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Original article

The outcome of varicose vein surgery at 10 years: clinical findings, symptoms and patient satisfaction

WB Campbell[1], A Vijay Kumar[1], TW Collin[1], KL Allington[1], JA Michaels[2]

As part of the REACTIV (Randomised and Economic Analysis of Conservative and Therapeutic Interventions for Varicose veins) Study

[1]*Royal Devon and Exeter Hospital, Exeter, UK*
[2]*Sheffield Vascular Institute, Northern General Hospital, Sheffield, UK*

***Background*: Data on long-term outcomes of varicose vein surgery are sparse, and 'success' rates vary substantially depending on the method of assessment. This study used a variety of methods to evaluate patients 10 years after operation.**
***Methods*: A consecutive cohort of 100 patients was identified, of whom 70 (151 operated limbs) were reviewed – 50 by clinical and Doppler examination, and all by structured questionnaire.**
***Results*: A few months after operation, symptoms were 'cured' or 'much better' in 89% of patients, and remained so at 10 years in 77%. Only 30% patients were completely free of recurrent varicose veins at 10 years (both by self- and clinician-assessment): 44% had 'just a few' varicosities while 26% had varicose veins 'as badly as before'. Only 24 patients (34%) were not 'generally pleased' at 10 years, because of continuing symptoms (3), recurrent varicosities (13), and other miscellaneous reasons.**
***Conclusions*: Although some recurrence of varicose veins is frequent 10 years after operation, surgery provides long-term relief of symptoms in the great majority of patients.**

Key words: Surgery – Varicose veins – Follow-up

Operations for varicose veins are very common, yet data on long-term results are sparse[1–4] (most series have had follow-up intervals of 5 years or less[5–12]). Criteria by which recurrences have been judged are often obscure,[13,14] and Table 1 shows the variability of reported recurrence rates: a recent consensus meeting has emphasized the difficulties in interpreting these data.[15] Those long-term results which do exist come largely from the years before ultrasound assessment was routine.[16–19] About 20% of patients presenting to hospital for treatment have had varicose vein surgery before,[20] and most studies on recurrent varicose veins have used these patients as their starting point:[21–26] little is known about the many others who have had operations, and whose veins may also have recurred.

Studies on the quality-of-life and cost-effectiveness of varicose vein treatments have also assessed patients only in the shorter term,[27–29] but the size and importance of this

Correspondence to: Professor WB Campbell, Consultant Surgeon, Royal Devon and Exeter Hospital, Barrack Road, Exeter EX2 5DW, UK. Tel: +44 1392 402702; Fax: +44 1392 402714

Table 1 Recurrence rates of varicose veins after operation, assessed by a variety of different methods, in studies published since 1970

First author and year	Patients (*n*)	Duration of follow-up (years)	Recurrence rate (%) [randomised to stripping]
Hobbs 1974[1]	275	6	20 'cured', 80 'improved'
Larson 1974[2]	1000	up to 10	See text
Rivlin 1975[3]	1993 legs	5–10	7
Jakobsen 1979[5]	161	3	10 'satisfactory'
Negus 1986[6]	71	3–6	15
Munn 1981[7]	50	3	37*
Koyano 1988[8]	208	3	11
Hammartsen 1990[9]	24	4	33*
Sarin 1994[10]	43	2	35*
Laurikka 1994[4]	126	11	28
Jones 1996[11]	64	2	25*
Dwerryhouse 1999[12]	78	5	14–21

Some studies have included a wide range of follow-up intervals but, in general, mean intervals are shown. The numbers of patients actually followed up were not clear for some of the studies, so patient numbers are indicative rather than exact. Recurrence rates have been interpreted and simplified as far as was possible

*In studies which compared stripping of the long saphenous vein with other methods, figures have been used for patients who had stripping of the vein, because these results were generally the best, and this is the standard modern method (used in the present series).

issue have stimulated the REACTIV (Randomised and Economic Analysis of Conservative and Therapeutic Interventions for Varicose veins) study, comparing the cost-effectiveness of conservative management, sclerotherapy and surgery in 1000 patients with a follow-up interval of at least 5 years. As part of the pilot work for this study, a cohort of patients was reviewed 10 years after varicose vein surgery. The aim was to discover rates of recurrence (assessed both subjectively and objectively), symptom relief, problems, and patient satisfaction both in the short and longer term.

