



Veins in Turmoil: Systemic Vasculitis-Induced Venous Incompetence in a Case of Leptospira and Scrub Typhus Co-Infection: A Case Report

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Abstract

A 48-year-old male presented with acute undifferentiated febrile illness complicated by a dual infection with leptospirosis and scrub typhus, manifesting with prolonged fever, rash, bilateral lower limb edema, thrombocytopenia, and acute liver injury. The patient had a history of recent travel and an unknown insect bite. On examination, bilateral pitting pedal edema, erythematous plaques, conjunctival suffusion, and a healing arthropod bite were noted. Laboratory results showed severe thrombocytopenia, elevated liver enzymes, and positive serology for both leptospirosis and scrub typhus. Imaging with Doppler ultrasound revealed venous insufficiency with left saphenofemoral junction incompetence and multiple varicosities. The patient was treated with doxycycline and ceftriaxone, along with supportive care, resulting in gradual resolution of fever, myalgia, and pedal edema.

This case highlights the overlapping clinical features and seasonal epidemiology of leptospirosis and scrub typhus, zoonotic infections that may lead to systemic vasculitis affecting multiple organs including the venous system. The inflammatory vasculitis likely contributed to transient venous insufficiency causing pedal edema and varicosities, as confirmed by duplex imaging that later normalized with clinical recovery. The report emphasizes the diagnostic challenge posed by coinfections and the importance of considering tropical febrile illnesses with vasculitic manifestations in endemic areas. It also discusses the pathogenetic mechanisms linking vasculitis and venous insufficiency and the need for further research on their interplay. Early recognition and combination antibiotic therapy led to a favorable outcome in this complex clinical scenario.

This case adds to the limited literature on scrub typhus and leptospirosis coinfection presenting with atypical venous pathology and underscores the value of detailed clinical and radiological assessment in febrile patients with edema and rash.

Keywords: Leptospira; Scrub typhus; Vasculitis; Venous Insufficiency; Duplex Ultrasound; Inflammation

1. Introduction

Superficial venous disease of the leg is common, disabling, and costly, and it has a negative effect on patients' quality of life [1].

A positive family history, increasing age, and pregnancy are known risk factors for developing superficial venous incompetence. Controversial risk factors are obesity, standing for long periods of time, and decreased mobility [2].

Patients may have aching, itching, cramps, swelling, and restless legs, which are relieved by walking. Symptoms are mostly worse during the evening and night. Clinical signs vary from small reticular veins and varicosities, to oedema,

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eczema-like skin changes, and venous ulcers. The gold standard for diagnosis of superficial venous incompetence is duplex ultrasound to identify valve incompetence. The sensitivity of duplex ultrasound for the great and small saphenous vein varies between 91% and 95%. The specificity varies between 95% and 100% [3]. The venous anatomy of lower limb is given in Figure 1 [4].

