SHORT REPORT OPEN ACCESS

# Management of Short Saphenous Vein Thrombosis Close to the Saphenopopliteal Junction: A Survey of the Membership of HaemSTAR, British Society for Haemostasis and Thrombosis and VTE Exemplar Centres in the United Kingdom

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## ABSTRACT

**Introduction:** The optimal management of superficial thrombophlebitis (STP) close to the saphenopopliteal junction (SPJ) is not known.

**Methods:** We conducted an online survey of members of the HaemSTAR network, British society of haemostasis and thrombosis and UK VTE exemplar network over a 6-week period.

**Results:** Fifty-three respondents participated in the survey (estimated 22% response rate). Note that 89% of respondents indicated they would manage all STP at the SPJ with anticoagulation, with 70% indicating they would offer 3 months of therapeutic anticoagulation. The most common threshold for instigating anticoagulation was being within 3 cm off the SPJ (68%). Factors most associated with the decision to anticoagulate included previous thrombosis, active malignancy, persistent immobilisation and severe symptoms (with hospitalisation, hyperestrogenaemic states, thrombophilia and recent surgery being additionally identified in the non-treatment group).

**Conclusion:** Despite lack of evidence, most UK practitioners surveyed offered intermediate to treatment doses of anticoagulation in the case of STP within 3 cm of the SPJ. Further research is needed to assess the validity of this approach.

**Trial Registration:** The authors have confirmed clinical trial registration is not needed for this submission.

## 1 | Introduction

Superficial vein thrombosis or thrombophlebitis (STP) of the lower extremity is common, with an incidence of 0.3–1.5 per 1000 person-years. Ninety percent of these are related to varicose veins [1–3]. The management of STP is not standardised. A risk-stratified approach is often taken depending on thrombus length, proximity to the deep femoral veins, severity of symptoms, previous thrombosis history and risk factors for propagation [4]. Note that 60%–80% of lower extremity STP affect the great saphenous vein (GSV) [1]. There is consensus that STP of the GSV within 3 cm of the saphenofemoral junction (SFJ) represents high risk for propagation and should be treated as deep vein thrombosis (DVT) [5, 6]. However, it is not known if STP in the short saphenous vein

(SSV) that is in close proximity to the saphenopopliteal junction (SPJ) carries the same propagation risk, and there are no data to guide its management or demonstrate whether the benefits of anticoagulation in this subgroup outweigh the associated bleeding risks. We conducted a survey of British thrombosis treaters to assess their attitude to the management of STP in close proximity to the SPJ.

## 2 | Methods

An 11-question online survey was designed by the lead author using Microsoft 365 Forms platform, pertaining to the diagnosis and management of STP in close proximity to the SPJ, and was further refined after discussion with the co-authors. This survey (Supporting Information) was circulated by e-mail to members of the HaemSTAR network (a UK-wide network of registrars in clinical haematology with a focus on non-malignant haematology), members of the British Society of Haemostasis and Thrombosis and the VTE Exemplar network (a network of VTE Exemplar Centres across England). Responses were invited over a 6-week period (from 1 August 2024 to 14 September 2024) and were anonymised. A reminder email was sent at 2 weeks. No incentives were provided. Responses were invited from all healthcare professionals with an interest in venous thrombosis, including consultant haematologists, consultant physicians with an interest in thrombosis medicine, trainees in medicine and haematology, specialist nurses and nurse consultants and pharmacists. Demographics of the respondents were also collected including current role, duration of service, work environment, number of patients with venous thrombosis seen per week and general comments were invited.

Results were analysed using the Microsoft 365 forms analytical platform.

## 3 | Results and Discussion

Fifty-three responses were received over a 6-week period. The total number of recipient email addresses were 239 (130 in the VTE Exemplar network, 78 from BSHT and 31 from the HaemSTAR network). The response rate was therefore 22% (assuming no overlapping membership and not taking into account the email being secondarily forwarded). The demographics of the survey respondents are outlined in Table 1.

