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Pelvic venous reflux is a major contributory cause of recurrent varicose veins in more than a quarter of women

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Background: **Leg varicose veins are associated with pelvic venous reflux in approximately 20% of women who have had children. However, most venous units do not routinely look for pelvic venous reflux or treat it. We aimed to investigate what proportion of patients with recurrent varicose veins and a history of open surgery have pelvic venous reflux as a major contributing cause of their recurrence.**
Methods: **A retrospective study was performed of all patients referred in the previous year with recurrent varicose veins or venous reflux disease who had previously had open surgery performed elsewhere. All patients had routine lower limb venous duplex ultrasonography, and those found to have reflux of pelvic origin underwent transvaginal duplex ultrasonography. Each case was assessed by a consultant vascular surgeon, and the major cause (or causes, if more than one) of the recurrent varicose veins was noted.**
Results: **A total of 109 patients with recurrent varicose veins in 172 legs were analyzed (mean age, 53.9 years; female-to-male ratio, 97:12). Patients were divided into four groups: group 1, all patients; group 2, female patients; group 3, female patients with children; and group 4, female patients with children who had not had hysterectomy. Pelvic venous reflux was found to be a major contributing cause of recurrent varicose veins in 44 of 172 legs (25.6%). This rose to 43 of 154 legs (27.9%) in group 2, 40 of 131 legs (30.5%) in group 3, and 37 of 111 legs (33.3%) in group 4.**
Conclusions: **Pelvic venous reflux is a major contributing cause of recurrent varicose veins after open surgery that has rarely been reported previously. In view of this finding, we suggest that a duplex ultrasound protocol, incorporating a transvaginal duplex examination of the ovarian and internal iliac veins, be adopted for the investigation of pelvic venous reflux in female patients presenting with symptomatic leg varicose veins with duplex-observed reflux entering the leg vein pattern from the pelvis. In the event that it is found, we suggest that treatment and resolution of this source of venous reflux be considered before any intervention for the leg varicose veins, surgical or otherwise. (J Vasc Surg: Venous and Lym Dis 2014;2:411-5.)**

Varicose veins are known to occur in approximately one third of adults, both men and women.[1] Traditional surgical procedures aiming to treat leg varices, such as stripping of the great saphenous vein, are associated with incredibly high long-term recurrence rates.[2,3] To try to reduce these, it is necessary to understand why varicose veins recur after surgery. One avenue of investigation is to identify what the common patterns of recurrence are after vein surgery.

Many studies have been published about the patterns of recurrence, and most seem to identify common causes. Failure to strip the great saphenous vein after a high tie has been proved to lead to higher recurrence rates.[4,5] It is also not uncommon for surgeons to provide inadequate treatment because of either inexperience[6,7] or a failure to correctly identify and treat the anterior accessory saphenous vein.[8] However, recurrence rates are still unacceptably high even if these procedures are correctly performed in conjunction, and this is in part due to neovascularization. Neovascularization of previously stripped veins occurs in around 23% to 29% of patients after 1 year[9,10] and 52% after 2 years,[11] meaning that varices return in most patients treated with traditional surgical methods. Finally, despite the highly controversial nature of the topic, research has shown that incompetent perforator veins can lead to recurrent varicose veins,[12-14] although this issue is often the topic of heated debate.

In spite of the vast amount of literature on the subject of recurrence, pelvic venous reflux and reflux into leg varicose veins, usually through paravulval veins, is rarely identified in English-language publications as a cause. This is surprising as it has previously been acknowledged that pelvic venous reflux with extension into the varicose veins in the legs is one of the causes of leg varicose veins in approximately 17% of women.[15]

Although many authors have reported and discussed cases of pelvic venous reflux, there seems to be a nearly total focus on the ovarian veins alone. Whereas there are a few studies acknowledging the significance of incompetent internal iliac veins,[16,17] the clinical relevance of reflux in this remains largely unrecognized.

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This study is a retrospective review of a cohort of patients with recurrent varicose veins who had been referred to an independent, specialist vein unit in the United Kingdom after open surgical saphenofemoral ligation and attempted truncal stripping of the great saphenous vein elsewhere. The aim of this study was to identify all the major causes of reflux in these patients contributing to the recurrent varicose veins, including any pelvic venous reflux.

