

Experience with varicose vein surgery in a day surgical centre

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The Vascular Surgery Department at the Royal North Shore Hospital commenced a day-only surgery programme to expedite the treatment of patients with varicose veins and to reduce the waiting list for these procedures. The aim was also to assess the efficacy of the Day Surgery Centre (DSC) in reducing the waiting list for varicose vein surgery and to evaluate the acceptability of day only surgery, and the results of that surgery, for both surgeon and patient. We conducted a retrospective review of 73 patients who had had varicose vein surgery in the DSC since its use by the vascular unit in January 1992. The operations were performed by a consultant vascular surgeon or fellow in vascular surgery. The patients were reviewed at 1 and 6 weeks postoperatively. Seventy-three patients had their operations in the DSC, 16 of these patients had intercurrent medical illnesses. The surgical procedures took a median of 73 min and the median postoperative time until readiness for discharge was 159 min. All patients were able to be discharged on the day of surgery. At follow-up 20 patients had some postoperative difficulty. Seventy percent of the patients with cosmesis as a presenting symptom failed to attend the routine follow-up appointments. The increase in the DSC utilization rate from 23% in the first 12 months to 60% in the last 12 months of the study reduced the waiting list time from 300 days in 1992 to 68 days in 1994. This median decrease of 7.8 months is significant (95% confidence limits 3.7-12.5 months). The subgroup of patients who failed to attend the routine follow-up appointments emphasizes the psychosocial, as well as the physical, aspects of the surgical problems of varicose vein sufferers in the community. This experience demonstrates that varicose vein surgery in the DSC is a safe and efficacious approach to the modern management of varicose veins, and since its introduction has resulted in a significant reduction in the waiting list for this surgery.

Key words: Varicose veins, ambulatory surgery, waiting list, anaesthesia, complications, deep venous thrombosis

Introduction

Rationing of healthcare resources and the emergence of hospital management tools such as diagnostic related groups (DRGs) have encouraged hospitals to develop more cost-effective approaches to the management of common surgical problems. Outpatient and day-only surgery have had an exponential growth over the last 10 yr. The range of procedures and patient selection criteria is expanding. Currently, in North America, over 50% of elective surgery is performed on an outpatient basis. Healthcare funds have continued to encourage hospitals to provide short-stay facilities wherever possible¹. The treatment of varicose veins in a day surgery unit has been demonstrated to be a safe and acceptable procedure. Patients and their families have readily adapted to the concept of a short-stay procedure and prefer to avoid hospitalization if at all possible^{3,4,9}.

Patients with venous disease tend to be disproportionately represented on vascular surgery waiting lists because they have previously required admission to the same long-stay beds as patients with critical arterial disease. In an attempt to overcome this problem, the Vascular Surgery Department at the Royal North Shore Hospital (RNSH) in 1992 commenced a day-only surgery programme to perform varicose vein surgery in the free-standing Day Surgery Centre (DSC) on the hospital campus. The initial 29 month experience forms the basis for this report.

Methods

A retrospective review of the vascular registry and hospital inpatient case records from January 1992 to May 1994 identified 157 patients who had undergone varicose vein surgery at RNSH. A subgroup of 73 patients had their operation in the DSC. This group constitutes the cohort for this report.

In the DSC there were 76 varicose vein operations performed on 83 legs. Seven patients had a bilateral

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procedure at the same admission while three patients underwent surgery on the contralateral leg at a second separate procedure. Fifty-one patients (51 out of 73) were female. The mean age was 43 yr (range 20–78 yr).

Patients referred by their family doctor were assessed at the vascular surgery outpatient clinic or in the consultant's rooms. Following an initial clinical assessment all patients considered suitable for surgery had a venous duplex scan performed and their suitability for day-only surgery was also assessed. This assessment was made in conjunction with the patient considering their health profile, the type of support available in the home environment and the extent of their venous disease.

Patients requiring extensive surgery (e.g. bilateral long and short saphenous procedures, gross varicose disease) or where surgery was felt likely to be in excess of 90 min, were considered to be unsuitable for day-only surgery. Similarly, if there were major medical comorbidities, such as patients on anticoagulation, significant major organ failure, or receiving complex hormonal or steroid therapy, the patient was not considered suitable for day-only surgery.

Analysis

Only data from the first operation ($n = 73$) for each patient has been included in the analysis of waiting list times, operative times and any potential difficulties associated with the DSC. Data from all 83 legs was used in the analysis of the surgical complications. For the purposes of statistical analysis all data was treated as non-parametric. Confidence intervals for differences between medians were determined by the Wilcoxon rank sum test.