**TABLE 1** | Demographics of survey respondents.

| | | Number (%) (total group = 53) |
|---|---|---|
| Current role | Consultant haematologists | 14 (26) |
| | Consultant physicians | 3 (6) |
| | Haematology trainees | 5 (9) |
| | VTE/thrombosis nurses and nurse specialists | 27 (51) |
| | Anticoagulation pharmacists | 3 (6) |
| | Vascular scientists | 1 (2) |
| Median experience (years) | 8 (95% CI, IQR range 1–25) | |
| Work setting | Haemophilia Comprehensive Care Centre | 16 (30) |
| | Haemophilia treatment centre | 8 (16) |
| | District General Hospital | 7 (13) |
| | Community setting | 1 (2) |
| | 'Other'[a] | 7 (13) |
| Number of thrombosis patients seen per week | Less than 5 | 7 (13) |
| | 5–10 | 6 (11) |
| | 10–15 | 11 (21) |
| | 15–20 | 11 (21) |
| | 20–25 | 5 (9) |
| | 25–30 | 6 (11) |
| | More than 30 | 6 (11) |
| | No answer | 1 (2) |

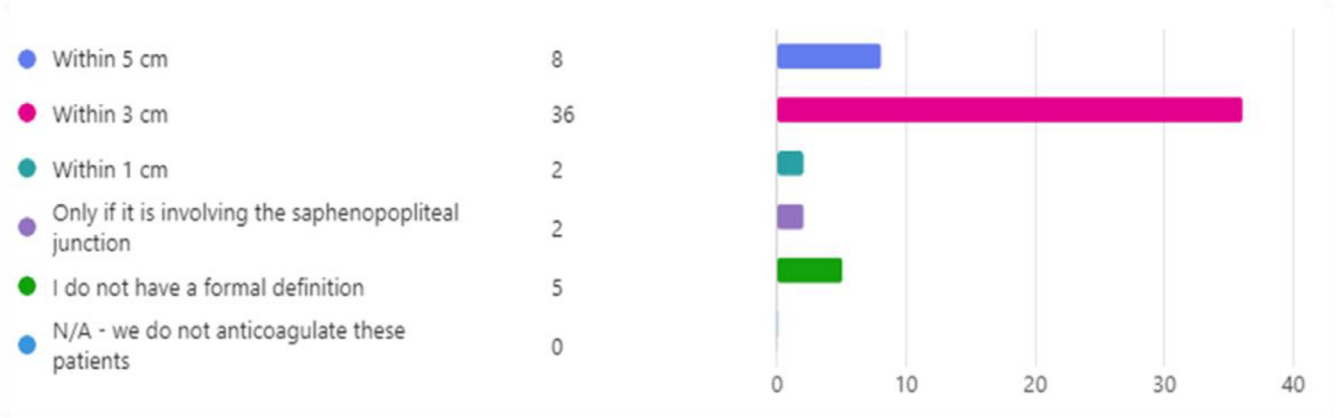
[a]A mixture of warfarin clinics and nurse-led DVT services in both inpatient and outpatient settings.

The main findings of the survey are shown in Figures 1 and 2. Note that 46 of 53 respondents (87%) indicated that they would offer anticoagulation if a patient had STP in close proximity of the SPJ, while five (9%) would treat a subset and two selected 'other', although one of those indicated they would actually anticoagulate the patient akin to DVT management (therefore the number of respondents who would anticoagulate all patients in this setting is actually 47 [89%]). The majority of respondents (36/53, 68%) defined this as STP within 3 cm of the SPJ, which is the cut off used to defined high-risk STP of the GSV; however, eight (15%) adopted a less restrictive cut-off of 5 cm, two (4%) adopted a more stringent cut-off of 1 cm and two (4%) adopted the approach of only offering anticoagulation if the SPJ itself was involved. Overall, 37 of 53 (70%) respondents indicated that they would treat STP at the SPJ as a DVT with 3 months of therapeutic anticoagulation, while three (6%) would offer therapeutic anticoagulation for only 6 weeks and 10 (19%) would treat with 6 weeks of rivaroxaban 10 mg, fondaparinux 2.5 mg or low molecular weight heparin (LMWH) at an intermediate dose. The majority of respondents do not offer a repeat scan.

Respondents identified a variety of risk factors as more likely to result in them offering anticoagulation. Figure 2 displays answers from all respondents. Those who chose 'other' were respondents who felt they would anticoagulate patients regardless. Patients with previous history of thrombosis, active malignancy, persistent immobilisation or severe symptoms were identified by more than

**Do you anticoagulate patients with thrombosis affecting the smaller/lesser saphenous vein (if identified) if it is close to, or involving the saphenopopliteal junction?**


**If you anticoagulate patients with thrombosis affecting the smaller/lesser saphenous vein in close proximity to the saphenopopliteal junction, what is your definition of 'close to saphenopopliteal junction'?**




