class 1, for six weeks. In case of skin affections, i.e. eczema and/or ulceration, compression stockings were recommended until the skin had healed.

At the follow-up, all patients were interviewed regarding their pre- and postoperative symptoms and they were invited to categorize the overall effect of their second operation in terms of 1) no symptoms, 2) better, 3) no effect, or 4) worse symptoms. A standardized test for nervous lesions was done by comparing differences in the sensibility using cotton swabs, and motor function

TABLE 3

Correlation between symptoms and duplex scan.

Effect of the second operation	No reflux, n	Neo-reflux or failure, n	χ^2 test, p value
Free of symptoms or better	24	15	
No effect or worse	1	10	< 0.01

was tested comparing extension-flexion of the ankle joints. A visual examination for varicosities and skin lesions such as eczema and venous ulcers followed. Finally, a duplex scan of the popliteal fossa was performed using a HDI 5000 ultrasound scanner with a 7–4-MHz linear array transducer, with the patient in a standing position and the extremity relaxed. Reflux was defined as a retrograde flow lasting more than 0.5 s when compression to the calf was released [7]. The interview, visual examination and duplex scan were performed by an independent specialist in vascular surgery. The findings of the physical examination were used to classify the legs according to the Clinical, Etiologic, Anatomic, Pathophysiologica (CEAP) classification [8].

RESULTS

A total of 28 women and 19 men participated in this study. Their median age was 57 years (range 31–67 years). The median follow-up was 15 months after the second operation (range 3–31 months).

At follow-up, the SPJ was not visible by duplex scan in 44/50 of the operated legs, but in 19/50 of the legs, reflux was seen in tiny veins where the SPJ had been resected. Six legs still had a SPJ and a fully visible saphenous vein and they were therefore classified as failures (Table 1).

Examination for nervous lesions showed two legs with change in sensibility compatible with symptomatic damage to the sural nerve. An additional eight legs had minor areas with slight sensibility change also compatible with damage to the sural nerve, but none of these patients had themselves discovered the sensibility change prior to our examination. No patients had lesions to motor nerves.

Table 2 shows the patient's self-assessed score of their second operation. A positive overall effect was reported by 39/50 patients. Table 2 also shows a positive correlation between the duplex scan and the patient's assessment of the effect of the operation. In the group of patients who considered themselves free of symptoms, most legs were without any reflux in the popliteal fossa. In those who found that their symptoms had worsened after the re-operation (five legs), only one case had no reflux. This leg was considered worse by the patient because of a severe change in sensibility due to

nervous lesion. The sensory change in the other nine patients did not affect the self-assessed score.

Figure 1 shows the pre- and postoperative clinical classes in the CEAP. Patients were classified according to the highest class. Only eight limbs were in the C2 group both pre- and postoperatively. In the preoperative C2 group, 26/26 patients were symptomatic. In the postoperative group, only 5/20 were symptomatic.

DISCUSSION

Although the SPJ was not visible by duplex scan in 44/50 of the operated legs at follow-up, 19/50 had reflux in small veins in the popliteal fossa, which we interpreted as neovascularisation. However, 39 of the patients reported an overall positive effect on their symptoms from the operated leg after re-surgery. In light of the recurrence rates after primary surgery reported in other studies, we may argue that the main goal of relieving the patients of their symptoms and gaining clinical benefits was, indeed, reached.

We found a failure rate of 6/50 legs (12%) after re-operation for incompetence of the SSV. No correlation was observed between failure and operating surgeon. A study by Pachler et al showed a 7% failure rate after primary operation for SSV incompetence [9]. A summation analysis from 2005 that included four studies reported a 29% recurrence rate after primary surgery attributable solely to incomplete SPJ ligation [10], even when duplex ultrasound was deployed before surgery.

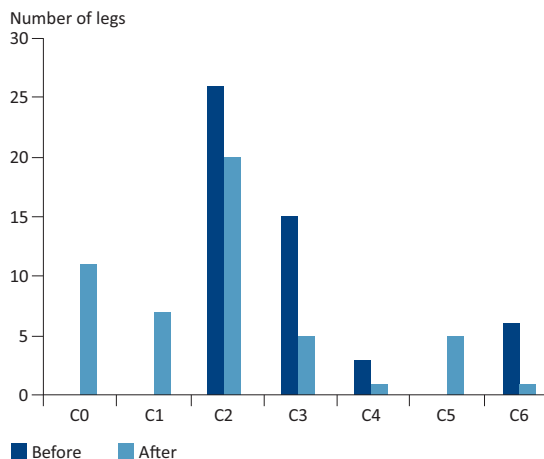
Use of pre-operative duplex ultrasound scan in the popliteal fossa yielded correct anatomical information in 80% of the patients operated for primary SSV disease [11]. Since the vessel diameter in the SPJ often varies much when the patient is in the horizontal as opposed to an upright position, a pre-operative ultrasound scan is mandatory and marking of the SPJ on the patient must be performed.

Our study shows a correlation between the symptoms and findings by duplex scan. The percentage of patients with no reflux in the popliteal fossa was highest in the group that considered themselves free of symptoms, and most failures were found in the group with no change in symptoms (**Table 3**). As expected, an improvement of the clinical presentation according to the CEAP classification was obtained after the second operation, as represented by a leftward shift of the graph (**Figure 1**), which indicates alleviation of the symptoms.

We found that only 25/50 obtained absence of reflux in the popliteal fossa and that a symptomatic sural nerve lesion was seen in 2/50 after re-do surgery. It should therefore be considered whether the benefits of re-operation for incompetence of the SSV outweigh the costs. Even if it correlates with the failure rates found in other studies, the failure rate remains too high. It would there-

FIGURE 1

Refinement of pre- and postoperative clinical classes in the Clinical, Etiologic, Anatomic, Pathophysiological classification.



fore seem appropriate to consider and to explore the new endovenous methods for treating recurrence in this area, as also suggested by Winterborn et al in 2004 [12].

However, new methods need to be validated in proper trials, and until the results of such trials are available, surgery to the SPJ, both primary and secondary, is best performed by dedicated vascular surgeons with a view to minimising the number of failures and complications.

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