Audit

The lateral accessory saphenous vein – a common cause of recurrent varicose veins

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Background: Varicose veins commonly recur after surgery and present a large burden to the NHS. The aim of this study was to demonstrate that the lateral accessory saphenous vein is the commonest cause of groin recurrence of varicose veins and we discuss a possible anatomical reason for this.

Patients and Methods: The case notes of all patients presenting to two vascular surgeons with recurrent varicose veins over a 3-year period were studied. All limbs were assessed by duplex ultrasound scanning. These scans were reviewed to identify the site of recurrence. When recurrence occurred in the groin, the scans were further evaluated to identify the cause of groin recurrence.

Results: A total of 216 limbs in 186 patients were evaluated over a 36-month period. Of these, 141 (65%) demonstrated a recurrence in the groin: 56 (26%) recurrences were due to either incompetent thigh or calf perforators and there were 19 (9%) cases of saphenopopliteal or short saphenous vein incompetence. Out of 141 groin recurrences, 61 (43%) were due to a persistent lateral accessory saphenous vein.

Conclusions: The lateral accessory saphenous vein is the commonest cause of recurrence in the groin of varicose veins. It should be looked for specifically during pre-operative assessment duplex scanning and at primary surgery. If identified at operation, we believe it should be either stripped or avulsed to reduce the risk of recurrence.

Key words: Duplex ultrasound – Lateral accessory saphenous vein – Recurrent varicose veins

In the UK, more than 60,000 patients each year undergo lvaricose vein surgery.¹ The reported recurrence rate varies widely between 7–65%,^{2,3} the wide variation reflecting, in part, the continuing world-wide controversy over the optimal method of primary treatment of varicosities.

Of all varicose vein surgery, 20% is carried out for recurrence⁴ placing a significant burden on the NHS as well as causing further discomfort and inconvenience for large numbers of patients who may have expected their initial surgery to be curative. The cause of recurrent varicosities is

also still debated. Some authors claim that neovascularisation in the groin is the culprit in most cases,⁵ whilst many others maintain that it is simply inadequate primary surgery,⁶ often by inexperienced surgeons, that is to blame.⁷

The purpose of this study was to demonstrate that a common cause of recurrence is failure to identify and deal with a lateral tributary in the groin known as the lateral accessory saphenous vein (LASV). We discuss a potential anatomical reason for this and suggest a simple operative step to reduce the rate of recurrence.

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Figure 1 Duplex 'road-map' which is annotated to identify sites of incompetence and retrograde flow.

Patients and Methods

All patients presenting with recurrent varicose veins to the vascular surgery department of our hospital undergo duplex ultrasound scanning. This delineates the site and cause of recurrence and gives a road-map for surgery in those identified that would benefit from groin re-exploration. We assessed the notes and scans of all such patients scanned for recurrent lower limb varicosities in a 36-month period between December 1997 and November 2000.

All the scans were performed with the patients in the standing position by a senior vascular technician using an

Table 1 Site of recurrence

Site of recurrence	Number of cases (%)
Groin	141 (65)
Thigh perforator	37 (17)
Calf perforator	19 (9)
SPJ/SSV	19 (9)

SPJ, saphenopopliteal junction; SSV, short saphenous vein.

ATL HDI 5000 (Advanced Technology Laboratory Ltd, Letchworth, UK) ultrasound machine using a 5–12 MHz linear array probe. The results of each scan were displayed diagrammatically (see Fig. 1) with an accompanying text report detailing sites of incompetence and retrograde flow.

These scans were reviewed retrospectively to identify the cause of the recurrence. In those cases where a recurrence in the groin was to blame, the cause was further specified into one of the following categories – a recurrent long saphenous vein (LSV), a persistent LSV or a medial tributary, with or without neovascularisation. These findings were confirmed by reading the operation note for the groin re-exploration.

Results

In the 36-month period, 186 patients (143 female, 43 male) totalling 216 limbs were scanned for recurrence. The average age was 50 years (range, 25–80 years). All had previously undergone surgical treatment of their varicosities. Time to recurrence from primary surgery varied between 9 months and 52 years but unfortunately data were not available in all cases. Approximately half of the patients had their first surgery at our hospital. The sites of recurrence are shown in Table 1. Those recurrences in the groin were further subdivided into their respective causes, which are shown in Table 2 along with a breakdown of type of primary surgery for each group. Of the lateral recurrences, 87% had been stripped at first surgery, whereas only 58% of LSV recurrences had been stripped and 33% had only been ligated. In the majority of cases, neovascular connections between the deep and superficial systems in the groin were not identified either on duplex scanning or at operation. Overall, 4 of 43 LSV recurrences,

Table 2 Causes of groin recurrence and type of primary surgery

Causes of groin recurrence	Number of cases (%)	Primary surgery		
		S	L	U
Lateral accessory saphenous vein	61 (43)	53	8	0
Residual main LSV	43 (30)	16	14	3
Medial tributary	22 (16)	16	4	2
Neovascularisation alone	15 (11)	11	2	2

S, LSV stripped; L, LSV ligated but not stripped; U, unknown primary procedure.

4 of 22 medial tributary recurrences and 4 of 61 lateral accessory saphenous recurrences had evidence of neovascularisation.