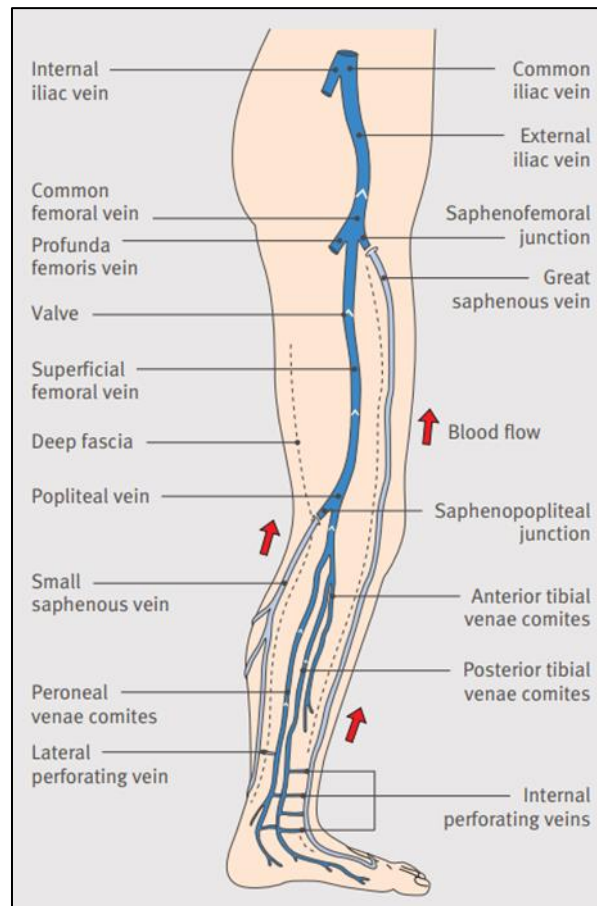


Figure 1 Venous anatomy of the lower limb

Classification of venous disease The CEAP (clinical, (a)etiology, anatomy, pathophysiology) classification is used for the clinical description of venous disease in general and can be used for superficial venous incompetence [5]. The “C” part of the classification is most useful for rating the clinical severity of venous disease and ranges from C0 to C6 (table). The aetiology of superficial venous incompetence is often unknown. The anatomy and pathophysiology of venous disease can be described only after venous duplex ultrasound [2].

Table 1 The C (Clinical) classification adapted from CEAP (clinical, (a)etiology, anatomy, pathophysiology) classification of venous disease

C0	No visible signs of venous disease
C1	Telangiectases or reticular veins
C2	Varicose veins
C3	Oedema
C4	Skin changes, lipodermatosclerosis
C5	Healed ulcer
C6	Active ulcer

Though the exact etiology of Venous Insufficiency of lower limbs is unclear, the primary underlying mechanism is believed to be valvular reflux. Other mechanisms include venous outflow obstruction, arteriovenous malformation, and calf muscle pump failure. These etiologic factors can lead to chronic endothelial inflammation and other pathophysiologic changes [6]. The following risk factors are associated development of venous insufficiency: Advanced age (that is aged 55 or older), Family history of varicose veins or venous pathology, Obesity, Oral contraceptive use, Tobacco use, Pregnancy, History of deep vein thrombosis or thrombophlebitis, History of the leg injury, Prolonged standing or sitting, Sedentary lifestyle, Female sex [6].

2. Case report

2.1. History

A 48-year-old male with no prior medical conditions presented with a high-grade intermittent fever lasting about 10 days accompanied by chills. Additional symptoms included a generalized rash beginning on the fourth day of fever, bilateral lower limb edema up to the thighs, sore throat, and eye redness. The patient recently travelled from Uttar Pradesh to Kashmir and reported an unknown bite 18-20 days before hospital admission.

2.2. Physical examination

Physical examination revealed mild dehydration and bilateral pitting pedal edema. Vital signs showed mild fever (100°F), stable blood pressure, elevated pulse rate, and normal oxygen saturation.

Bilateral lower limbs, Upper limbs and trunk showed numerous small, punctate, reddish-brown scattered spots. These lesions were discrete and varied in size, with some clustering observed, and were consistent with petechiae or hemorrhagic macules. There was mild background erythema but no evidence of necrosis, ulceration, or significant swelling. (Figure 2)

Bilateral pitting pedal edema present left more than right, extending up to the thigh, suggesting significant fluid retention likely due to systemic or local causes affecting venous or lymphatic drainage. (Figure 3)



Figure 2 Punctate hemorrhagic Spots



Figure 3 Pedal edema

Multiple small, well-defined erythematous and scaly plaques with mild crusting were present below the lower lip and bilaterally near the mouth angles, while the surrounding skin appeared normal.

Oral examination revealed erythema of the inner lips and perioral mucosa, with congested tonsils, inflamed uvula, and a nodular, congested posterior pharyngeal wall.

There was marked redness and hyperemia of the conjunctival mucosa in both eyes, indicating pronounced conjunctival suffusion.

A well-defined, dark, round papule measuring 1 cm × 1 cm was observed above the left medial malleolus with mild surrounding erythema, consistent with a healing arthropod bite without secondary infection or necrosis.

The genital lesion showed redness and swelling over the glans and preputial skin, consistent with balanitis and posthitis, without ulceration or discharge.

