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Superficial Thrombophlebitis of the Lower Limbs in Patients with Varicose Veins

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Abstract

Purpose. This study reviews 51 consecutive patients with superficial thrombophlebitis (STP) among 710 patients treated for varicose veins in our department.

Methods. An assessment was made of various factors involved.

Results. Of these 51 patients, 21 (41.1%) had systemic disorders, including 4 (7.8%) with malignant diseases. Six patients (11.8%) had deep vein thrombosis (DVT) and five (9.8%) had pulmonary embolism (PE). All of the patients with DVT and/or PE had a thrombus in either the greater saphenous vein or the lesser saphenous vein; however, none of the patients with STP and a thrombus in the distal saphenous branch had either DVT or PE. The levels of coagulofibrinolytic markers such as fibrin degradation product-D dimer, plasmin α_2 plasmin inhibitor complex, and thrombin antithrombin III complex were elevated in patients with STP or DVT, compared with those with varicose veins only. The level of C-reactive protein (CRP) was also elevated in the patients with STP or DVT. These findings indicate that STP is not necessarily a localized disease, but may be a symptom of systemic disease. In addition to duplex scanning, the measurement of coagulofibrinolytic markers as well as CRP may be useful for detecting STP and/or DVT prior to the treatment of varicose veins.

Key words Deep vein thrombosis · Pulmonary embolism · Fibrin degradation product D dimer · Thrombin antithrombin III complex · Plasmin α_2-plasmin inhibitor complex

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Introduction

Superficial thrombophlebitis (STP) is a common complication of varicose veins, and generally considered to be a benign disease that can be treated as part of the overall intervention for varicose veins. However, in most situations where STP is encountered, surgeons focus on local treatment and may overlook underlying systemic diseases. Numerous cases have been reported of deep vein thrombosis (DVT) and subsequent pulmonary embolism occurring in patients with STP, the frequency of DVT among STP patients ranging from 5.6% to 44%.[1–6] Collagen disease or a congenital hypercoagulable state may be accompanied by STP, but the association of STP with obscure neoplastic disease should be considered. Although the incidence of venous thrombosis has recently increased in Japan, it is still considered to be much lower than in Western countries, and a very limited number of studies are available regarding STP within the Japanese population.[7] Thus, the aim of this study was to review a series of cases of STP associated with varicose veins and to assess the frequency of DVT, the patient's background, complications, laboratory data of coagulofibrinolysis as markers for diagnosis, and the results of treatment.

Patients and Methods

A total of 710 consecutive patients referred to our vascular clinic between January 1992 and March 2000 underwent treatment for primary varicose veins of the lower legs. STP was diagnosed in 51 of these patients (7.2%), and are the subjects of this study. There were 15 men and 36 women, ranging in age from 30 to 71 years, with a mean age of 56 ± 10 years. The initial diagnosis of STP was made at our outpatient clinic in 48 of the 51 patients. The duration of symptoms following the onset of the disorder was less than 14 days in 26 patients, and

14 or more days in 22 patients. The diagnosis of STP was based on the presence of a cord-like structure or knot along the course of a vein. Duplex scanning was also utilized to determine the position of the clot in the superficial vein and to provide clinical information about the extension into the deep venous system. Three patients were diagnosed as having STP when thrombosed veins were found at the time of surgery. The location and extent of STP were recorded and detailed anamnesis was taken for those patients. The diagnosis of DVT was also determined by duplex scanning to detect a thrombus after evaluating both the patency and valvular function of the deep venous systems. Perfusion lung scan was performed to screen for pulmonary embolism (PE) in patients with DVT. A blood sample was collected from each patient prior to treatment and the coagulofibrinolytic state was assessed by measuring plasma fibrin degradation product-D dimer (FDP-DD), plasmin α_2 plasmin inhibitor complex (PIC), and thrombin antithrombin III complex (TAT) in patients diagnosed with STP between January 1996 and March 2000. These values were compared with those measured in ten patients treated for primary varicose veins without STP between November 1999 and March 2000.

Statistical Analysis

Data are expressed as mean ± standard deviation. Statistical comparisons were performed using one-way analysis of variance followed by the Scheffe's test to compare values of FDP-DD, PIC, and TAT among the groups. Significant differences were determined at a P value of 0.05. All analyses were performed with commercially available software (Statview version 4.5 for Macintosh, Abacus Concepts, Berkeley, CA, USA).