Comorbidity

Patients who had significant intercurrent problems, such as diabetes mellitus, steroid dependent asthma, or significant hypertension underwent an anaesthetic review before a final decision concerning day-only surgery was made. Sixteen out of 73 patients (22%) who underwent day-only surgery had a significant but stable comorbidity (Table 1). In 1992, 23% (11 out of 48) of

Table 1. Sixteen patients with significant but stable comorbidity

Co-morbidity	n
Hypertension	4
Obesity	2
Asthma (requiring regular bronchodilators)	4
Maintenance thyroxine	2
IDDM*	1
Hydrocephalus	1
LLI†	1
Recent alcohol abuse	1

*Insulin dependent diabetes mellitus.

†Lower limb ischaemia

the total varicose vein patients were considered suitable candidates for the DSC; by the end of 1993, this cohort had increased to 60% (45 out of 73).

There was a significant incidence of concurrent hormonal manipulation therapy in women. The oral contraceptive pill was used by 35% (12 out of 34) of the premenopausal group. In women aged 50–70 yr, 50% (8 out of 16) were using oestrogens as part of their hormonal replacement therapy. Women receiving hormonal therapy were required to cease this medication 1 month prior to surgery.

Symptoms and signs

Seventy-two patients had symptomatic varicose veins (Table 2). Eighteen patients had signs of chronic venous insufficiency or superficial thrombophlebitis. No patient with superficial thrombophlebitis had ultrasound evidence of an underlying deep venous thrombosis. In the other 55 patients the commonest symptoms were pain or ache. In addition, 31% (17 out of 55) of this group were worried by the cosmetic appearance of the veins. Only one patient underwent surgery solely for the appearance of the veins.

Operation performed

The operation performed (Table 3) was determined by physical examination in conjunction with the venous duplex results. Patients requiring distal avulsions only in the contralateral leg, underwent combined bilateral

Table 2. Seventy-two patients with symptomatic varicose veins

<i>Symptoms (worse leg) (n = 73)</i>			
Patients without clinically manifest CVI*	55	Patients with clinically manifest CVI or thrombophlebitis	18
Pain or ache	51	Superficial thrombophlebitis	8
Swelling or heaviness	17	Pain or ache	5
Cosmesist†	21	Ulceration	3
		Lipodermatosclerosis	2
		Pigmentation only	5
		Swelling or heaviness	0
		Cosmesist	0

*Chronic venous insufficiency.

† One patient complained of cosmetic appearances only, 32 patients complained of multiple symptoms.

Table 3. Type of surgery

<i>Site of first operation performed (73 patients)</i>	
Long saphenous and avulsions	37
Long saphenous and avulsions plus perforator ligation	22
Short and long saphenous plus avulsions	5
Short saphenous only	2
Avulsions only	4*
Avulsions plus perforator ligation	3

*Plus seven performed on the contralateral side during the same procedure.

procedures ($n = 7$). Those patients requiring high ligation and stripping in the contralateral leg underwent a second separate procedure.

DSC procedure

Patients were admitted for either a morning or afternoon list and would arrive at the DSC 90 min before their operation to allow admission formalities to be completed, as well as review by the nursing, anaesthetic and surgical teams. The patient was re-examined by the surgeon and the veins requiring avulsion were marked with an indelible pen. Patients with incompetent perforator veins were re-examined with duplex scanning in the vascular laboratory on the day of surgery, and the level of the perforator marked, before attending the DSC.

The ambulatory patient was escorted into the operating theatre where a general anaesthetic was administered. The patient received no premedication and underwent induction of anaesthesia with propofol and a short-acting narcotic. Ventilation was spontaneous with a volatile agent, except for the seven patients who underwent surgery in the prone position, who were intubated and ventilated after administration of a muscle relaxant. All patients received intravenous fluids and an intramuscular non-steroidal analgesic during surgery.

Postoperatively the patient was transferred to the recovery ward and later discharged into the care of a responsible adult. On discharge, an appointment was made for the patient to be reviewed in the outpatient department or in the consultant's rooms in 1 week. Three days supply of an oral analgesic and a prescription for a further course of analgesia were given to the patient. The instructions given preoperatively concerning analgesia, wound care, aspirin, early mobilization and a follow-up appointment were reinforced, both verbally and with a written instruction sheet. Contact 'phone numbers to call the surgeon at the hospital, if there were any problems, and follow-up appointment details were included on the instruction sheet.

Deep venous thrombosis (DVT) prophylaxis

Female patients receiving hormonal manipulation were requested to cease this treatment 6 weeks before surgery. On admission to the DSC, all patients received

5000 IU heparin subcutaneously, as part of their DVT prophylaxis, and were instructed to take 150 mg aspirin a day, until the first postoperative visit at 1 week. Early postoperative ambulation was encouraged.

