Original Article

# Assessment of Causes and Patterns of Recurrent Varicose Veins After Surgery

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## Abstract

**Background:** Varicose vein surgery is characterized by high recurrence rate of 60% after 5 years of follow-up observation, and this is a disappointing finding, both for the patient and surgeon. **Aim:** To identify the possible causes and patterns of recurrent varicose veins. **Materials and Methods:** 92 patients with recurrent varicose veins were enrolled in this study. Full detailed history, examination, and investigations were done. **Results:** 30 patients had recurrence after saphenofemoral disconnection, 22 patients with recurrence after saphenofemoral disconnection and stripping below knee, 28 patients recurrence after saphenofemoral disconnection with stripping above knee and 12 patients recurrence after sapheno-popliteal disconnection with stripping. The double great saphenous veins, neovascularization and deep venous thrombosis before and after surgery were the most observed patterns of recurrence. The anatomical patterns of recurrence were more in leg then both leg and thigh pattern. **Conclusion:** Saphenofemoral ligation with below knee stripping has the least frequency of recurrence, while Trendlenberg operation alone has the highest.

**Keywords:** Causes, Patterns, Recurrence, Varicose veins

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## Introduction

Varicose veins whether primary or secondary are common surgical problem, the prevalence has been variously reported from as little as 2% to over 60% in population studies.[1,2] There are many complications following varicose veins surgery. Most complications, other than sensory disturbance and recurrence are relatively uncommon.[3] Varicose vein surgery is characterized by a high recurrence rate of 20%-60% after 5 years and even higher after longer periods of follow-up observation and recurrence may be due to several causes: inaccurate initial diagnosis, progression of disease, inadequate initial surgery, altered venous dynamics and neovascularization.[4] Recurrence has been attributed to neovascularization in the granulation tissue around stump of great or short saphenous veins[5] or to the development of incompetence in pre-existing collateral, which had not been adequately ligated by the previous surgeon.[6]

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Attention to technical details will decrease the regrettably high rate of recurrence after sapheno-femoral disconnection and render safer exploration. Early postsurgical recurrence results from an incomplete operation, late recurrence after correct surgery is due to deterioration of the remaining superficial venous system or in case of inappropriate surgery.[5] The ultrasonic marker of recurrent lower limb varicose veins was the re-emergence of dilated saphenous and perforating veins, as well as valve apparatus failure in the operated leg. Ultrasound study is the most rational method for screening diagnosis in case of abnormal veins of the lower extremities in the postoperative period.[7]

The aim of this study was to identify the possible causes and patterns of recurrent varicose veins lower limbs in patients with history of varicose veins surgery.

## Materials and Methods

Written consents were obtained from all patients before

the study. The steps of the study; the aims and the potential benefits were discussed with each individual patient. The patient had the right for withdrawal from the study at any time with neither jeopardizing his right to be treated nor affecting the relationship between the patient and the care provider.

Our descriptive prospective study was carried out on ninety two patients over 36 months from December 2006 to November 2009 with history of previous varicose veins surgery at the outpatient clinic to assess the possible causes of recurrent varicose veins after surgery and different patterns of recurrence.

All patients of both sexes regardless to age with recurrent varicose veins with history of previous varicose veins surgery at the same limb were included. We excluded patients who were missed during the follow-up period.

Full detailed history, examination and duplex ultra sound was made over the superficial and deep venous system of patients of this study.

Sample was taken as all patients with recurrent varicose veins after previous varicose veins surgery in outpatient clinic.

### Statistical analysis

Data entry and analysis were accomplished using windows operating system and the based statistics program (SPSS 10.0) adopting in the outcome the following statistical tests:

1. Continuous variables are expressed as means.
2. Discrete variables are expressed as frequencies and percentages
3. Differences were considered statistically significant if probability (*P* value ≤ 0.05), it was calculated using epi-info statistical package 11.0 programs.

Presentation of the statistical outcome in form of tabulation and graphs were accomplished by windows-based Microsoft Excel.