Results

Complications and Past History

Complications or a past history of potential risk factors for the development of STP were revealed in 21 (41.1%) of the 51 patients (Table 1). Four patients had malignancy, including two gastric cancers, one breast cancer, and one prostate cancer. Three patients had antiphospholipid antibody and another two had previously been diagnosed with rheumatism. The other complications included atherosclerotic diseases, immune disease, benign tumors, and gynecologic diseases.

Location of STP

STP affected the right leg in 27 patients, the left leg in 22, and both legs in 2. Table 2 shows the locations of STP. The most proximal site of a thrombus was the saphenofemoral junction in four patients, the midthigh long saphenous vein in three, and the greater saphenous vein, from the ankle to the groin, in four. In the short saphenous vein, the proximal site was the saphenopopliteal junction in three patients, and the calf vein in one. The other 36 patients had a thrombus only in the distal saphenous branches. DVT was diagnosed in six patients. Although none of the patients in this study experienced any clinically apparent pulmonary emboli, a perfusion lung scan detected pulmonary emboli in four of the six patients with DVT.

Table 1. Complications or risk factors in patients with varicose veins and superficial thrombophlebitis

Malignacy	4 (7.8%)
Antiphospholipid syndrome	3 (6.9%)
Rheumatism	2 (3.9%)
Puerperium	2 (3.9%)
Polycythemia	2 (3.9%)
Asthma	1 (2.0%)
Myoma uteri	1 (2.0%)
Intestinal myoma	1 (2.0%)
Diabetes mellitus	1 (2.0%)
Endometriosis	1 (2.0%)
Hyperthyroidism	1 (2.0%)
Brain infarction	1 (2.0%)
Myocardial infarction	1 (2.0%)
Total	21/51 (41.1%)

Table 2. Location of superficial thrombophlebitis

	No.	DVT	PE
Greater saphenous vein			
S-F junction	4	1	1
Midthigh	3	0	0
Total long saphenous vein	4	2	1
Lesser saphenous vein			
S-P junction	3	2	2
Calf	1	1	0
Saphenous vein tributary	36	0	—[a]

DVT, deep vein thrombosis; PE, pulmonary embolism; S-F junction, saphenofemoral vein junction; S-P junction, saphenopopliteal vein junction

[a] Lung perfusion scan not performed

Laboratory Data

We measured several markers of the activation of plasma coagulation and/or fibrinolysis in addition to routine inflammation markers such as C-reactive protein (CRP) and white blood cell (WBC) counts (Figs. 1 and 2). Among the groups classifed according to the presence of DVT or STP with varicose veins, the mean values of FDP-DD, TAT, PIC, and CRP in the patients

