



# Management of Superficial Vein Thrombosis in Patients with Varicose Veins: A Survey among Members of National Surgical Society from Republic of Moldova

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**Purpose:** Management of superficial vein thrombosis (SVT) in patients with varicose veins (VV) is not currently standardized. We performed a survey aimed to demonstrate patterns in the management of SVT in the Republic of Moldova.

**Materials and Methods:** This was a descriptive study whereby members of the National Surgical Society were asked to complete an online questionnaire. In the questionnaire, multiple-choice questions were supplemented with four clinical vignettes of real patients with SVT.

**Results:** The questionnaire was completed by 102 participants (31.1% response rate). In the treatment of SVT, duplex ultrasound was routinely used by 74.5% of respondents, and anticoagulants were used by 70.5%. The full therapeutic dose of anticoagulants was recommended by 63.3% of surgeons, intermediate dose by 21.1%, and prophylactic dose by 15.6%. Only 50% of respondents were prescribed anticoagulants for 1 month or more. In case of surgical intervention for SVT, cross-section and stripping were performed by 84.0% of surgeons, while isolated cross-section by 10.7%. In all clinical vignettes, the majority of respondents opted for urgent surgical treatment. The rate of proponents of surgery varied from 43% in cases of isolated thrombosis of tributaries, and up to 72.5% in cases of thrombosis up to the sapheno-femoral junction.

**Conclusion:** Management of patients with SVT and VV in the Republic of Moldova is far from standardized. Prescribed doses of anticoagulants, as well as the duration of anticoagulation are highly variable and often contradict the recommendations of current guidelines. Urgent cross-section and stripping dominate the pattern of current therapeutic approaches.

**Key Words:** Superficial vein thrombosis, Varicose veins, Anticoagulation, Surgery, Moldova

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## INTRODUCTION

According to recent cohort studies, the incidence of superficial vein thrombosis (SVT) varies between 0.64 to 1.31

cases per 1,000 person-years, which is similar to or even higher than that of deep vein thrombosis [1,2]. The absolute majority (around 80%) of SVT cases are diagnosed in patients with varicose veins (VV) in the lower limbs [2,3].

The management of VV complicated with SVT is not standardized, especially with regards to the optimal therapeutic approach. Current guidelines and the results of systematic reviews support the use of fondaparinux, low molecular weight heparins, or direct oral anticoagulants over the course of 4 to 6 weeks as a primary treatment. Generally, surgical intervention is reserved for selected cases in the acute phase of SVT, usually if the thrombus is in close proximity to the sapheno-femoral or sapheno-popliteal junction [4-9]. However, the grade of implementation of these recommendations in routine clinical practice is significantly influenced by several factors: the specialty of practitioners involved in the management of SVT; local availability of various treatment modalities; cost of treatment and its coverage by medical insurance; and by patient and physician preferences.