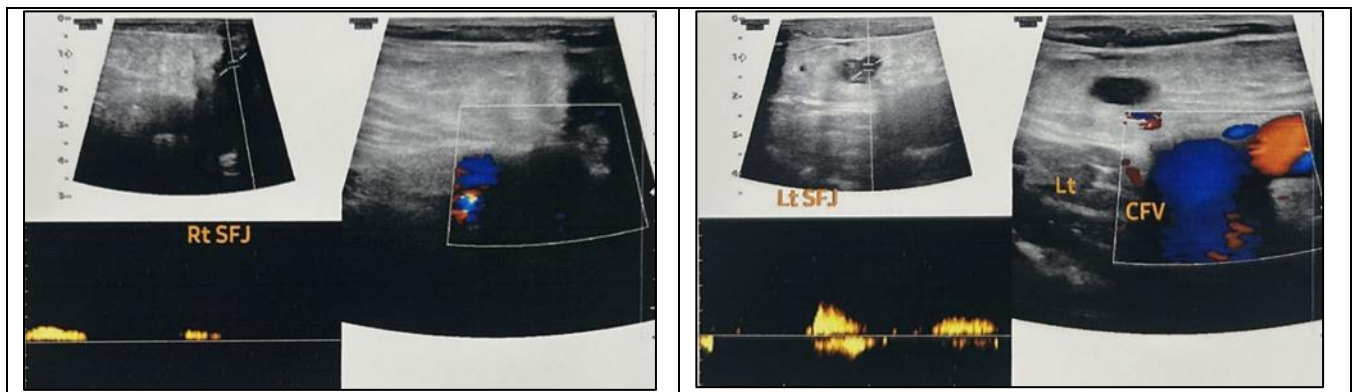
Abdominal examination revealed splenomegaly with a palpable, soft spleen tip just beneath the left costal margin and no splenic rub or bruit detected. Chest, cardiovascular, and neurological exams were normal.

2.3. Investigations

Initial blood tests indicated anemia (Hb 10.4 g/dl), normal white blood cell count, severe thrombocytopenia (platelets $31 \times 10^9/L$), mild hyponatremia, normal renal function, but elevated liver enzymes (SGOT 138 U/L, SGPT 130 U/L) and increased inflammatory markers (CRP 80 mg/L).

Infectious disease screening for dengue and typhoid was negative. Given the clinical presentation and lab findings, differential diagnoses considered included a range of infectious causes such as dengue, meningococemia, Kawasaki disease, Epstein-Barr virus, various rickettsial infections (including scrub typhus and Rocky Mountain spotted fever), leptospirosis, and ehrlichiosis, as well as hematologic or immunologic conditions like immune thrombocytopenic purpura and hemophagocytic syndrome. Drug reactions and multisystem inflammatory syndromes were also considered.

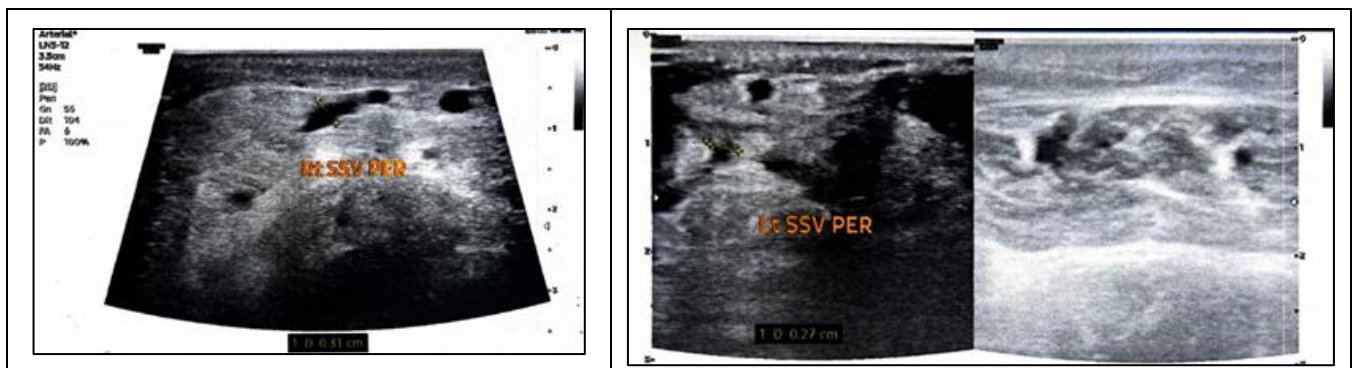
Color Doppler Flow Imaging of both lower limbs was done, which revealed incompetent left Saphenofemoral Junction with multiple varicosities along bilateral great saphenous vein and short saphenous vein. (Figure 4 and 5).