Patients and Methods

A consecutive series of 100 patients who had operations for varicose veins under the care of a single consultant (WBC) between January 1989 and May 1990 was reviewed 10 years later. There were 34 men aged 20–74 years (median, 55 years), and 66 women aged 18–83 years (median, 48 years): the overall median age was 51 years.

Collection of data involved three steps:

1. A proforma was completed from details in the case notes. Out-patient clinic data included the indication for operation (the main symptom[s]), previous treatment, and findings on hand-held Doppler examination (reflux in the long saphenous vein, popliteal fossa, or any other site). The identity of the examiner was recorded. Operation data included the number and grades of all operating surgeons and the type of surgery (for each operated leg).
2. Patients were invited to return to hospital for review. They were interviewed using a structured questionnaire (Appendix), and were examined clinically and by hand-held Doppler for recurrent or residual varicose veins. This was done by one registrar (AVK) and one senior house officer (TWC), using the same method as the original pre-operative assessment (done by WBC in 96% of patients).
3. Attempts were made to trace all patients who had not attended for clinical review, to establish a reason, and to request completion of the questionnaire (above).

Statistical comparison of groups of patients/legs was done by χ^2 analysis with Yates' correction for small numbers.

Results

Among the 100 patients, 49 had surgery to one leg only (51 both legs) giving a total of 151 operated legs (79 right and 72 left). Table 2 shows the symptoms for which operation was done (note that most patients complained of more than one 'main symptom'). A total of 37 (25%) limbs had been treated previously by sclerotherapy, and 19 (13%) by surgery.

Hand-held Doppler examination showed long saphenous reflux in 130 (86%) limbs, popliteal fossa reflux in 25 (17%), and reflux in other places in 36 (24%) (records missing for two limbs, and no comment on the popliteal fossa in three).

Long saphenous surgery was done in 130 limbs (saphenofemoral ligation with stripping in 102 and without stripping in 28; and groin re-exploration in 8) and short

Table 2 Indications for operation

Symptoms	Number of limbs (%)
Aching	97 (64)
Skin changes/eczema	40 (26)
Cosmetic	32 (21)
Ankle swelling	32 (21)
Ulceration	24 (16)
Heaviness	18 (12)
Phlebitis	10 (7)
Bleeding	1 (0.7)
Other	23 (15)

The table lists the main symptom(s) which were recorded in the 151 legs. Figures in parentheses are percentages. Note that many patients reported more than one 'main symptom', so the total percentage exceeds 100%.

Table 3 Patients' perceptions of the results of surgery after a few months and at 10 years

	After a few months	At 10-year follow-up
Symptoms		
Cured	41 (59)	31 (44)
Much better	21 (30)	23 (33)
Same	6 (9)	9 (13)
Worse	0 (0)	3 (4)
Much worse	1 (1) 'phlebitis'	3 (4)
Recurrent varicose veins		
None		21 (30)
Just a few		31 (44)
As bad as before		10 (14)
Worse than before		5 (7)
Much worse		3 (4)

Figures in parentheses are percentages.

saphenous surgery in 24. The senior surgeon was the consultant in 26 operations, a senior registrar or registrar in 57, and a senior house officer in 17. Most operations involved either two surgeons (20 unilateral and 33 bilateral) or three surgeons (one and nine, respectively).