## Results

Sixty patients out of 92 patients were females (65.2%) and 32 patients were males (34.8%) and their age distribution was shown in [Table 1]. Thirty patients (32.6%) had recurrence after saphenofemoral disconnection (Trendelnberg operation), 22 patients (23.9%) had recurrence after Saphenofemoral disconnection, with stripping below knee (truly below knee), 28 patients (30.4%) had recurrence after saphenofemoral disconnection with stripping above knee and 12 patients (13.1%) had recurrence after Sapheno-popliteal disconnection with stripping.

Regarding the pattern of recurrence, 14 patients (15.2%) had double long saphenous, 2 patients (2.1%) had double short saphenous, 24 patients (26%) had recurrence due to neovascularization, 34 patients (36.9%) had deep venous thrombosis before and after surgery and 18 patients (19.8%) have incompetent surgery through the wrong site of incision or the performance of non specialized surgeon in the field [Table 2]. Recurrence was classified regarding the patients' jobs as 28 patients (30.4%) housewives, 32 patients (34.8%) teachers, 20 patients (9.3%) workers, 4 patients (4.3%) officers and 8 patients (8.7%) employees. Table 3 showed the different anatomical patterns of recurrence in our study. The authors studied the relationship between the operations performed and the post-operative recurrence for 2 years, 2-5 years, 6-10 years and more 10 years and the detailed description was noted in [Table 4].

Regarding the Duplex findings in our study, there are 24 patients (26.1%) with incompetent perforators in the thighs, 14 patients (15.2%) with incompetent perforators in the legs, 30 patients (32.6%) with incompetent

**Table 1: Age distribution in the study group**

| Age groups | No. | % |
|---|---|---|
| 20-29 | 8 | 8.7 |
| 30-39 | 24 | 26.1 |
| 40-49 | 28 | 30.4 |
| 50-56* | 32 | 34.8 |
| Total | 92 | 100 |
| Mean age | | 36.5±9.4 |

*Results are statistically significant as *P* value ≤ 0.05

**Table 2: The distribution of the patients of the study group regarding the possible causes of recurrence**

| Causes of recurrence | No. | % |
|---|---|---|
| Double long saphenous | 14 | 15.2 |
| Double short saphenous | 2 | 2.1 |
| Neovasculerization* | 24 | 26 |
| Inadequate assessment DVT preoperative (incomplete recanalization)** | 34 | 36.9 |
| Incompetent surgery | 18 | 19.8 |
| Total | 92 | 100 |

*Results are statistically significant as *P* value ≤ 0.05; **Results are statistically highly significant as *P* value ≤ 0.01

**Table 3: The different patterns of recurrence**

| Pattern of recurrence | No. | % |
|---|---|---|
| Inguinal | 4 | 4.3 |
| Thigh only | 20 | 21.7 |
| Popliteal fossa | 8 | 8.7 |
| Legs only | 38 | 42.3 |
| Both thigh and legs | 22 | 23 |
| Total | 92 | 100 |

**Table 4: The relationship between the operations performed for the patients of the study before recurrence and the postoperative recurrence duration**

| Operation performed | Saphenofemoral disconnection without stripping (Trendlenberg operation) | | Saphenofemoral disconnection with stripping below knee | | Saphenofemoral disconnection with stripping above knee | | Saphenopopliteal disconnection with stripping | |
|---|---|---|---|---|---|---|---|---|
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) |
| Less than 2 years | 2 | 6.7 | 0 | 0 | 2 | 7.1 | 0 | 0 |
| 2-5 years | 6 | 20 | 0 | 0 | 4 | 14.2 | 2 | 16.6 |
| 6-10 years | 20 | 66.6 | 2 | 9.1 | 4 | 14.2 | 6 | 50 |
| More than 10 years | 2 | 6.7 | 20 | 90.9 | 18 | 64.5 | 4 | 33.4 |
| Total | 30 | 100 | 22 | 100 | 28 | 100 | 12 | 100 |

* Results are statistically significant as *P* value ≤ 0.05

perforators in both thigh and leg, and 24 patients (26.1%) without incompetent perforators. Nonspecialized surgeons operations came with 58 patients (63.5%) recurred whereas those of specialized ones brought about a recurrence of 34 patients (36.5%).

