Anterior Accessory Great Saphenous Vein: Common Cause of Recurrent Varicose Veins

Original Article

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ABSTRACT

Background: Varicose veins are a prevalent vascular condition affecting a significant portion of the population. Recurrence after surgical treatment is a common concern. often attributed to the presence of an incompetent anterior accessory great saphenous vein (AAGSV). This research elucidated and evaluated the impact of AAGSV reflux as a significant cause of recurrent varicose veins in the lower limbs.

Patients and Methods: This observational, retrospective study analyzed 80 patients with varicose. Preoperative duplex ultrasound, clinical examination, and demographic data were collected. Patients underwent various treatment modalities, and recurrence rates, sites, and associated symptoms were evaluated.

Results: The mean age was 43.4 ±9.59 years, with a higher proportion of females (61.25%). Preoperatively, 65% had anterior saphenous vein involvement, with a mean diameter of 4.4±1.25 mm. The most common site of recurrence was the AAGSV (37.5%), followed by the great saphenous vein (21.25%). The mean time to recurrence was 2.4±0.76 years, with symptoms like visible varicosities (88.75%), edema (31.25%), and pain (27.5%). Procedures after recurrence were predominantly Endovenous laser ablation (71.25%), followed by surgery (26.25%) and radiofrequency ablation (2.5%).

Conclusions: The AAGSV significantly contributes to recurrent varicose veins, emphasizing the importance of comprehensive preoperative assessment and appropriate treatment to improve patient outcomes.

Key Words: Anterior accessory great saphenous vein, recurrence, varicose veins.

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INTRODUCTION

Varicose veins, a widespread vascular condition affecting a significant portion of the population, have long been recognized as a prevalent health concern. Epidemiological studies have demonstrated a staggering prevalence rate of 2–73% of the population globally[1–3]. Varicose veins can progress for a variety of reasons, including age, sex, work, pregnancy, smoking, obesity, lack of exercise, heredity, and style of life[3,4].

Patients often hesitate to seek treatment due to the widely held belief that varicose veins inevitably recur after intervention[5]. However, appropriate management of varicose veins is essential for better quality of life and to prevent recurrence[6]. The treatment failure or recurrence can be attributed to various factors, including inaccurate diagnosis, inappropriate treatment approaches, neovascularization, and poor patient compliance[7].

One of the most significant contributors to recurrent varicose veins is the presence of an incompetent anterior accessory great saphenous vein (AAGSV)[8]. According to numerous studies, AAGSV reflux is considered the most common cause of varicose veins in the lower limbs and is a major contributing factor to recurrence when not addressed properly[9–12].

Comprehensive duplex ultrasound imaging plays a crucial role in the diagnosis of varicose veins, enabling the identification of reflux and obstruction within the deep and superficial venous systems[13,14].

AIM OF THE STUDY

The main objective of this research is to elucidate and evaluate the impact of AAGSV reflux as a significant cause of recurrent varicose veins in the lower limbs.

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PATIENTS AND METHODS

This was an observational, descriptive, retrospective study with an analytic component conducted on 80 patients of both sexes presenting with varicose veins at Mansoura University Hospitals, Egypt, between June 2020 and May 2023 and an additional 1-year follow-up.

ETHICAL COMMITTEE

The study protocol was approved by the Institutional Ethical Committee (R.24.02.2518.R1). The study was conducted following ethical approval and with informed consent from all participants. The study population consisted of patients with recurrence of varicose vein disease affecting the thigh, with or without involvement of the leg and foot.

Patients were included if they had de novo varicose veins with reflux at the saphenofemoral junction (SFJ), great saphenous vein (GSV), or both, with or without reflux in AAGSV, and recurrent cases by AAGSV.

Exclusion criteria were secondary varicose veins due to obstructive causes like deep vein thrombosis (DVT) or malignancy, as well as cases with reflux or incompetence of iliac veins or perforators unrelated to the AAGSV.

Consecutive sampling included all patients who met eligibility criteria and presented to the hospital during the study period. Written informed consent was obtained.