**If you anticoagulate patients with thrombosis affecting the smaller/lesser saphenous vein in close proximity to the saphenopopliteal junction, what is your treatment of choice?**

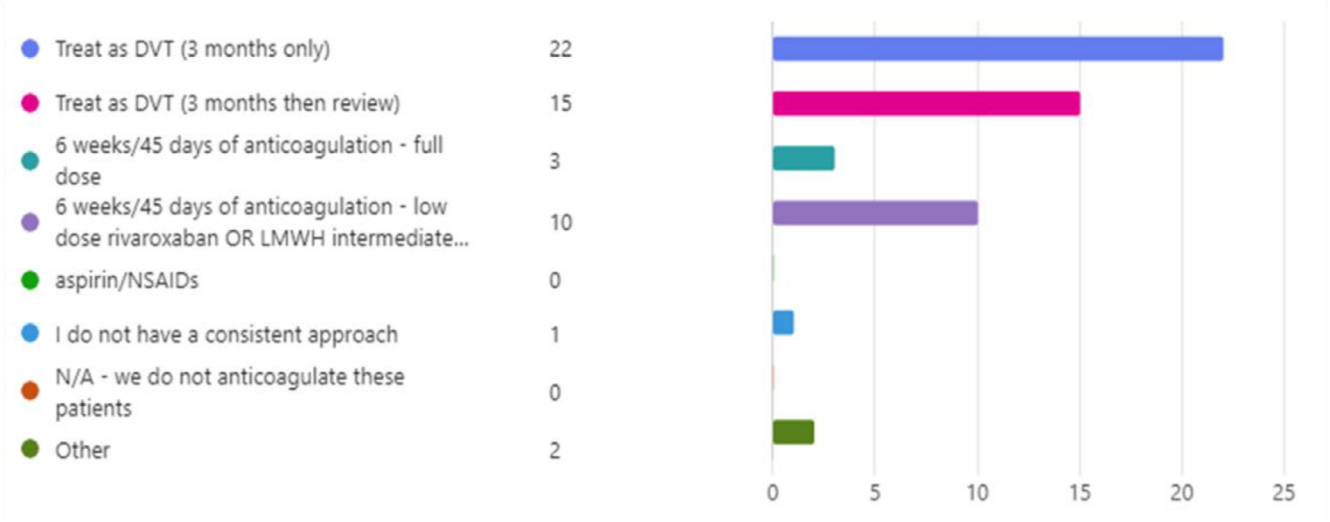



**FIGURE 1** | Survey results: Key findings.

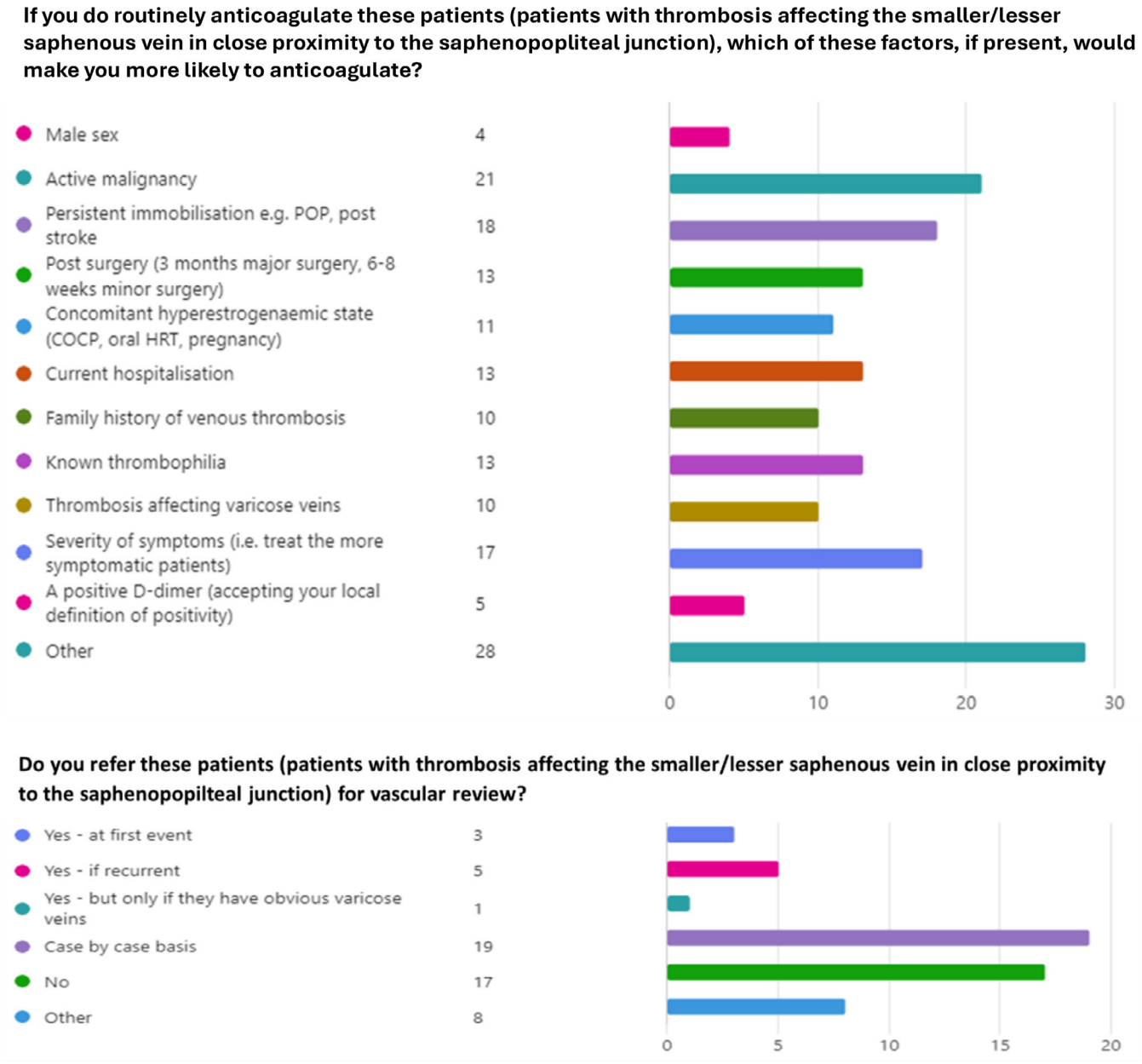



**FIGURE 2** | Survey results: Key findings continued.

15% of the total respondents as factors favouring anticoagulation, while male sex and a positive D-dimer were identified by 5% or less of respondents as favours favouring anticoagulation. When analysis was confined to the seven respondents who would not routinely anticoagulate, the risk factors whose presence was identified as most likely to result in a decision to anticoagulate were hospitalisation (five), persistent immobilisation (five), prior history of VTE (five), followed by active malignancy (four), hyperestrogenaemic states (four), then severity of symptoms (three), thrombophilia (three) and post surgery (three). Finally, the majority (45/53, 85%) did not routinely refer patients for vascular review, with 19 (36%) referring on a case-by-case basis, 17 (32%) not referring at all, three (6%) referring at first event, five (9%) referring if recurrent and one (2%) referring if there are obvious varicose veins. Eight of 53 (15%) selected 'other'. Of the latter group, four of 53 (7.5%) deferred the decision on a vascular referral to the patient's general practitioner, one (2%) deferred decision to a haematologist at a follow-up visit, and three having an agreement with their vascular departments to refer patients with recurrent events as well as varicose veins (5.6%).