A total of 53 patients (53%) returned to hospital for review at 10 years: all were interviewed, and 50 were examined. Three patients had died, four could not be traced, and one was in long-term care. Of the remaining 39 patients, 14 responded but did not attend hospital: they were sent questionnaires by post. The final 25 had all moved, but 11 were traced and sent questionnaires. Completed questionnaires were returned by 17 of the 25 patients, and none described dissatisfaction with treatment as a reason for declining clinical review. In total, therefore, long-term follow-up information was obtained for 70 (70%) patients – 50 by clinical examination (83 operated legs), and 20 by questionnaire (28 operated legs). Follow-up was not possible for 30 patients (40 operated legs).

In the interval between their original operation and follow-up, 8 patients (11%) had received further treatment for varicose veins (10 legs – six treated by surgery, two by sclerotherapy, and two by both methods).

Table 3 shows the reported effect of surgery on patients' most troublesome symptoms after a few months (early) and after 10 years. Symptoms were 'cured' or 'much better' in 89% early and 77% at 10 years. Symptoms 'worse' at 10 years were cosmetic appearance (3) and aching (3), and 'the same' were cosmetic appearance (1), aching (6), pain (1), and skin change (1).

There were no significant differences between the reported results of patients who had and had not returned for clinical follow-up, with symptoms 'worse' or 'much worse' in 4 of 50 (8%) and 2 of 20 (10%), respectively, and recurrent varicose veins 'worse' or 'much worse' in 6 of 50 (12%) and 2 of 20 (10%), respectively.

At 10-year clinical review, the clinicians judged that 35 patients (70%) had some visible varicose veins (anywhere on their operated leg[s]): of these, 22 (63%) had reflux detectable by hand-held Doppler. Of the 15 (30%) patients with no varicose veins at all on follow-up examination, only 1 (7%) had reflux on Doppler assessment.

Among legs dealt with by saphenofemoral ligation and stripping and assessed clinically at 10 years (total 57), the recurrence rate was 23% (13) for one or more varicose veins (> 5 mm) above the knee, and 35% (20) below the knee. After saphenopopliteal ligation (total 17), there were 41% (seven) recurrences (all minor).

There were no significant differences in recurrence rates depending on the grade of most senior surgeon, but a trend towards less recurrences (any recurrent varicose veins at all) for the consultant (59%) compared with registrars (77%) and SHOs (71%).

Overall, 59 (84%) patients were pleased with their early result, but only 46 (66%) were pleased after 10 years: the reasons for dissatisfaction are shown in Table 4. Among the 11 patients dissatisfied early on, 9 remained dissatisfied in the long-term.

Discussion

Assessing results of any treatment requires well-defined outcome measures, and this is particularly difficult for varicose vein surgery. Possible outcomes include relief of symptoms, 'patient satisfaction', impact on quality-of-life, adverse sequelae of surgery, freedom from recurrent varicose veins (assessed either by the patient or an observer), and ultrasound assessment for recurrent venous reflux.

The fact that 24 (34%) patients were not pleased with the long-term result of their operation is disappointing, but only

Table 4 Reasons given by 24 patients who answered 'No' to the question: 'in general, are you pleased with the result of your operation now?' (after 10 years)

Reason given	Number of patients
More varicose veins	13
Continuing symptoms	3
Thread veins	2
Recurrent phlebitis	2
Eczema	2
Miscellaneous	8

The reasons given under miscellaneous included: pain, leg and groin always hot, leg permanently blemished, leg goes numb, scars, dry skin around ulcer scar, veins left behind, and very apprehensive.
Six patients gave two reasons.

3 patients gave 'continuing symptoms' as the reason. Relief of discomfort is the main aim of surgery for uncomplicated varicose veins, and this was achieved for most patients in the long-term, even in the presence of some recurrent varicosities. The Edinburgh Vein Study[30] has cast some doubt on the relationship between leg symptoms and varicose veins, but we believe that a careful history can differentiate symptoms caused by varicose veins from those with other problems in most cases. In particular, we ask about the location of discomfort, when it occurs, and whether compression hosiery provides relief.