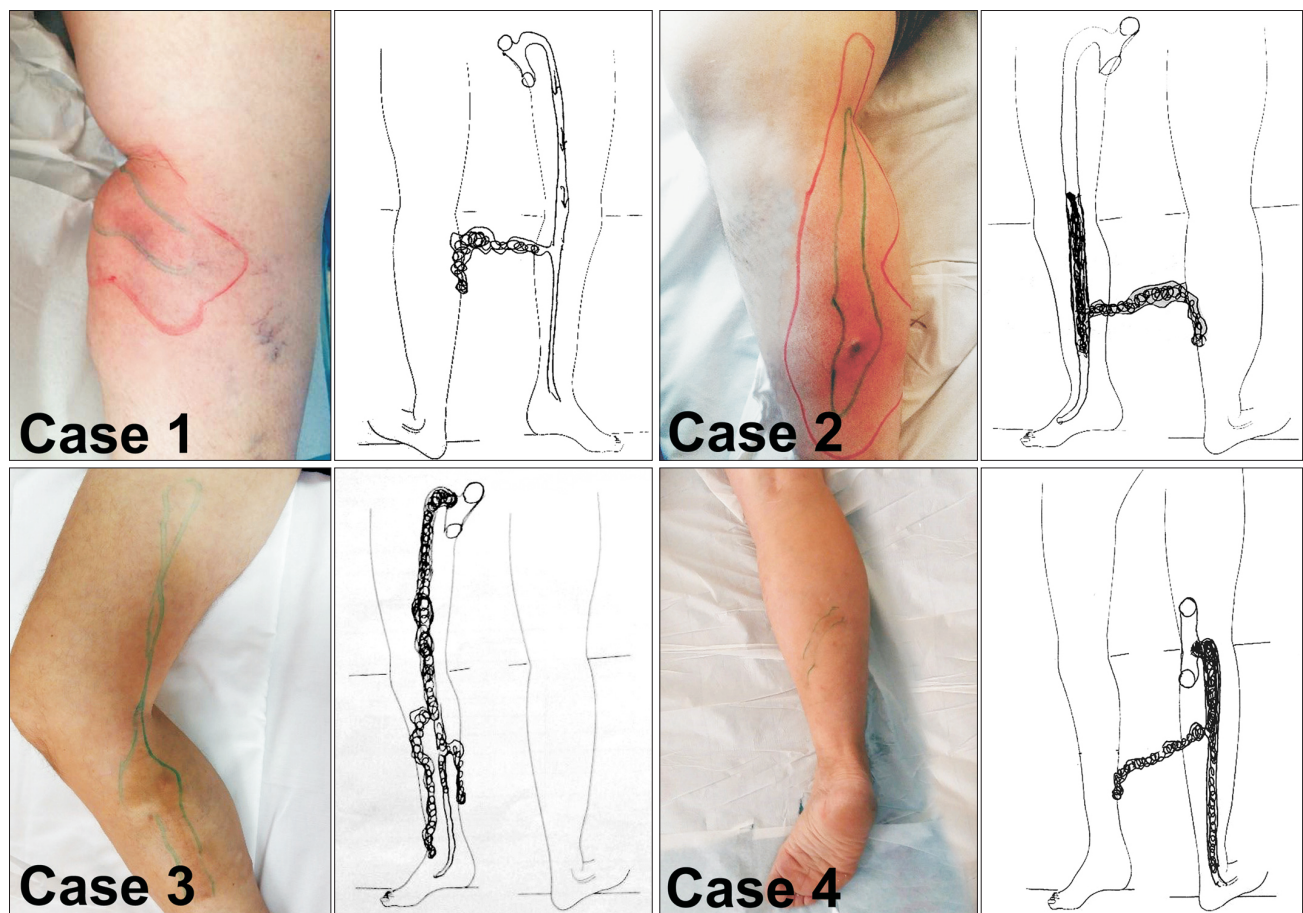
In the Republic of Moldova vascular surgery is not yet an independent specialty, and patients with SVT and VV are treated by general surgeons. Accordingly, we performed a survey among the members of National Surgical Society

with the aim to demonstrate local patterns in the management of SVT, and to compare the results to those of previous surveys from other countries.

## MATERIALS AND METHODS

This was a descriptive transversal cohort study of members of the National Surgical Society from the Republic of Moldova that utilized a special online questionnaire created in Google Forms ([docs.google.com/forms](https://docs.google.com/forms)). Invitation to participate in the survey was sent by e-mail in March 2019 to all members of the Society, according to the recently updated mailing list, which included 327 persons. The invitation included a link to the online questionnaire, and information regarding the aim of study and anonymous character of the survey. Repeated invitations were sent in April 2019 and May 2019.

The questionnaire was developed in Romanian and included 15 closed-ended questions in a multiple-choice format, structured in three domains: 1) characteristics of



**Fig. 1.** Illustrations accompanying the four clinical vignettes of superficial vein thrombosis in real patients with varicose veins: Photograph of affected leg (red line marks the area of hyperemia, and the green line marks the contour of the thrombosed varicose veins); and schematic drawings of the results of duplex ultrasound examination.

the physician's current practice, 4 questions; 2) diagnosis of SVT, 3 questions; and 3) treatment of SVT in patients with VV, 8 questions. At the end of questionnaire, four clinical vignettes of real patients with photographs of the extremities affected by SVT, as well as schematic drawings of the results of the duplex ultrasound examination were provided (Fig. 1). For each case, participants were asked to select one from the proposed variants of treatment or to provide their own therapeutic approach.

Individual responses to the questionnaire were gathered anonymously using the Google Forms webpage, and transferred to a Microsoft Excel 2011 spreadsheet for further confidential analysis. A two-tailed Fisher's exact test was used to compare the proportions, and a P-value of <0.05 was considered statistically significant.

The survey was exempt from formal Institutional Review Board review as it was a component of a PhD research project of the first author that was approved by the Institutional Research Ethics Committee of the State University of Medicine and Pharmacy "Nicolae Testemitanu" on February 12, 2018 (decision nr. 38).