*CDFI - Color Doppler Flow Imaging; SFJ - SaphenoFemoral Junction; SGV - Great Saphenous Vein;

Left SFJ is mildly incompetent. Multiple varicosities noted along left GSV in calf region with two midcalf incompetent perforators measuring 3.7 mm and 3.3 mm in diameter.

Figure 4 CDFI images - Right SFJ is competent. Few varicosities noted along right GSV in calf region with a midcalf incompetent perforator measuring 3.1 mm in diameter



** CDFI - Color Doppler Flow Imaging; SSV – Short Saphenous Vein

Few varicosities noted along right SSV in lower calf region with a lower calf incompetent perforator measuring 2.7 mm in diameter.

Figure 5 CDFI images - Both SSVs show vein of Giacomini variant. Few varicosities noted along right SSV in calf region with a midcalf incompetent perforator measuring 3.1 mm in diameter

2.4. Course in hospital

Patient was provisionally diagnosed as a case of acute undifferentiated febrile illness and was started on antibiotics (Ceftriaxone and Doxycycline) in view of acute liver injury after sending routine investigations and fever workup including blood culture.

Further infectious workup was focused on scrub typhus and leptospira testing due to the travel history and unknown bite. Additionally, given the genital lesions, tests for sexually transmitted infections including HIV, VDRL, and herpes simplex virus were ordered to rule out related etiologies. Malaria, dengue, and enteric fever were excluded based on initial testing. This comprehensive evaluation highlights the complexity in diagnosing febrile illnesses with rash and multiple systemic symptoms, requiring careful consideration of infectious and non-infectious etiologies.

Table 2 Relevant Investigations of Index Case

Serial No	Investigation	Result
1	Malaria (MP Paracheck)	Negative
2	Dengue NS1 Ag	Negative

3	Dengue IgM	Negative
4	WIDAL	Negative
5	Typhi Dot IgM	Negative
6	Chest X Ray PA view	Within Normal Limits
7	Urine Routine Examination	Within Normal Limits
8	Electrocardiogram	Normal Sinus Rhythm
9	Leptospira IgM (ELISA)	Positive – 14.31 NTU (Negative <9; Positive>11)
10	Scrub Typhus IgM (ELISA)	Positive – 14.36 S/CO (Negative <9; Positive>11)
11	Leptospira PCR	Positive
12	Scrub Typhus PCR	Positive
13	Blood Culture	No growth
11	HIV I & II Antibody	Negative
12	HSV I & II (CLIA)	Negative
13	Peripheral Blood Smear	RBC – Predominantly Normocytic Normochromic; WBC – Count – 10500/microL; Neutro – 54%; Lympho – 33%; Mono – 12%; Eos – 01%; No atypical cells seen. Platelets – 80,000/ microL; Impression: Thrombocytopenia with Monocytosis.
14	USG Abdomen	Grade I Fatty Liver, Splenomegaly (14 cm), Right renal cysts (largest 24 x 21 mm) and concretions

Fever workup came out to be positive for scrub typhus by immunoassay technique. Also, immunoglobulin IgM ELISA leptospirosis came to be positive. Antibiotics were continued for a course of 07 days. Over the course of hospital stay he developed intermittent spikes of fever in the initial 2-3 days. Gradually appetite improved. Myalgia responded. General condition improved over a course of 5-7 days.

Pedal edema subsided over course of illness, that is, over 5-7 days. This prompted a relook at the color flow duplex imaging of both lower limbs of the patient. (Figure 6, 7 and 8)

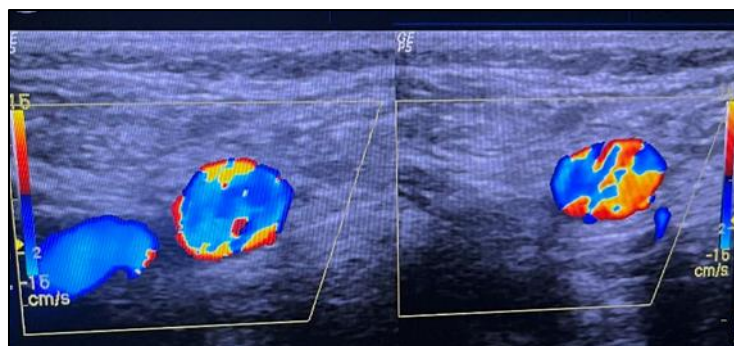


Figure 6 Color Doppler Flow Imaging – Right side – Common Femoral Artery and Vein. Left side – Compressed common femoral vein and patent common femoral artery