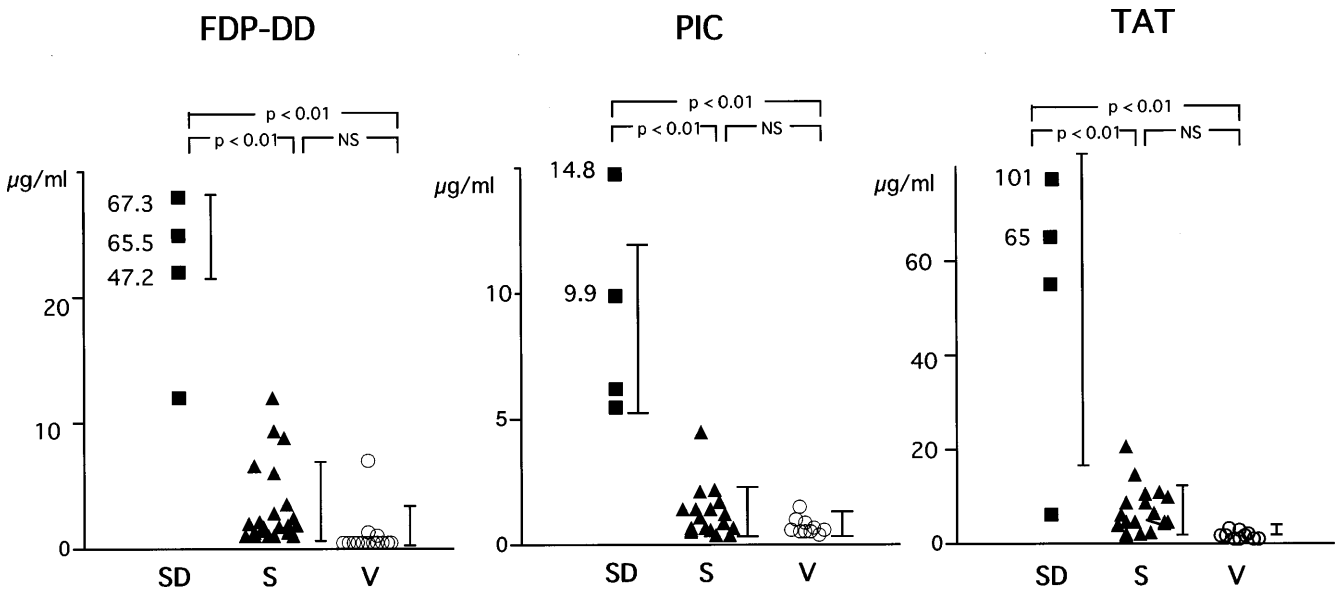

Fig. 1. Coagulofibrinolytic markers in patients with varicose veins. *SD*, patients with both superficial thrombophlebitis (STP) and deep vein thrombosis; *S*, patients with STP; *V*, patients with varicose vein only; *FDP-DD*, fibrin degradation product-D dimer; *PIC*, plasmin α_2 plasmin inhibitor complex; *TAT*, thrombin antithrombin III complex

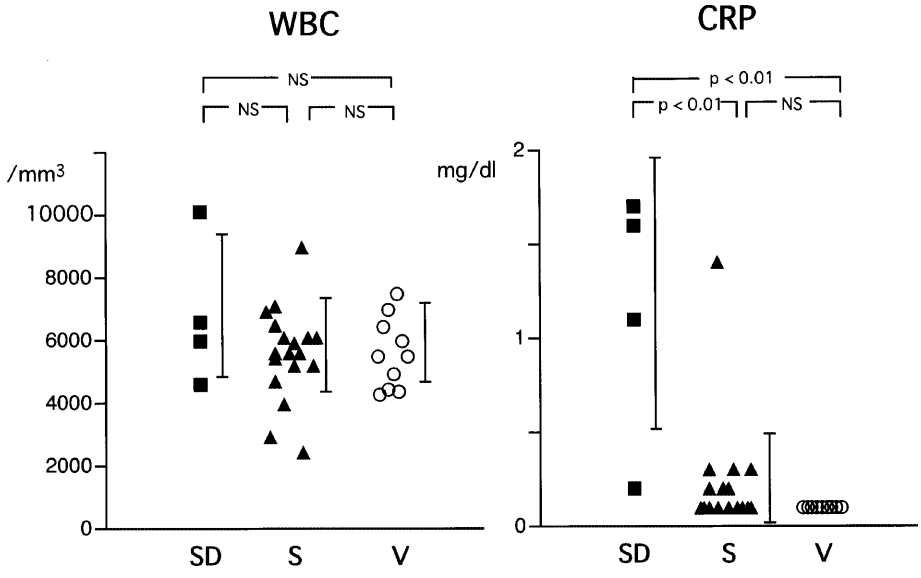

Fig. 2. Inflammatory markers in patients with varicose veins. *WBC*, white blood cells; *CRP*, C-reactive protein

with both DVT and STP were significantly higher than those in the patients with STP or in the patients with varicose veins only. These markers tended to be elevated in patients with STP without concomitant DVT, although not significantly, compared with the patients who had varicose veins only. The WBC counts did not differ significantly among the groups.

Treatment

Of 51 patients with STP, 45 underwent high ligation at the saphenofemoral junction and stripping of the greater saphenous vein with local excision of varices (Table 3). Three of the six patients with confirmed DVT were treated with heparin and urokinase. One patient was treated only with heparin due to the presence of puerperium, and another patient refused surgery and treatment was converted to heparin and urokinase.

Discussion

STP is often present in patients with large varicose veins.[8] In fact, we diagnosed STP in 51 (7.2%) of 710

Table 3. Treatments performed

Surgical	39
Stripping + varicectomy	39
Medical	6
(Reason)	
DVT	2
Puerperium	1
Patient's refusal of surgery	1

patients with varicose veins in the present series. In patients without varices, STP is considered to be indicative of underlying systemic disorders such as a tumor, collagen disease, Burger's disease, or myeloproliferative disease.[9–11] However, in our series more than 40% of patients with STP associated with varices also had systemic diseases, among whom four had malignant tumors. It is noteworthy that two of these four patients were diagnosed with stomach cancer or prostate cancer by systemic investigation after being examined for STP at our clinic. Therefore, it is important to be aware of the possibility of underlying systemic disorders when treating STP in patients with or without varicose veins.