Thus, 61 of 141 (43%) groin recurrences were due to a lateral recurrent branch (*i.e.* the lateral accessory saphenous vein) and, as such, was the commonest cause of recurrent varicose veins encountered in this study.

Discussion

It is not disputed that recurrent varicose veins present an increasingly large burden to departments of vascular surgery, but little else such as recurrence rates, optimal treatment and the cause of recurrence seems to have been decided.

The published rates of recurrence vary between 7–65%,^{2,3} with about 70% recurring in the groin⁸ which is broadly similar to our series (65%). This reflects the huge variation in practice in primary varicose vein surgery and variations in study design and duration of follow-up. Flush ligation of the saphenofemoral junction (SFJ) and stripping of the LSV is the standard operation in most European centres with studies showing reduced rates of recurrence after stripping.⁹ Conversely, Japanese¹⁰ and US¹¹ studies have reported large series with low recurrence rates after SFJ ligation and sclerotherapy alone. In the face of such divergent opinions, it is perhaps not surprising that the cause of recurrence in these cases remains undecided.

Recurrent varicose veins can broadly be divided into two groups. First recurrence may occur in the main saphenous system, be it long or short (*i.e.* connections to a residual main stem, the SFJ or saphenopopliteal junction (SPJ)); or second, as an isolated perforator recurrence. To some extent, isolated perforator recurrences are difficult to abolish but may be helped by adequate stripping at primary surgery.¹² Recurrent varicose veins following failure at the original procedure adequately to isolate all tributaries, strip the main saphenous trunk or trunks and flush ligate the SFJ or SPJ should be considered a surgical failure and, as such, is preventable by an accurate and careful initial dissection. The causative reasons for inadequate surgery in the groin have been much debated. It is clear that the rate of recurrence varies inversely with the seniority of the surgeon performing the procedure;⁷ as this unglamorous operation was in the past often left to unsupervised juniors, it was hardly surprising that recurrence rates were high. The technical inadequacies of inexperienced surgery are compounded by a highly variant anatomy. A Korean cadaveric study¹³ demonstrated that the 'textbook' arrangement of venous tributaries in the groin occurred in only 23% of limbs – it is thus easy to see why junior surgeons may allow themselves to believe

Figure 2 Left saphenofemoral junction showing the medial accessory saphenous vein branching much further distally than the lateral. The other tributaries of the SFJ have been omitted for clarity.

erroneously that they have cleared all tributaries at the SFJ. This same Korean study also showed that the lateral accessory saphenous vein joins the LSV directly in only 67% of cases; in the remainder, it joins the femoral vein either alone or with another groin tributary.

Neovascularisation has been proposed as the commonest cause of groin recurrence.⁵ These tiny serpentine veins have been demonstrated both radiologically¹⁵ and histologically¹⁶ in many cases of groin recurrence and, in our experience, occurs more commonly in groins that had a significant haematoma at first surgery. This is perhaps not surprising as angiogenesis is a natural part of haematoma resorption and wound healing.

Whilst it is easy to imagine neovascularisation connecting the femoral vein to the end of an *in situ*, but disconnected, LSV or tributary, it is harder to visualise how this happens after vein stripping. Additionally, interposition techniques using both natural and synthetic patches have not been shown to be consistently effective^{17,18} – suggesting that perhaps neovascularisation is not the sole contributor to groin recurrences.

So why does the lateral accessory tributary recur so much more often than its medial counterpart? The answer may lie in the anatomical arrangements of the venous tributaries in the groin. The LASV is a virtually constant tributary that often receives one or more of the lateral abdominal tributaries (superficial epigastric and superficial iliac circumflex veins) before joining the SFJ.¹⁹ These

represent the 'northbound' branches found if the LASV is followed to its first branching point beyond the fossa ovalis (Fig. 2). It is often comparable in size to the main saphenous vein and the inexperienced may indeed mistake one for the other. The medial accessory saphenous vein, however, is a much less constant vein²⁰ and when present is usually without proximal tributaries.¹⁹ If the LASV is divided close to the SFJ and not traced for a sufficient distance to identify and individually ligate the inferiorly and superiorly running branches, we suggest that this represents a particular form of inadequate surgery which leaves several significant veins in close proximity to the SFJ and predisposes to thigh recurrence. By its inconstancy and lack of proximal branches this is a problem with the medial accessory saphenous vein less commonly. With this in mind, we suggest that the LASV should always be specifically looked for in groin exploration, cleared to its branching points and the inferiorly running branch avulsed or stripped to reduce the risk of groin recurrence.

Our study confirms that a major cause of groin recurrence is the presence of this lateral tributary which is either not discovered at primary surgery or is dealt with inadequately.

Conclusions

The persistence of the lateral accessory saphenous vein was the commonest cause of groin recurrence of varicose veins in our series. It should be looked for specifically by pre-operative duplex assessment and during groin exploration, both at initial surgery and at any subsequent operations for recurrence, bearing in mind that it will join the femoral vein directly in one-third of cases. The next step would be a randomised trial of stripping/avulsion of the LASV to address further its impact on reducing recurrence rates after varicose vein surgery.

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