METHODS

The study sample was selected by performing a search of our patient database of patients who had been referred in the previous year with recurrent varicose veins and who had had their full investigations completed. This study was approved by the Institutional Review Board. As a retrospective study, patient consent was not required by the United Kingdom's Health Research Authority.

All patients referred with recurrent varicose veins underwent a clinical examination by a consultant at the clinic and had a full venous duplex ultrasonographic examination of their legs by one of three specialist vascular technologists specializing in venous disease. All female patients with recurrent varicose veins who were found on venous duplex ultrasound examination to have venous reflux emerging from the pelvis into the recurrent varicose veins of the legs were offered a transvaginal duplex ultrasound scan (TVS) to identify the source of the venous reflux.

The method of performing TVS has been developed during the last 15 years in our clinic and has been refined as the Holdstock/Harrison protocol.[18] It is used for the assessment of pelvic vein reflux and for gauging the severity and extent of the reflux pattern. It is performed with the patient in a 45-degree head-up position. The full technique is described elsewhere,[18] but the key points looked for are the following:

1. Reflux >1 second within venous trunks. The reflux should last until the end of the Valsalva maneuver.
2. The trunk diameter is generally >5 mm, but smaller trunks with persistent reflux can be considered if other factors listed here are present.
3. The venous trunks should exhibit dilation on the Valsalva maneuver in addition to reflux.
4. There may be contralateral dilation and siphon effects between right and left ovarian veins and right and left internal iliac veins or ipsilateral siphon between the ovarian and internal iliac trunks.
5. Associated varices should show distention and flow reversal on the Valsalva maneuver.

All patient notes and sonographic findings were reviewed by the investigators, and all sources of duplex-identified venous reflux were documented along with the clinical, etiologic, anatomic, and pathologic (CEAP) score of the leg in question. Each patient record was subsequently analyzed, and the different sources of reflux were classified by the pattern of venous reflux and whether this correlated with the clinical findings of recurrent varicose veins or skin damage. Reflux was categorized as follows:

- Major cause of recurrence: if the reflux led directly into the recurrent varicose veins or area of skin damage
- Contributory cause of recurrence: if there was another major cause, but this reflux added to the major pattern of reflux leading into the recurrent varicose veins or area of skin damage
- Coincidental venous reflux: if venous reflux was found that was of no clinical significance and not related to the clinical problem

Once all of the venous reflux in these patients with recurrent varicose veins had been classified, we then ignored the coincidental venous reflux as it was not contributory to the clinical problem and did not require any treatment. Only four patients were excluded with venous reflux coming from the pelvis into the legs, which duplex examination showed to be minor and not connected with the recurrent varicose veins. All of these patients showed no truncal venous reflux on TVS and only minor reflux in paravulvar veins. Therefore, we analyzed the pattern of recurrent reflux in patients with clinical recurrent varicose veins or recurrent venous reflux disease in terms of their major and contributory causes of recurrence. In many patients, more than one cause was identified. Patients were then split into four groups: group 1, all patients with recurrent varicose veins; group 2, all female patients; group 3, all female patients who had had children; and group 4, all female patients who had had children and who had not undergone subsequent hysterectomy.

As this was a retrospective study, the "hysterectomy" reported by patients and causing their exclusion from group 4 might have been any number of operations from simple subtotal hysterectomy to total abdominal hysterectomy with bilateral salpingo-oophorectomy. We were not able to find out the operative details in the majority of cases. However, because this is a potential confounding variable, as these patients might have had a ligation of their ovarian veins as part of their gynecologic surgery, by excluding them we are more likely to see in group 4 the underlying association between pelvic vein reflux feeding refluxing blood into recurrent varicose veins in women who have had children.

The major and contributory causes of recurrent venous reflux were then analyzed for these four groups of patients.

RESULTS

A total of 109 patients, 12 men and 97 women, with 172 legs showing recurrent varicose veins were identified and included in the study (mean age, 53.9 years; range, 30-84 years). The mean follow-up time between the patient's original failed treatment and examination at a specialist vein unit ranged from 6 months to 50 years, with a mean of 15.9 years. The clinical severity of venous reflux observed in all patients was classified by the CEAP system. Uncomplicated varicose vein (C2) was noted in