It is also important to be aware of concurrent DVT. Several studies have reported an association between DVT and STP. However, the frequency of DVT in these reports ranges widely, from 5.6% to 44%,[1–6] the reason for this remains unclear, although we speculate that variations in the methods used to detect DVT such as venography, impedance plethysmography, or duplex scanning might account for the difference. The presence or absence of varicose veins may affect the association of DVT with STP. Varicose veins are considered to be a risk factor in the development of DVT,[12] although there might be a tendency for the frequency of concurrent DVT to increase in STP patients without varicose veins.[13] In this study, 11.8% of the patients with STP were identified as having DVT by duplex scanning, this percentage being lower than those in previous reports on the occurrence of DVT in STP patients without varicose veins.[2,14] While this discrepancy may be attributable to differences in the methods used to detect DVT, we also hypothesized that the presence of varicose veins may not increase the risk of concurrent DVT associated with STP. Using lung perfusion scans, we identified PE in four of our six patients with DVT, but since we performed the perfusion scan only for patients with verified DVT, we could not confirm the frequency of PE among all the patients with STP. Moreover, the diagnosis of PE might be confirmed by performing additional pulmonary artery angiography and computed tomography scan. It is interesting that none of the patients with STP in the tributaries of the saphenous vein had DVT. Therefore, DVT or a thrombus in either the greater or lesser saphenous vein may be an indication for lung perfusion scan screening for PE.

Recently, the diagnosis of both STP and DVT has become easier, especially with the use of duplex scanning. Since we found thrombi in varicose veins intraoperatively in three patients in this study, we analyzed the changes in coagulofibrinolytic or inflammatory markers to determine whether these markers were useful for the preoperative diagnosis of STP in patients with varicose veins. We found that the coagulofibrinolytic markers of FDP-DD, PIC, and TAT were all elevated in patients with both STP and DVT. The measurement of FDP-DD is now widely recognized for screening DVT with high sensitivity and it is useful to investigate the presence of DVT among patients with varices by measuring FDP-DD. Although we cannot completely rule out the possibility that the elevation of these markers reflected underlying systemic disese in 40% of the STP patients with such diseases, there was no significant difference in the level of the markers between STP patients with and without systemic diseases. Therefore, the elevated markers were considered to have been caused by the occurrence of STP and/or DVT. These markers were higher in the patients with STP than in those with varicose veins only, and we suggest that the measurement of these markers in combination with duplex scanning may be useful to preoperatively identify patients with STP and DVT. It was speculated that the elevation of coagulofibrinolytic markers in patients with STP plus DVT was due to the increased mass of thrombus since these markers are considered to correlate with the amount of thrombus in patients with DVT; however, the mechanism of concomitant DVT with STP is unknown. In this study, DVT was not identified in any patients with STP in the saphenous vein tributaries, but every case of DVT involved a patient with STP in the main trunks of the saphenous veins. Thus, the concomitance of DVT with STP is probably due to the geographic location of a thrombus extending to the deep veins rather than to hypercoagulable states. With regard to inflammatory markers, CRP, but not WBC counts, may also be useful to detect thrombi in varicose veins because the levels of CRP were increased in our patients with STP. Previous studies have also reported an elevation of CRP in patients with DVT, and we suggest that the measurement of CRP as well as FDP-DD in patients with varicose veins may help to diagnose concomitant STP and DVT.[15,16] Further studies involving a larger number of patients and a more detailed analysis of periodical changes of these markers after the onset are needed to confirm these findings.

We treated 45 of the 51 patients with STP concomitant with varicose veins by stripping the affected veins, following which there were no serious postoperative complications. In many hospitals, STP is treated symp-

tomatically, with analgesics, local heat therapy, elastic compression, and anti-inflammatory drugs; however, there is no standardized treatment for the disease. Belcaro et al.[11] first performed a randomized, controlled study to evaluate the effectiveness of various treatments for patients with STP and varicose veins. They showed that stripping the affected veins resulted in the lowest incidence of thrombus extension in comparison to elastic compression, or anticoagulant therapy. We support the use of surgical treatment, especially when the STP involves the greater or lesser saphenous vein, because the thrombus can extend toward the saphenofemoral or saphenopopliteal junction, which creates a risk of PE.

In conclusion, we reviewed 51 patients with varicose veins and STP. Many patients with STP may have systemic disorders, including previously undetected malignancies, as seen in this study. DVT and subsequent PE can occur in patients with a thrombus in the greater or lesser saphenous vein. The measurement of coagulofibrinolytic markers such as FDP-DD, PIC, and TAT, as well as CRP, in combination with duplex scanning, may be useful in the diagnosis of STP and concomitant DVT.

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