## RESULTS

By the close of the survey (June 1, 2019) the questionnaire was completed by 102 participants and had a 31.1% response rate. The absolute majority of participants were working in surgical departments of public hospitals, and only 3 (2.9%) physicians were fully employed in a private surgical practice. There was a uniform distribution of respondents according to the years of professional activity: 5 years or less, 23 (22.5%); 6 to 10 years, 25 (24.5%); 11 to 20 years, 26 (25.5%); and more than 20 years, 28 (27.5%) physicians. The personal caseload in the management of SVT among the participants was relatively low: 44 (43.1%) surgeons treated just 5 to 10 patients per year, while only 15 (14.7%) physicians declared that they usually manage more than 20 SVT cases in patients with VV per year.

Duplex ultrasound was used for the diagnosis of SVT by the majority of the respondents, 76 (74.5%). However, 5 (4.9%) physicians stated that they only used duplex ultrasound occasionally, while the other 8 (7.8%) said that they never performed imaging studies in patients with SVT. It should be highlighted that 13 (12.7%) surgeons were working in departments where duplex ultrasound was unavailable. Mandatory hospitalization and in-patient treatment of SVT was recommended by 75 (73.5%) physicians. Exclusively out-patient management was preferred by 13 (12.7%) respondents, while the remaining respondents (13.7%) stated that they would only consider hospitalizing the patient in the following cases: ascending character of thrombosis,

involvement of junctions with deep veins or severe pain in the affected leg.

The level of D-dimers was routinely tested in cases of SVT by 26 (25.5%) surgeons, while 9 (8.8%) physicians reported selective use of this test without any further clarification of the indications. An similar number of respondents (32.3% and 33.3%) stated either that they never used the D-dimer test in the diagnostic work-up of SVT, or that the test was unavailable in their institution.

The most frequently selected therapeutic approach in patients with VV and SVT was the prescription of anticoagulants, noted by 70.5% of participants in the survey. Surgical intervention in the acute phase of thrombosis was used by 59.8% of respondents, and symptomatic treatment alone (non-steroidal anti-inflammatory drugs combined with elastic compression and topic medication) was used by 31.3% (the sum is >100% since selection of several options was allowed). A total of 50.9% of the respondents declared that they routinely used only one type of treatment for SVT in their practice, mainly anticoagulation. Two therapeutic options were used by 37 (36.3%) surgeons, and 13 (12.7%) physicians reported using all three SVT management options. The detailed structure of the types of treatment is presented in Fig. 2. We found that among the respondents who performed surgery for the treatment of acute SVT the proportion of physicians with a personal caseload of more than 10 cases/year was significantly higher compared to the respondents who opted for conservative management only: 29/61 (47.5%) vs. 9/41 (22.0%),  $P < 0.05$ .

In the next question, participants were asked to indicate the antithrombotic drugs that they normally use for the medical treatment of SVT. The majority of surgeons gave priority to parenteral direct anticoagulants: 91 (89.2%) se-

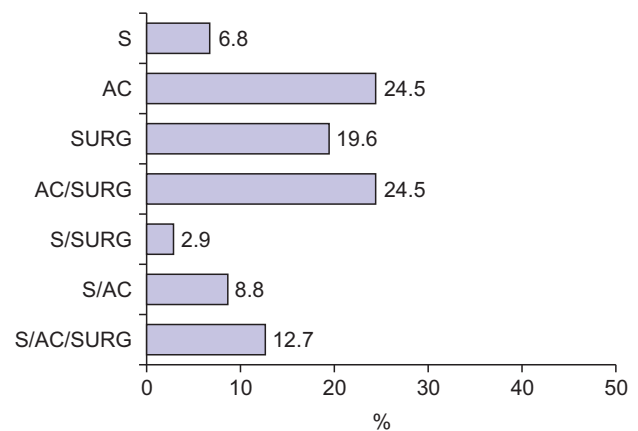


Fig. 2. Structure of the therapeutic approaches used by participants in the management of patients with superficial vein thrombosis and varicose veins. S, symptomatic treatment; AC, anticoagulation; SURG, surgical intervention.

lected unfractionated heparin, while 77 (75.5%) selected low molecular weight heparin. A new oral anticoagulant (only rivaroxaban is currently available in Moldova) was used by 43 (42.2%) physicians, aspirin was used by 28 (27.5%), warfarin was used by 22 (21.6%), and fondaparinux was used by 19 (18.6%). A total of 90 respondents provided answers relating to the administration regime of anticoagulants in SVT patients. The full therapeutic dose (recommended for treatment of deep vein thrombosis) was used by 57 (63.3%) surgeons, an intermediate dose (ranging between therapeutic and prophylactic) was used by 19 (21.1%), and a prophylactic dose was used by 14 (15.6%). Answers relating to the recommended duration of anticoagulation use were as follows: 1 week, 13 (14.4%) physicians; 2 weeks, 17 (18.9%); 3 weeks, 15 (16.7%); 1 month, 24 (26.7%); and more than 1 month, 21 (23.3%) physicians. Furthermore, it should be mentioned, that administering an intermediate dose of anticoagulant for 1 month or more was recommended by only 9 respondents.