The results of this survey highlight several interesting findings. Note that 89% of respondents would treat all patients with STP at the SPJ with anticoagulation (therapeutic or intermediate/reduced dose), and 70% would offer 3 months of therapeutic anticoagulation. We believe this practice is extrapolated from the literature on STP within 3 cm of the SFJ [4–7]. The anatomy of the SSV is more variable that the GSV, as is its termination point [8]. The natural history of thrombosis affecting the SSV is less well studied, and few studies are performed that have assessed propagation or recurrence risk in this scenario. A 2003 study of the natural history of SSV thrombosis only included 33

cases [2]. This study identified a concomitant DVT in 65.6% of cases and reported higher resolution rates at 3 months if there was a concomitant DVT (56% vs. 14%), probably as these patients were more likely to be anticoagulated but did not comment on proximity to the SPJ nor offered serial follow ups of that subgroup if they were observed without treatment. The POST study, a large observational study involving 832 patients with clinically evident STP, only included 48 patients with isolated STP within 3 cm of the SPJ, and identified a higher risk of concomitant DVT (OR 3.3, $p = 0.003$), which was similar to that of the STP within 3 cm of the SFJ (OR 3.6, $p < 0.001$) [9]. However, the study was cross-sectional and did not follow patients with STP of the SSV serially to assess propagation risk. Another major observational study (OPTIMEV) identified involvement of the SFJ or SPJ as associated with a non-statistically significant increase in recurrence risk, but outcomes were pooled for both anatomic regions [10]. Therefore, while the literature identifies a higher risk of concomitant DVT, which would be identified by the index scan, there is scant evidence of increased risk of propagation or recurrence in patients with STP within 3 cm of the SPJ [11].