A detailed medical history was taken, including the onset, course, and duration of varicose veins, the presence of pelvic, thigh, or perineal varicosities, a history of hernia, hemorrhoids, exaggerated postcoital or menstrual pain, DVT, trauma, malignancy, previous surgery, and a family history of varicose veins or venous interventions.

A comprehensive clinical examination was performed, including inspection of the size, site, and pattern of varicosities in the affected limb, abdominal wall for visible veins or hernias, pelvic, perineal, and thigh regions for varicosities, and the anus for hemorrhoids. Palpation assessed venous reflux and fascial defects. Auscultation was evaluated for bruits suggestive of arteriovenous fistulas and abdominal masses.

Duplex imaging assessed patency of the superficial and deep venous systems, incompetence or reflux at the SFJ, GSV, and AAGSV, absence of small saphenous vein pathology, synechiae or DVT remnants, incompetent perforators, and iliac vein obstruction.

Statistical analysis

Statistical analysis was done using SPSS v26 (IBM Inc., Chicago, Illinois, USA). Quantitative variables were presented as mean and SD, and qualitative variables were presented as frequency and percentage (%) (Fig. 1).

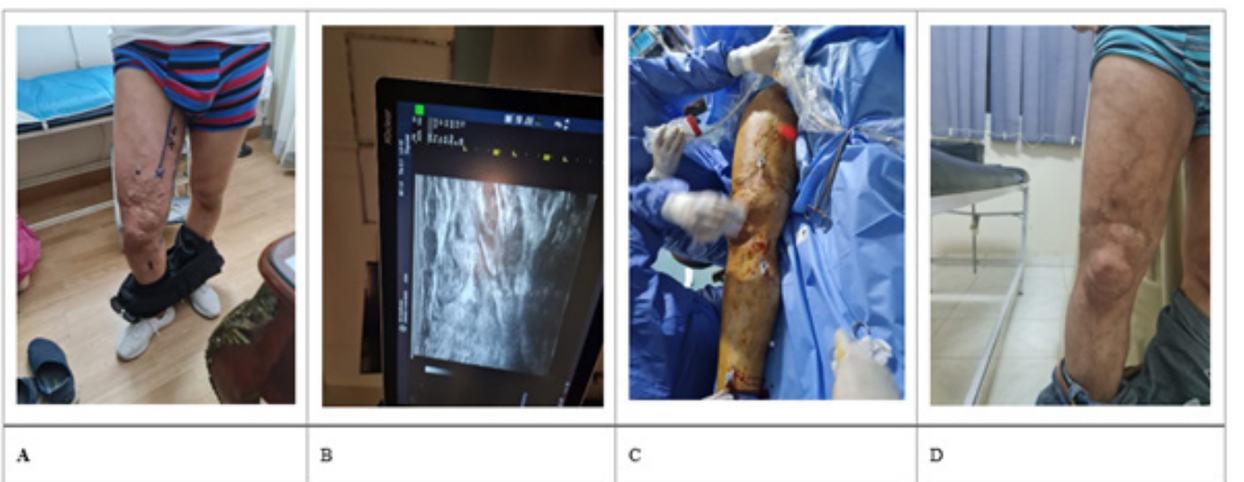

Fig 1: (a): Recurrent Varicose Veins with anterior accessory long saphenous vein. (b): Intraoperative venous duplex for anterior accessory long saphenous vein. (c): Endovascular laser ablation with multiple sheath techniques. (d): postoperative after laser ablation.

RESULTS

The mean age value (±SD) was 43.4 (±9.59) years. Sex was male in 31 (38.75%) patients and female in 49 (61.25%). BMI was normal in 31 (38.75%) patients, overweight in 28 (35%) patients and obese in 21 (26.25%) patients. Diabetes mellitus was present in 13 (16.25%) patients, cardiac disease was present in eight (10%) patients, and hypertension was present in 16 (20%) patients, (Table 1).

Table 1: Demographic data of the studied patients.

	(*n*=80)
Age (years)	43.4±9.59
Sex	
Male	31 (38.75)
Female	49 (61.25)
BMI	
Normal	31 (38.75)
Overweight	28 (35)
Obese	21 (26.25)
DM	13 (16.25)
Cardiac disease	8 (10)
Hypertension	16 (20)

Data are presented as mean±SD or frequency (%); BMI: body mass index; DM: diabetes mellitus.