## Discussion

There are few epidemiological data specifically relating to recurrent varicose veins and the published retrospective studies are not easy to compare because of differences in the definition of recurrence, differences in the initial treatment, the classification of recurrences and the method and duration of follow-up.[1,3] Previous studies reported the highest frequency of recurrence was in the age between 40 and 49 and the least age of recurrence was 20-29 years.[6,8] Our data came in agreement with these studies but with slight increase of age (50-56 years) in the highest frequency of recurrence. This slight increase may be due to the fact that more than 34% of our patients were above 50 years old.

Causes of recurrence are multiple, as there are many anatomical variations as double short saphenous, double long saphenous, neovascularization or deep venous thrombosis preoperative. Many investigators published their studies about the cause of recurrence with nearly comparable incidence, but incomplete surgery still an important cause in all studies.[9-11] The recurrence is an avoidable complication of a imperfect primary surgery.[12] Our data came in agreement with these studies[9-11] regarding neovascularization and incomplete surgery as both showed the highest points of recurrence in our series. An important recent study reported that recurrence after primary varicose vein surgery is associated with inadequate primary surgery or progression of disease, and neovascularization alone is not a cause of recurrent varicose veins.[13]

The associations between occupational characteristics, gender differences and symptoms of varicose veins contribute to knowledge of gender-specific occupational risk factors in such patients.[14] Prolonged standing is one of the main factors which can precipitate varicose veins and it is also one of the main factors of recurrence due to increase venous pressure especially in diseased venous valves. More than 65% of our patients were house wives and teachers that came in concordance with other studies.[3,10] Regarding the anatomical site our study, like others[8] showed the least recurrence was inguinal pattern (4.3%), and the highest was in the legs and 22 patients (42.3%).

The relation between the type of operation and the duration between the surgery and recurrence is very important by which we can reach to the method which can avoid or decrease the higher incidence of recurrence. The saphenofemoral disconnection without stripping showed a higher recurrence rate up to 20% with short (within 2 years) or 66.6% with long (from 6-10 years) follow up period when compared with saphenofemoral disconnection and below knee stripping whose recurrence rate was 0% and 9.1% respectively.[1,3,4]

The presence of incompetent perforators is also one of the risk factors of recurrence especially if not ligated during the 1st surgery as it may be responsible for dilatation and incompetence of the superficial venous system. In our study, only 26.1% of patients hadn't incompetent perforators while other studies[3,11] showed only 18.3% and 21% had not incompetent perforators. It was stated that varicose veins recurred despite technically correct surgery confirmed on post-operative duplex ultrasonography. The likelihood of recurrence increased in the presence of SSV reflux, perforating vein incompetence and post-thrombotic deep vein incompetence.[15]

The specialty of the surgeon is may play a role in recurrence as there are many errors occurred during the surgical procedure as the site of incision must be at the crease to avoid excess fat, which can lead to miss branches of the saphenofemoral or saphenopopliteal junction and lead to incompetent surgery.[16,17] In literatures, many

investigators stressed on the non-specialized surgeon as a factor of recurrence.[1,3,18,19] Nearly, all of these studies reported the same incidence of recurrence in case of non-specialized surgeons 59.2%[1,18] to 70%.[3] In our study 58 patients (63.5%) were operated by general surgeons, while 34 patients (36.5%) were operated with vascular surgeons.

Duplex scanning can provide the necessary anatomical and functional information about the nature of recurrence and has become the investigation of choice in patients with recurrent varicose veins, also inadequate preoperative assessment in presence of deep venous thrombosis is one of the most common cause of recurrence, in addition to this, incompetent surgery of the wrong site of incision containing excess fat lead to incomplete ligation of all tributaries of the superficial system.[20]

Also the preoperative Duplex ultrasound assessment is important which may lead to true diagnosis or false one as assessment of incompetent valves at the saphenofemoral and saphenopopliteal junctions and the perforators and also the patency of the deep venous system and absence of thrombosis.

## Conclusion

It was concluded that recurrent varicose veins after surgery is a common problem which has different causes as anatomical variation between person and other which is need good assessment by clinical and radiological procedure as Duplex ultrasound, and also there is another cause of recurrence as neovascularization also inadequate assessment preoperative as presence of deep venous thrombosis is one of the most common cause of recurrence and also incompetent surgery as wrong site of incision which may be away from the inguinal crease which contain excess fat lead to incomplete ligation of all branches of the superficial system.