Results

The median operating time was 73 min (range 40–135). The median postoperative recovery time was 159 min (range 147–167 min) at which stage patients were ready for discharge. Two patients remained in the DSC waiting room after formal discharge until their transport arrived. All patients were able to leave the DSC at the conclusion of the recovery period and no patient required re-admission within the following 24 h. One patient contacted the surgeon by 'phone for advice concerning postoperative pain, but did not require an unscheduled appointment.

At the 1 week follow-up appointment 20 patients were recorded as having some postoperative difficulty. Seven patients had a small haematoma related to the course of the long saphenous vein or the groin incision, while 12 were concerned about bruising or induration. None of these findings were clinically significant. The patients were reassured, encouraged to wear surgical support stockings and given some hyaluronidase cream for symptomatic relief. These symptoms had all resolved by the 6 week review and none required surgical intervention. Three patients had inflamed wounds that were treated with antibiotics. No frank sepsis was recorded. No positive microbiology cultures were recorded. One patient, who had undergone short saphenous vein surgery, complained of paraesthesia in the distribution of the sural nerve, but this had resolved by the 6 week review. Five patients required repeat appointments for injection sclerotherapy of residual veins or telangiectasia as part of their treatment programme.

One patient, a 58-yr-old female receiving hormonal replacement therapy, was admitted to hospital on postoperative day 10 with pleuritic chest pain. This patient had a saphenofemoral ligation with stripping of the long saphenous vein to the level of the knee and multiple avulsion phlebectomies of her lower leg varices. The repeat venous duplex study demonstrated fresh thrombus in the peroneal veins and behind the valve cusps of the popliteal vein. The technecium⁹⁹ ventilation-perfusion scintogram was normal. After initial treatment with intravenous heparin, this patient was discharged on maintenance warfarin for 6 months.

Four patients (7%) failed to attend any postoperative follow-up, while 23 (32%) failed to attend the 6 week appointment. Fifty per cent (2 out of 4) of the patients who failed to attend any follow-up visit and 70% (16 out of 23) of the patients who failed to attend the second follow-up visit were single women who had stated that cosmesis was a major reason for their initial referral.

Day surgery utilization rates and alteration in waiting list times

The utilization rate of the day surgery facility, for suitable patients for varicose vein surgery, changed from 23% of the potential patient group in the early part of our experience, to 60% towards the end of the study period. The advent of the day-only programme has shortened the median waiting period for varicose vein surgery from 300–68 days. This reduction of 7.8 months is highly significant (95% confidence limits 3.7–12.5 months).

Discussion

The advent of day-only surgery for varicose veins has coincided with a change in the surgical approach to varicose veins, which facilitates this transition to the DSC⁵. This approach is characterized by a reduction in the number of patients who require inpatient care, changes in anaesthetic practices, a reduction in the long operating time for varicose veins and the development of alternatives to the radical avulsion of varicosities, including the classical 'strip to the ankle' saphenectomy⁶. The principles of ambulatory venectomy⁷ and outpatient techniques, such as stab avulsions using phlebectomy hooks and modified groin-to-knee stripping, have been developed by surgeons *pari passu* with the concept of minimally invasive surgery^{8,9}.

Patient selection is the fundamental consideration in running a day-only surgical programme. Jarrett refers to day-only surgery as "patient care tailored to meet the needs of the non-sick"¹⁰. Generally, the patients should be young, otherwise fit candidates with no significant intercurrent illness. As our experience with the DSC increased, the criteria for suitable patient selection was extended. In our study 7 out of 73 patients were over 60 years of age but in otherwise good health. This subgroup tolerated a same-day surgical procedure with no adverse effects, suggesting that the patient rather than the age group should be the criterion applied in selection. Similarly, the patients with significant comorbidity (Table 1) had an uneventful experience in the DSC. This increase in our confidence with day-only surgery is reflected in the utilization rate for this facility. At the beginning of the programme only 23% of varicose vein patients were considered to be suitable for the DSC, but 2 yr later, 60% of varicose vein patients were considered to be suitable for the DSC. This increase in the utilization rate is highly significant (95% confidence limits of the difference in the utilization rate is 0.21–0.53).

In addition to being medically fit for a day surgery programme the patient should be 'socially fit'¹⁴. The social circumstances of the patient must be carefully considered and access to community nursing support should be available⁴. The appropriate patient should have a support person in attendance on the first night

after discharge and preferably for part of the first few postoperative days providing some domestic help. The patient must live in a suitable environment for recuperation. The family doctor should be aware of their patient's admission to the DSC. The appropriate referral to the community nursing service, if necessary, should be made prior to surgery.