A total of 75 participants shared their opinion regarding the most appropriate type of surgery in the acute phase of SVT. The majority of respondents, 63/75 (84.0%), opted for “radical” intervention, including crosssection and stripping, and phlebectomy of varicose tributaries. Crosssection as a sole procedure or in combination with stab thrombectomy from varicose tributaries was the preferred approach of 8 (10.7%) surgeons. Four participants (5.3%) opted for isolated decompression of the thrombosed VV through micro incisions. A total of 38 (50.7%) surgeons stated that intervention was performed during the first 24 hours from the moment of patient admission to the hospital, 24 (32.0%) stated that they performed surgery on day 2 or 3, and 13 (17.3%) performed surgery after more than 72 hours.

The therapeutic strategies selected by the participants for the four different clinical cases of SVT in patients with VV are presented in Table 1. In all presented cases, the majority of respondents opted for urgent surgical treatment.

The rate of the proponents of surgical intervention varied from 43% in cases of isolated thrombosis of saphenous tributaries, up to 72.5% in cases of thrombus extension up to the level of the sapheno-femoral junction. Anticoagulation for 1 month or more was selected by a significantly higher proportion of surgeons in cases of protrusion of the thrombus from the saphenous trunk into the deep (popliteal) vein (Case #4). In contrast, symptomatic treatment was predominantly recommended for patients with isolated thrombosis of varicose tributaries. The proportion of physicians who opted for anticoagulation for less than 1 month was not significantly different between the cases.

At the end of survey, participants were asked to recall cases of clinically manifested or fatal pulmonary embolism developed in patients hospitalized with VV and SVT. A total of 26 (25.5%) respondents provided a positive answer: 10 surgeons remembered at least one case of pulmonary embolism after surgery for SVT, and the other 16 during conservative treatment.

## DISCUSSION

Several surveys regarding the management of SVT have been previously performed among the members of medical societies from Europe and North America [10-13]. The number of respondents have varied from 88 to 487, and included general practitioners, vascular and general surgeons, phlebologists, and other specialties. Similarly to our study, the majority of the participants in previously published surveys treated around 10 SVT cases per year [10,13].

Although duplex ultrasound is considered to be the gold standard for examination of the lower limb venous system, survey results demonstrated that 5% to 40% of the physicians never perform any imaging in patients with SVT [10,11]. Such an approach is difficult to advocate keeping in mind the relative high coexistence of deep vein thrombosis [14]. Moreover, the existing guidelines and consensus docu-

**Table 1.** Therapeutic approaches preferred by participants in the survey of the four clinical vignettes of superficial vein thrombosis

	Case 1 Thrombosis of GSV tributaries (n=102)	Case 2 Thrombosis of GSV trunk at the knee level (n=102)	Case 3 Thrombosis of GSV trunk up to SFJ (n=102)	Case 4 Thrombosis of SSV trunk and SPJ (n=102)
Preferred therapeutic approach				
Surgery in acute phase	44 (43.1)	61 (59.8)	74 (72.5) <sup>†</sup>	58 (56.8)
Anticoagulation for <1 month	20 (19.6)	26 (25.5)	17 (16.7)	6 (5.9)
Anticoagulation for ≥1 month	10 (9.8)	7 (6.8)	9 (8.8)	33 (32.4)*
Symptomatic treatment	28 (27.5)*	8 (7.8)	2 (2.0)	5 (4.9)

Values are presented as number (%).

GSV, great saphenous vein; SSV, small saphenous vein; SFJ, sapheno-femoral junction; SPJ, sapheno-popliteal junction.

\*P<0.001 vs. all other cases. <sup>†</sup>P<0.05 vs. Case #1 and Case #4.

ments recommend selection of the therapeutic strategy in SVT based on data derived from the results of imaging studies, including the anatomical location and extension of thrombosis. In contrast, current guidelines do not provide any recommendations regarding the use of the D-dimer test in cases of SVT. Despite this, in our study, the proportion of surgeons who either routinely or selectively use the D-dimer test was unexpectedly high as being more than 50% compared to 22% in the French survey [12]. Therefore, it can be speculated that a normal level of D-dimer can be used by practitioners to rule out simultaneous ipsilateral or contralateral deep vein thrombosis; however, this hypothesis requires further testing.