## References


1. Robertson L, Evans C, Fowkes FG. Epidemiology of chronic venous disease. Phlebology 2008;23:103-11.
2. Beebe-Dimmer JL, Pfeifer JR, Engle JS, Schottenfeld D. The epidemiology of chronic venous insufficiency and varicose veins. Ann Epidemiol 2005;15:175-84.
3. Kostas T, Ioannou CV, Touloupakis E, Daskalaki E, Giannoukas AD, Tsetis D, *et al*. Recurrent varicose veins after surgery: A new appraisal of a common and complex problem in vascular surgery. Eur J Vasc Endovasc Surg 2004;27:275-82.
4. Allaf N, Welch M. Recurrent varicose veins: Inadequate surgery remains a problem. Phlebology 2005;20:138-40.
5. Geier B, Olbrich S, Barbera L, Stücker M, Mumme A. Validity of the macroscopic identification of neovascularization at the saphenofemoral junction by the operating surgeon. J Vasc Surg 2005;41:64-8.
6. Creton D. Surgery for recurrent saphenofemoral incompetence using expanded polytetrafluoroethylene patch interposition in front of the femoral vein: Long-term outcome in extremities. Phlebology 2002;16:93-7.
7. Tatarchuk AN. Capacities of ultrasound study in a follow-up of patients with lower extremity varicose veins after phlebectomy. Vestn Rentgenol Radiol 2011;1:22-5.
8. van Rij AM, Jones GT, Hill GB, Jiang P. Neovascularization and recurrent varicose veins: More histologic and ultrasound evidence. J Vasc Surg 2004;40:296-302.
9. Stonebridge P, Chalmers N, Beggs I. Recurrent varicose veins: A varicographic analysis leading to a new practical classification. Br J Surg 1995;82:60-2.
10. Fischer R, Chandler JG, De Maeseneer MG, Frings N, Lefebvre-Vilarbedo M, Earnshaw JJ, *et al*. The unresolved problem of recurrent saphenofemoral reflux. J Am Coll Surg 2002;195:80-94.
11. Winterborn R, Foy C, Earnshaw J. Causes of varicose vein recurrence: Late results of a randomized controlled trial of stripping the long saphenous vein. J Vasc Surg 2004; 40:634-9.
12. Pourhassan S, Zarras K, Mackrodt HG, Stock W. Recurrent varicose veins. Surgical procedure-results. Zentralbl Chir 2001;126:522-5.
13. Bahk JW, Kim H, Jung-Choi K, Jung MC, Lee I. Relationship between prolonged standing and symptoms of varicose veins and nocturnal leg cramps among women and men. Ergonomics 2011. [In press].
14. Theivacumar NS, Darwood R, Gough MJ. Neovascularisation and recurrence 2 years after varicose vein treatment for sapheno-femoral and great saphenous vein reflux: A comparison of surgery and endovenous laser ablation. Eur J Vasc Endovasc Surg 2009;38:203-7.
15. Allegra C, Antignani PL, Carlizza A. Recurrent varicose veins following surgical treatment: Our experience with five years follow-up. Eur J Vasc Endovasc Surg 2007;33:751-6.
16. De Maesenee MG. The role of postoperative neovascularisation in recurrence of varicose veins: From historical background to today's evidence. Acta Chir Belg 2004;104:283-9.
17. Joshi D, Sinclair A, Tsui J, Sarin S. Incomplete removal of great saphenous vein is the most common cause for recurrent varicose veins. Angiology 2011;62:198-201.
18. Perrin M, Allaert F. Reproducibility of the recurrent varicose veins after surgery (REVAS) classification. Eur J Vasc Endovasc Surg 2006;5:35-45.
19. Creton D. A nondraining saphenous system is a factor of poor prognosis for long-term results in surgery of great saphenous vein recurrences. Dermatol Surg 2004;30:744-9.
20. Englund R. Duplex scanning for recurrent varicose veins. Aust N Z J Surg 1996;66:618-20.


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