

## Thrombophlebitis Post Varicose Vein Surgery: To Treat or Not to Treat?

Hui Yin Lim<sup>1\*</sup>, Prahlad Ho<sup>1</sup>, Iman Bayat<sup>2</sup> and Frank S Hong<sup>1</sup>

<sup>1</sup>Department of Haematology, Northern Health, Epping, Victoria, Australia

<sup>2</sup>Department of Vascular Surgery, Northern Health, Epping, Victoria, Australia

\*Corresponding Author: Hui Yin Lim, Department of Haematology, Northern Health, Epping, Victoria, Australia.

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### Abstract

**Objectives:** Patients may present to their local general practitioners (GP) or emergency departments (ED) with limb oedema, lump and/or pain following varicose vein procedures. We aim to determine how these patients are managed and provide a brief overview of varicose vein procedures and the associated post-procedural thrombophlebitic complications.

**Methods:** GPs, ED physicians and haematologists were surveyed about their management approach using a case study of a patient presenting with left leg swelling and pain 6 days following left saphenofemoral junction ligation, great saphenous vein (GSV) stripping and stab avulsions, with an ultrasound report of extensive superficial thrombophlebitis throughout the course of left GSV. The survey was conducted electronically using an online survey platform and by paper.

**Results:** There were 115 responses from 52 general practitioners (45%), 31 emergency medicine physicians (27%) and 32 haematologists (28%) with marked heterogeneity in management seen across specialties. Almost half the responders prescribed anticoagulation, either prophylactic (n = 26), or therapeutic (n = 30). Eight (7%) chose aspirin while 32 chose no anticoagulation (27%) and the remaining 19 (17%) were unsure.

**Conclusions:** Limited superficial thrombophlebitis soon after varicose vein interventions is common and often expected. There is usually no role for anticoagulation unless there is evidence of deep venous thrombosis. Our survey showed that this post-operative phenomenon is not well known in the medical community, which leads to unnecessary treatment with anticoagulation. Further education to raise awareness amongst clinicians is required for patient safety.

**Keywords:** Varicose Vein Surgery; Superficial Thrombophlebitis; Foam Sclerotherapy; Endovenous Ablation; Anticoagulation

### Introduction

Varicose veins are common and can progress to more serious complications such as pain, itching, skin changes and ulceration. They are major causes of morbidity and can have significant impact on patients' health-related quality of life and healthcare costs [1,2]. Treatment for varicose veins have been shown to improve quality of life and are thought to slow progression of the disease [3]. The treatments range from compression stockings to minimally invasive interventional procedures such as ultrasound-guided foam sclerotherapy, endovenous laser ablation and radiofrequency ablation to standard surgery by high ligation and stripping of great saphenous vein (GSV). After varicose veins surgery, some patients may experience limb oedema, numbness, lumps and/or leg pain, and often present to their local general practitioners (GP) or emergency departments (ED). Our anecdotal experience is that there is significant heterogeneity in the management of these patients, including a significant number of patients receiving unnecessary anticoagulation.

To confirm our observation, we conducted a survey among clinicians from the three specialties most likely to be consulted by these patients (with the exception of Vascular Surgery): General Practice, Emergency Medicine and Haematology. We report the results of this survey and discusses the current management of thrombophlebitic complications post-varicose vein surgery.

**Method**

The survey comprising of two multiple-choice questions was conducted among general practitioners, emergency medicine physicians and haematologists (including registrars). The survey was conducted both electronically using an online survey platform and by paper, from November 2017 to December 2017. This study was approved by the Northern Health Human Research Ethics Committee (QI 15.2017).

The first question requires the responder to identify his/her specialty while the second is that of a real-life case study of a de-identified patient presenting to Emergency Department with left leg swelling and pain following high ligation and stripping of GSV (Box 1). The clinicians were requested to choose one out of five possible management options.

Case: Mr SM, a 67-year old man, presented with increasing left leg pain and swelling 6 days following varicose vein surgery (left saphenofemoral junction ligation, great saphenous vein stripping and multiple stab avulsions). A Doppler ultrasound was performed and showed extensive superficial thrombophlebitis throughout the entire course of the left great saphenous vein. There is no DVT.