This study has shown the great variation in 'recurrence rate' depending on the criteria used. Both clinical observation and patients' own assessment for any recurrent varicose veins gave an incidence of 70%, while only 26% claimed to have varicose veins as badly or worse than before the operation after 10 years. Fewer still (19%, 13 of 70) reported that they were not 'generally pleased' at 10 years as a result of recurrent varicose veins: and just 8 had sought further treatment. It is only the latter small proportion of patients who are described in most publications about recurrent varicose veins,[21–26] and this is important to bear in mind when interpreting such studies.

It is not easy to compare our recurrence rate with other reports (shown in Table 1) because of different durations of follow-up, and substantial differences in methodology. Our evaluation was more critical than some other studies – the assessors were encouraged to record any varicosities as 'recurrences', using 5 mm diameter as a guide when in doubt. The most comparable study was by Laurikka *et al*.[4] (126 patients reviewed 10.5 years after surgery). They observed recurrence (any varicose veins) in 65% patients, and 42% had varicosities > 5 mm. Complete symptom relief was reported by 63% men and only 33% women, but 88% men and 75% women were pleased with the long-term result (12% had had re-operation during the follow-up interval).

There has been an expectation that regular use of pre-operative Doppler and duplex[19,31] might reduce recurrence rates,[32] but one study with a year of follow-up has shown no obvious benefit from the addition of duplex scanning to assessment.[33] There are no published data on long-term recurrence rates with and without Doppler assessment: the patients in this study were assessed by hand-held Doppler, but lack of a control group prevented any conclusions about possible advantages of Doppler assessment in the long-term.

Examining our practice critically, the consultant was involved in only 26% operations (although he had assessed 96% patients, and had selected those for operation by trainees). There have been suggestions that operations by non-consultant grades are followed by higher recurrence rates,[34] but Turton *et al*.[35] showed that properly trained junior surgeons could perform thorough varicose vein operations (assessed by postoperative duplex scanning), and Laurikka *et al*.[4] found no significant difference in results between consultants and residents in their 10.5 year follow-up. It remains our expectation that many primary long saphenous procedures will be undertaken by adequately taught trainees (including senior house officers, who have often been very experienced on our vascular unit).

Conclusions

This study has shown that varicose vein surgery provides durable symptom relief for most patients in the long-term, despite recurrence of a few varicosities in the majority. Different methods of assessment influence perceived results considerably, and long-term follow-up with well-defined quantitative and qualitative methods is required to inform future practice and health service planning. The REACTIV Study aims to provide data of this kind, with a new standardised method of clinical assessment, duplex examination, and quality-of-life studies: recruitment of 1000 patients was completed early in 2001.

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APPENDIX

The questionnaire used for structured interviews, and sent to patients who could not attend for clinical follow-up.

1. In general, were you pleased with the result of your varicose vein operation after the **first few months**?

   Yes/No

2. In general, are you pleased with the result of your operation **now**?

   Yes/No

3. What was **the most troublesome** symptom your varicose veins caused you before your operation?

   Cosmetic only/Aching/Heaviness/Ankle swelling/
   Skin trouble or eczema/Phlebitis/Bleeding/Ulcer/Other

4. How did the operation affect your most troublesome symptom after the first few months?

   Cured/Much better/The same/Worse/Much worse

5. How is this symptom now?

   Cured/Much better/The same/Worse/Much worse

6. Since your operation have any varicose veins come back in the leg/legs you had operated on?

   No, not at all/Just a few/As bad as before the operation/
   Worse than before the operation/Much worse than before the operation

7. Have you needed further treatment or support for varicose veins (in the operated leg/legs) since the operation in 1989?

   Yes/No

   If Yes, what treatment/support have you had?

   Injections/Surgery/Stockings/Other

8. Do you think that the operation caused any permanent problems in your leg/legs?

   Yes/No

   If Yes, please specify (*e.g.* numbness, patches of thread veins) _____