Preoperative duplex findings were SFJ incompetence in 68 (85%) patients, SPJ incompetence in 7 (8.75%) patients, and anterior saphenous in 52 (65%) patients. Age's mean value (±SD) was 4.4 (±1.25) mm. The anterior saphenous location was anterior-lateral in all patients.

The pain was present in 11 (13.75%) patients. Visible varicosity was present in 70 (87.5%) patients. Ulcers were present in two (2.5%) patients. Pigmentation was present in six (7.5%) patients. Edema was present in 18 (22.5%) patients. Clinical, etiological, anatomical, and pathophysiological (CEAP) classification was II in 61 (76.25%) patients, III in 13 (16.25%) patients, IV in four (5%) patients, and VI in two (2.5%) patients (Table 2).

Table 2 Preoperative duplex findings and preoperative symptoms of the studied patients

Table 2: Preoperative duplex findings and preoperative symptoms of the studied patients.

	(*n*=80)
Preoperative duplex findings	
SFJ incompetence	68 (85)
SPJ incompetence	7 (8.75)
Anterior saphenous	52 (65)
Anterior saphenous diameter (mm)	4.4±1.25
Anterior saphenous location	
Anterio-lateral	80 (100)
Preoperative symptoms	
Pain	11 (13.75)
Visible varicosity	70 (87.5)
Ulcers	2 (2.5)
Pigmentation	6 (7.5)
Edema	18 (22.5%)
CEAP classification	
II	61 (76.25)
III	13 (16.25)
IV	4 (5)
VI	2 (2.5)

Data are presented as mean±SD or frequency (%).
CEAP, clinical (C), etiological (E), anatomical (A), and pathophysiological (P); SFJ, sapheno-femoral junction; SPJ, saphenopopliteal junction.

After recurrence, surgery was performed in 21 (26.25%) patients, endovenous laser ablation (EVLA) in 57 (71.25%) patients, and radiofrequency ablation in two (2.5%) patients. The recurrences were thigh perforator in five (6.25%) patients, GSV in 17 (21.25%) patients, AASV in 30 (37.5%) patients, medial accessory in eight (10%) patients, calf perforator in eight (10%) patients, SPJ in seven (8.75%) patients, and angiogenesis in five (6.25%) patients. The recurrence time's mean value (±SD) was 2.4 (±0.76) years. The pain was present in 22 (27.5%) patients. Visible varicosity was present in 71 (88.75%) patients. Ulcers were present in three (3.75%) patients. Pigmentation was present in six (7.5%) patients. Edema was present in 25 (31.25%) patients. CEAP classification was II in 52 (65%) patients, III in 22 (27.5%) patients, IV in one (1.25%) patie,nt and VI in five (6.25%) patients, (Table 3).

Table 3: Recurrence of the studied patients.

	(*n*=80)
Procedure after recurrence	
Surgery	21 (26.25)
EVLA	57 (71.25)
Radiofrequency ablation	2 (2.5)
Recurrence	
Thigh perforator	5 (6.25)
GSV	17 (21.25)
AAGSV	30 (37.5)
Medial accessory	8 (10)
Calf perforator	8 (10)
SPJ	7 (8.75)
Angiogenesis	5 (6.25)
Time of recurrence (years)	2.4±0.76
Symptoms of recurrence	
Pain	22 (27.5)
Visible varicosity	71 (88.75)
Ulcers	3 (3.75)
Pigmentation	6 (7.5)
Edema	25 (31.25)
CEAP classification	
II	52 (65)
III	22 (27.5)
IV	1 (1.25)
VI	5 (6.25)

Data are presented as mean±SD or frequency (%).
AAGSV, anterior accessory great saphenous vein; CEAP, clinical (C), etiological (E), anatomical (A), and pathophysiological (P); EVLA, endovenous laser ablation; GSV, great saphenous vein; SPJ, saphenopopliteal junction.

DISCUSSION

Varicose veins represent a common and often recurrent vascular condition with a multifactorial etiology, necessitating a comprehensive understanding of the underlying anatomical and pathophysiological factors contributing to disease progression and treatment failure[14–18].