As part of the preoperative evaluation all patients should have a venous duplex study performed prior to admission. The routine use of the duplex study allows accurate preoperative diagnosis of the site of reflux or perforator disease. This approach is important to individualize each operation to ensure the permanent removal of both varicosities and the sources of venous hypertension¹¹. Although 70% of patients with primary varicose veins have saphenofemoral reflux, up to 30% have atypical reflux or atypical varices with no reflux¹. Variation in venous anatomy and pathology are common reasons for recurrent veins¹³. In addition, the cohort of patients with morphologically normal valve leaflets in the presence of a dilated valve annulus can be identified and may be offered a valvuloplasty procedure if appropriate¹⁶.

Preoperative preparation should include a full and detailed discussion of the risks and benefits of the proposed surgery, particularly if cosmesis appears to be a significant indication for surgery for the patient. Certain surgical problems are best treated by anticipation. Apart from an understanding of day-only surgery, an awareness of the usual postoperative complications is important. Problems such as paraesthesia, bruising, haematoma, and wound infection should be fully discussed. Varicose vein surgery can be complicated by deep venous thrombosis¹² and whilst uncommon it is of such potential major significance that it must be discussed in the preoperative consultation.

Our experience suggests that a significant number of patients have cosmetic concerns and the decision to seek treatment, and the results of that treatment have a psychological as well as a physical significance. The low attendance rate at the follow-up visits of this group of patients suggests that these patients perceive their venous disease as part of a body image problem. Once the offending veins have been removed, this problem has been rectified and thus no medical review is necessary. These patients should be told that the varices will be replaced by scars and that the final cosmetic result will vary from patient to patient. In the current medicolegal environment the patient and the surgeon should be aware of all potential complications before, rather than after, surgery.

Day surgery should be regarded as a consultant-based service¹⁵. The DSC has a policy that only specialist surgeons and anaesthetists may operate in the centre to minimize the operating time and to maximize the potential benefit to the patient. This policy answers a common criticism that varicose vein surgery is often left to the most junior and inexperienced member of the

team¹⁴

In conclusion our experience demonstrates that a day-only programme for varicose vein surgery has significantly reduced both the number of patients on our waiting list and the time a patient could reasonably expect to spend on such a list. The DSC has an efficient patient flow from admission, to procedure, to discharge. The complication and readmission rates were acceptable. Use of the DSC is a safe and efficacious approach to the modern management of varicose veins.

We would recommend that other vascular units consider the use of their day surgery facility to provide access to this surgical service for those patients who require operative management of their venous disease.

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References

- 1 Twersky RS. To be an outpatient, or not to be – selecting the right patients for ambulatory surgery. *Amb Surg* 1993; **1**: 5–14
- 2 Dean M. Is your treatment economic, effective, efficient? *Lancet* 1991; **337**: 480–1
- 3 Ruckley CV, Cuthbertson C et al. Day care after operations for hernia or varicose veins: a controlled trial. *Br J Surg* 1978; **65**: 456–9
- 4 Clyne CAC, Jamieson CW. The patient's opinion of day care vein surgery. *Br J Surg* 1978; **65**: 194–6
- 5 Fischer R. A new generation in varicose vein surgery? *VASA* 1991; **20**: 311–18
- 6 Bergan JJ. New developments in the surgical treatment of venous disease. *Cardiovasc Surg* 1993; **6**: 624–63
- 7 Goren G, Yellin AE. Ambulatory stab evulsion phlebectomy for truncal varicose veins. *Am J Surg* 1991; **162**: 166–74
- 8 Chester JF, Taylor RS. Hookers and French strippers: a technique for varicose vein surgery. *Br J Surg* 1990; **77**: 560–1
- 9 Ricci S, Georgiev M. Office varicose vein surgery under local anaesthesia. *J Dermatol Surg Oncol* 1992; **18**: 55–8
- 10 Jarret P, Wetchler B. Editorial. *Amb Surg* 1993; **1**: 3
- 11 Bergan JJ. Surgical procedures for varicose veins: Axial stripping and stab avulsion. In: Bergan JJ, Kistner RL, eds. *Atlas of venous surgery*. Philadelphia: WB Saunders, 1992; 61
- 12 Parvulesco J. La prevention des complications thrombo-emboliques post-operatoires. *VASA Suppl* 1989; **27**: 117–19
- 13 Shah, DM, Chang, BB, Leopold PW. The anatomy of the greater saphenous venous system. *J VASC Surg* 1986; **3**: 273–83
- 14 Bishop CCR, Jarrett PEM. Outpatient varicose vein surgery under local anaesthesia. *Br J Surg* 1986; **73**: 821–2
- 15 The Medical Defence Union. Risk Management in Day Surgery. MDU, UK, May 1992; 3
- 16 Lane RL. Repair of venous valves using silicone cuffs. In: Greenhalgh RM ed. *Vascular and endovascular surgery techniques: An atlas*, 3rd edn, London: WB Saunders Co, 1994; 502–10