The major heterogeneity in the therapeutic approaches used by physicians in cases of SVT can be determined from different surveys, as well as between the individual answers from each study. Results of our questionnaire showed that approximately 70% of surgeons use anticoagulation for SVT treatment, while nearly 60% perform urgent surgical interventions. Other surveys provide comparable data in that treatment with anticoagulants is recommended by 72% to 86% of respondents, and surgery in the acute phase of thrombosis is performed by approximately 40% of surgeons [11-13]. However, the only survey performed in the United Kingdom in 2012 demonstrated a more conservative approach. The absolute majority (80%) of respondents opted for treatment with anti-inflammatory drugs, 25% for anticoagulation, and just 15% for surgery. However, it should be noted that 46% of the participants in this survey were general practitioners [10].

In all surveys that report the type of recommended anticoagulants, the highest ranked are heparins, especially low molecular weight heparins. In Moldova unfractionated heparin was most commonly used, probably due to its low cost and wide availability. Fondaparinux, which was studied in the largest randomized controlled trial in patients with SVT, was the second antithrombotic option in the surveys performed among French specialists and among the participants of the European Venous Forum [12,13]. In contrast, in the current study, fondaparinux was only used by 19% of respondents. Interestingly, in previously published surveys, direct oral anticoagulants were selected for SVT treatment by only 6% to 7% of physicians, which was approximately 6-fold less than the results of our questionnaire. In our opinion this finding can be explained by the impact of the results of the SURPRISE randomized study published in 2017 [15].

Practical interest represents the doses of the heparins used by physicians for treatment of SVT, as well as the duration of anticoagulation. Although recent guidelines and consensus documents mainly advise the administration of

intermediate doses for at least 1 month, real world practice is not fully compliant with this recommendation. Indeed, according to previous surveys, the full therapeutic dose is preferred by the majority of practitioners, namely, 40% in the survey of European Venous Forum, 55% in the French survey, and 63% in the current study. The proportions of proponents of prophylactic dosages of anticoagulants in patients with SVT fluctuate from one survey to another, between 17% and 27% [12,13]. Furthermore, only half of the respondents from our study recommended ongoing anticoagulation for 1 month or longer, compared to 70% to 80% in other publications. Even for clinical cases with protrusion of the thrombotic apex into the deep vein (Case #4), extended anticoagulation was only recommended by 32% of respondents. It is likely that this discrepancy can be explained by the fact that Moldova is a low-income country and medical insurance does not provide reimbursement for out-patient anticoagulant treatment.

Although available guidelines and consensus documents suggest that surgical intervention should only have a secondary role in the management of acute SVT, in our survey the proportion of physicians who gave priority to this type of treatment was relatively high. While surgery was most often proposed for cases of thrombosis up to the level of the sapheno-femoral junction, it was also recommended by the majority of respondents for cases of isolated thrombosis of tributaries and for patients with thrombus extension into the popliteal vein. We also found that surgeons from Moldova predominantly (84%) combine crosssection with saphenous stripping when performing surgical interventions for SVT in VV patients. In our survey, isolated crosssection was only recommended by 10% of participants. It should be mentioned that in surveys with a heterogeneous cohort of participants (surgeons, vascular surgeons, general practitioners, phlebologists, dermatologists), both variants of surgical intervention are reported by an almost equal number of respondents [13].

This study is not without limitations. There are no doubts that comparison of outcomes of conservative and surgical treatment in patients with VV and SVT can provide the most valuable scientific information. However, the design and methodology of our survey are not appropriate for direct acquisition and analysis of clinical data.

## CONCLUSION

Similarly to other countries, the management of patients with SVT and VV in the Republic of Moldova is highly heterogeneous and not yet standardized. As general and vascular surgeons are involved in the medical care of these patients, urgent crosssection and stripping dominates the

pattern of possible therapeutic strategies. It should be highlighted that the rationale of this rather aggressive approach, as well as of the prescription of full dose anticoagulation for less than 1 month currently is not supported by scientific evidence. Therefore, there is a need for a comprehensive audit of the results of conservative and surgical treatment of patients with acute SVT and VV, and harmonization of routine clinical practice with the recommendations of existing and upcoming evidence-based guidelines.

## CONFLICTS OF INTEREST

The authors have nothing to disclose.

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## AUTHOR CONTRIBUTIONS

Concept and design: FB, DC. Analysis and interpretation: FB, DC, VC. Data collection: FB, VC. Writing the article: FB, DC. Critical revision of the article: VC, EG. Final approval of the article: all authors. Statistical analysis: DC. Obtained funding: none. Overall responsibility: DC.

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