The study population comprised 80 patients, with a mean age of 43.4±9.59 years, and a higher proportion of females (61.25%) compared with males (38.75%). This sex distribution aligns with the well-established epidemiological evidence that varicose veins are more prevalent in women, likely due to the influence of hormonal factors and pregnancy-related changes in venous hemodynamics[1,2,10,16].

Regarding BMI, most patients fell into the overweight (35%) and obese (26.25%) categories, while 38.75% had a normal BMI. This observation is consistent with numerous previous studies that have identified obesity as a significant risk factor for the development and progression of chronic venous disease (CVD), including varicose veins[10,16,18]. The increased intra-abdominal pressure associated with obesity can contribute to venous hypertension and valvular incompetence, exacerbating the development and recurrence of varicose veins.

Comorbidities, such as diabetes mellitus (16.25%), cardiac disease (10%), and hypertension (20%), were present in a subset of patients. These comorbidities are known to be associated with an increased risk of CVD, potentially due to the underlying pathophysiological mechanisms, including endothelial dysfunction, inflammation, and impaired venous return[10,11].

The preoperative duplex ultrasound findings revealed that the majority of patients (85%) exhibited SFJ incompetence, which is a common anatomical site for venous reflux and the development of varicose veins[7,8,10]. Notably, 65% of patients had anterior saphenous vein involvement, with a mean diameter of 4.4±1.25 mm, consistently located in the anterio-lateral position. The presence of AAGSV has been reported as a significant risk factor for varicose vein recurrence, as these veins can serve as alternative pathways for venous reflux and contribute to the development of new varicosities[9,13,15,17].

Common preoperative symptoms included visible varicosities (87.5%), edema (22.5%), and pain (13.75%), with a small proportion of patients presenting with ulcers (2.5%). The CEAP classification, widely used to assess the severity of CVD, revealed that most patients were categorized as class II (76.25%), indicating varicose veins without skin changes or edema. This finding is consistent with the relatively early stage of the disease in the study population[11,14,18,19].

The recurrence cases necessitated further interventions such as surgery (26.25%), EVLA (71.25%), and radiofrequency ablation (2.5%) combined with duplex guided injection foam sclerotherapy using Polidocanol.

These findings suggest a higher efficacy of EVLA in treating recurrent varicose veins, which is consistent with reports by *Alozai et al.*[20] and *Fink et al.*[21].

The most common site of recurrence was the AASV (37.5%), followed by the GSV (21.25%). These results were consistent with several previous reports[10–12]. Other recurrence sites included thigh perforators (6.25%), medial accessory veins (10%), calf perforators (10%), SPJ (8.75%), and angiogenesis (6.25%).

The mean time to recurrence was 2.4±0.76 years, which is consistent with the reported recurrence rates in the literature, ranging from 20 to 60% within 2–5 years after treatment[22,23].

Symptoms associated with recurrence included visible varicosities (88.75%), edema (31.25%), pain (27.5%), ulcers (3.75%), and pigmentation (7.5%). The CEAP classification revealed that most patients with recurrence were classified as class II (65%), followed by class III (27.5%), class VI (6.25%), and class IV (1.25%), indicating a progression of the disease in some patients. These findings align with previous studies[14,22–24].

This study had limitations, including the retrospective design, small sample size, single-center setting, lack of long-term follow-up, inclusion of multiple treatment modalities, failure to account for confounding factors, and absence of a control group.

CONCLUSIONS

AAGSV remains a major contributor to recurrent varicose veins in the lower limbs. The presence of anterior saphenous vein involvement was observed in 65% of patients preoperatively, and it was the most common site of recurrence (37.5%), followed by the GSV (21.25%). The mean time to recurrence was 2.4±0.76 years, accompanied by symptoms like visible varicosities (88.75%), edema (31.25%), pain (27.5%), ulcers (3.75%), and pigmentation (7.5%), impacting patients' quality of life. Comprehensive preoperative duplex ultrasound imaging, which revealed SFJ incompetence in 85% of patients, remains crucial for early recognition and appropriate treatment of AAGSVs, potentially reducing the risk of recurrent varicose veins.

CONFLICT OF INTERESTS

There are no conflicts of interest.

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