Interestingly, the three main randomised controlled trials upon which management of STP is currently based had different approaches when it comes to STP at the SPJ. The CALLISTO trial, comparing fondaparinux 2.5 mg to placebo, as well as the SURPRISE trial, a non-inferiority trial comparing fondaparinux to rivaroxaban, both excluded patients with STP within 3 cm of the SFJ, as they judged these patients to have a 'DVT-equivalent' [12, 13]. Neither of these trials however actively excluded STP at the SPJ from inclusion, and there was no subgroup analysis looking at this particular subgroup [12, 13]. In contrast, the STEFLUX trial, comparing different regimens of LMWH in the treatment of STP, excluded both STP at the SFJ and at the SPJ from enrolment, considering both to be 'DVT equivalent', but not offering an explanation for this decision [14]. Similarly, international consensus guidelines differ on their recommendation in this particular scenario of STP within close proximity to the SPJ. There is no special mention of this category in either the 2021 American College of Chest Physician guidelines on management of venous thromboembolism or the 2020 American Society of Haematology VTE guidelines [6, 7], and there is no recommendation to treat this in the British National Institute of Clinical Excellence (NICE) guidelines either [4, 15]. On the other hand, Thrombosis Canada guidelines [16], the European Society for vascular surgery 2021 clinical practice guidelines [17] and a 2015 French guideline [18] all recommend treating STP within 3 cm of either the SFJ or SPJ as DVT. The basis of these recommendations by the latter groups appears to be extrapolations and reliance on the POST and OPTIMEV studies, which have been previously critiqued [9, 10].

There is increasing recognition that STP is not a benign disease, with frequent concomitant and subsequent DVT and, to a lesser extent, PE [1, 12, 15]. The advent of widespread use of oral FXa inhibitors has shifted the pendulum toward treating patients, given their safety, fewer interactions and fixed dosage approach [6, 7]. Moreover, there is evidence that treatment of STPs hastens recovery [12–15]. However, there is still a risk of major and clinically relevant non-major bleeding with DOACs, and therefore risk stratification and a carefully considered approach are crucial to identify the subset of patients where the benefit of anticoagulation outweighs the bleeding risks. It is clear that STP within close proximity of the SPJ may carry an increased risk of concomitant DVT [2, 11], which can be identified sonographically; however, there is insufficient evidence that such thrombi are at high risk of propagation or recurrence and that they should be routinely treated.

This survey-based study has some limitations. It was conducted over a 6-week period that may not have been sufficient time to gather more responses. We estimate a response rate of 22% based on the total number of recipients, but it is well known that the membership of these organisations can overlap, and the email may have been forwarded to second parties, thus making an exact calculation of the completion rate not possible. There were no limitations on how many participants from a particular centre could respond, so it is possible that multiple participants from the same centre disproportionately contributed to the overall results. Respondents predominantly worked in the hospital setting, affecting the generalisability of the findings. Respondents were not asked, proportionately, how many superficial versus deep thromboses they saw on a weekly basis. Finally, there is a risk of non-response bias whereby those who chose to respond to the survey are those who are more likely to actively treat this particular subtype of STP.

In summary, STP within close proximity to the SPJ represents a unique situation with unclear propagation and recurrence risk. There is a dearth of evidence on its management and conflicting approaches as to whether they should be treated akin to STPs within close proximity of the SFJ. A survey of venous thrombosis treaters in the UK has shown high rates of consensus on aggressive treatment of these thromboses, with 89% of respondents recommending anticoagulation and 70% offering therapeutic anticoagulation for 3 months. There is need for better assessment of the prevalence of this clinical situation through large surveillance studies and a need for a randomised clinical trial of these patients to evaluate the best management approach.

### Author Contributions

K.K. designed the original survey with input from L.W. and N.C. L.W. and N.C. aided in dissemination of the survey to the target groups. K.K. performed the survey result analysis and prepared the initial manuscript. L.W. and N.C. contributed heavily to the revision and finalisation of manuscript. All authors have significantly contributed to the design and writing up of this project.

### Ethics Statement

The authors have nothing to report.

### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## Supporting Information

Additional supporting information can be found online in the Supporting Information section.