Besides analgesia and routine follow up, would you initiate (one answer only)

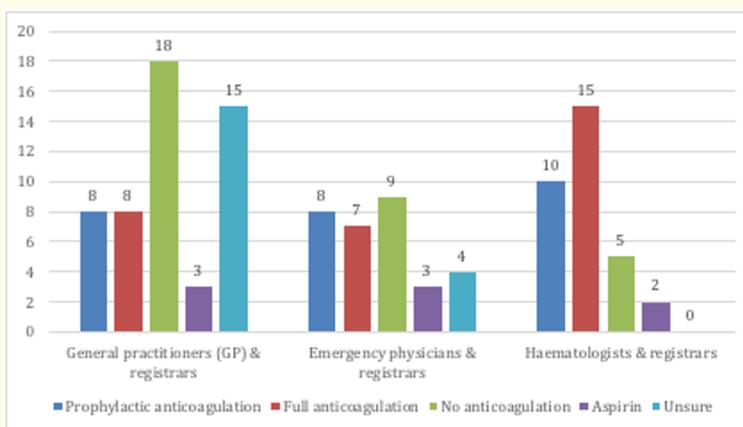
- a. Prophylactic anticoagulation with enoxaparin
- b. Full anticoagulation (e.g. with enoxaparin, warfarin)
- c. No anticoagulation
- d. Aspirin
- e. Don't know. I would seek advice from: \_\_\_\_\_

**Box 1:** The case study in the survey sent out to clinicians.

**Results**

A total of 115 responses were received from 48 GP (41.7%) and 4 GP registrars (3.5); 24 emergency medicine physicians (20.9%) and 7 emergency medicine registrars (6.1%); and 23 haematologists (20.0%) and 9 haematology registrars (7.8%).

There is marked heterogeneity in the clinicians' answers - 26 (22.6%) chose prophylactic anticoagulation, 30 (26.1%) chose therapeutic anticoagulation, 8 (7.0%) chose aspirin while 32 chose no anticoagulation (27.8%) (Figure 1). Of those who were unsure (n = 19; 16.5%), apart from three responders who did not indicate who they would consult, the remaining 14 (73.7%) would consult Haematology and only two would consult a vascular surgeon.



**Figure 1:** Preferred management options by clinicians' specialties.

The GP group had the highest proportion of choosing no anticoagulation (43%), and just over one-third of them (36%) are unsure how the patient should be managed. In the ED, similar numbers of clinicians would prescribe prophylactic anticoagulation, therapeutic anticoagulation or no anticoagulation. Interestingly, the haematologists and/or haematology registrars were four times more likely to recommend anticoagulation (either full or prophylactic dose) compared to their other colleagues (25/32 vs 31/83,  $p < 0.001$ ).

For this patient in particular, therapeutic anticoagulation with enoxaparin was initially commenced in Emergency Department. This was ceased at follow up at the Haemostasis and Thrombosis Clinic six weeks later following discussion with the treating Vascular team as it was not required. It was explained that the ultrasound findings were normal and common post-varicose vein surgery. The patient did not have any issues with venous thromboembolism at three months' follow up.

### Discussion

The principal superficial veins of the leg are the GSV and short saphenous vein (SSV) with GSV incompetence being the most common cause of chronic venous insufficiency. The National Institute for Health and Care Excellence (NICE) (2013) guideline for the diagnosis and management of varicose veins recommends referral to a vascular service if the patients have symptomatic primary or recurrent varicose veins; lower limb skin changes due to chronic venous insufficiency; superficial vein thrombosis and suspected venous incompetence; or venous leg ulcer [4].

Surgical junction ligation was previously the gold standard treatment for varicose veins. It has since been replaced by minimally invasive techniques with less morbidity and faster recovery times [5]. On the basis of cost effectiveness [6], the NICE guideline recommends that patients with confirmed varicose veins and truncal reflux should be offered endothermal ablation (radiofrequency or laser) of varicose veins or endovenous laser treatment of the GSV as first-line interventional treatment. If the patient was unsuitable for endothermal ablation, he/she should be offered ultrasound-guided foam sclerotherapy and if unsuitable, surgery would be the last option [4].

Even though surgery may have now been replaced by these minimally invasive procedure, it is important to note that post-procedure minor complications and symptoms are still prevalent. While the risk of deep vein thrombosis or pulmonary embolism is low and relatively comparable between radiofrequency ablation, surgery and laser treatment (0 - 3.5%) [7], varying degrees of phlebitis can develop following surgical, chemical or endovenous ablation of incompetent veins [8].

Endovenous ablation, designed to cause damage to the intimal wall of the vein, leads to obliteration of the lumen of the vessel by fibrosis. Phlebitis is a common complication of this procedure (5 - 10%) [9], if the amount of energy delivered was inadequate or above the static treated segment. Ablations are often performed approximately 2 cm distal to the saphenofemoral junction, leaving behind a short segment of GSV stump which can result in endovenous heat-induced thrombosis, with an incidence rate of 0 - 3% [8,10]. The presence of thrombotic material in the stump of the GSV generally do not require anticoagulation unless the thrombus protrudes into the deep venous system, typically the common femoral vein [8,11].

Sclerotherapy treatment induces phlebitis by destroying the lining of the affected vein with an irritant solution, causing irreversible damage to the intima of the vein and resulting in the complete obliteration of the involved vessel [12]. Inadequate obliteration leads to thrombosis without fibrosis and ultimately recanalisation, while excessive destruction leads to vascular dehiscence. A study of 126 patients following ultrasound-guided foam sclerotherapy reported the most frequently encountered complications to be skin staining (28%), superficial thrombophlebitis (18%) and pain (14%) and female gender was reported to be associated with post-procedure complications ( $p < 0.05$ ) [13].

Following surgical vein excision and phlebectomy, which involve the ligation of the affected vein and removal of varicosity, segments of patent varicose vein can be left behind while the residual end of an avulsed vein segment undergoes spasm and thrombosis. Superficial thrombophlebitis is therefore common along the course of the excised vein and is usually self-limiting [14]. In addition, surgery is reported to be associated with more swelling, inflammation, paraesthesia, bruising and haematoma [15].

Given how common varicose veins procedures are, patients would often present to their GP and local ED following their surgery with non-specific symptoms such as lower limb pain and swelling; and be investigated with Doppler ultrasound to exclude deep vein thrombosis. Our survey confirms the heterogeneity in the management of patients presenting with these common symptoms post varicose vein

surgery. Of concern, our findings indicate a substantial proportion of physicians (49%), who are generally the patients' first port-of-call, prescribed unnecessary anticoagulation, most likely because they are not aware that limited superficial thrombophlebitis in the operated vein or its tributaries in the immediate period post varicose vein surgery is in fact a common and often expected occurrence.

To help prevent this error, clinical information on the vein procedure performed must be communicated to the sonographer and radiologist on the request form, as this is critical for the correct interpretation of ultrasound findings. Many sonographers use compressibility to assess for the presence or absence of thrombus. Without the clinical history of a recent varicose vein procedure, or in inexperienced hands, the thrombus filling the track of a stripped GSV can be mistakenly reported as extensive thrombophlebitis within the GSV, as in the case study in this survey. In this case where the GSV has been stripped and hence, the sonographer would not be able to visualise the wall of the vein, the term "extensive superficial thrombophlebitis throughout the course of the GSV" is not entirely accurate and should be avoided. Instead, a more detailed description such as: "Extensive superficial thrombophlebitis along the course of the GSV, without visualisation of the GSV wall. This can be seen post-varicose vein surgery" will help avoid misunderstandings.

In addition, clinicians should be aware of this post-operative phenomenon of phlebitis post varicose vein procedures and if the ultrasound is reported as superficial venous thrombosis, they would recognise this as an expected post-operative occurrence, and in the absence of deep vein thrombosis, there is no role for anticoagulation as in the case study. The common pain, swelling and phlebitis experienced by patients post varicose vein procedures can often be managed conservatively with compression stockings, cold compress and simple analgesia such as non-steroidal anti-inflammatory drugs. Our institution encourages patients post venous surgery who represents with pain or other complaints be reviewed by, or at least discussed with, the Vascular Surgery team to avoid inadvertent mismanagement of these patients.

### Conclusion

Limited superficial thrombophlebitis in the operated vein or its tributary soon after varicose vein surgery is a normal post-operative phenomenon and there is usually no role for anticoagulation unless there is evidence of deep venous thrombosis. Our survey showed that this is not well known in the medical community, which leads to unnecessary anticoagulation. Through this manuscript, we hope to raise awareness amongst clinicians to improve patient safety.

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### Conflict of Interest

The Authors declare that there is no conflict of interest.

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