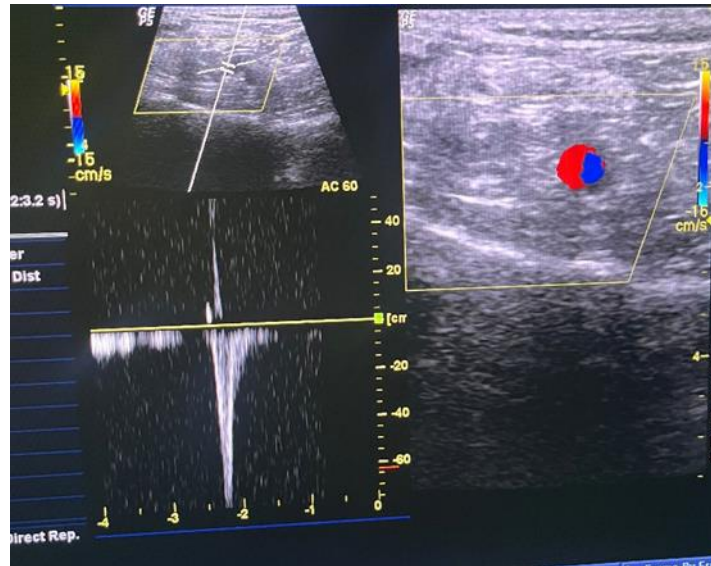


Figure 7 Color Doppler Flow Imaging – Right side – Popliteal vein showing normal doppler spectrum and response to distal augmentation. Left side – Compressed popliteal vein and patent popliteal artery

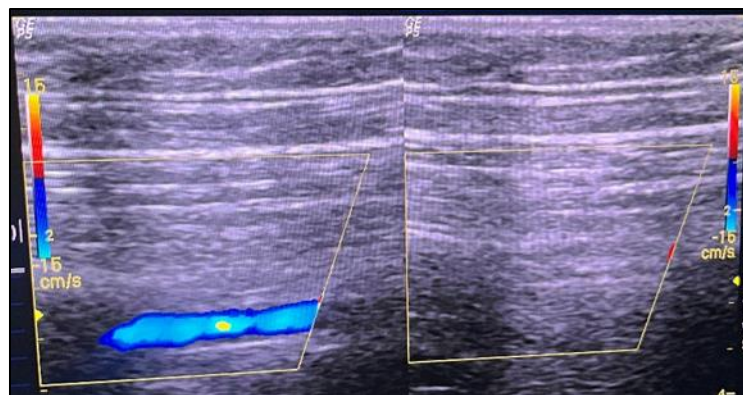


Figure 8 Color Doppler Flow Imaging – Right side – Patent superficial femoral vein. Left side – Compressed superficial femoral vein

Patient improved over the course of hospital stay; symptoms/signs resolved with no further fever spikes. Patient was discharged with final diagnosis of coinfection with leptospirosis and scrub typhus.

3. Discussion

We hypothesize, our case had presented with symptoms of both diseases, of leptospirosis in form of acute undifferentiated fever, myalgia, acute liver injury, and of scrub typhus in form of prolonged fever and thrombocytopenia. The patient responded to doxycycline, ceftriaxone and supportive treatment.

Leptospirosis and scrub typhus are often overlooked tropical diseases that share similar seasonal patterns and have rodents as a common reservoir. Their overlapping epidemiology increases the likelihood of simultaneous infections with both pathogens [7].

Both leptospira and Scrub Typhus are causes of infective systemic vasculitis that affects multiple organ systems. In the skin, it causes leakage of blood vessels leading to symptoms such as rash and purpura. Edema may be evident over skeletal muscles. Capillary leakage can result in hypovolemia and shock, posing serious risks to the patient. Additionally, leptospirosis can cause coagulation abnormalities, including disseminated intravascular coagulation (DIC), hemolytic

uremic syndrome (HUS), and thrombotic thrombocytopenic purpura (TTP), which further complicate the clinical picture and may contribute to increased morbidity and mortality.

The CVI is a relatively common condition seen worldwide and also in the Indian population. The most common manifestations of chronic venous disease are dilated cutaneous veins, such as telangiectasis and reticular veins, and varicose veins [8].

A vasculitis is a heterogeneous group of disorders that destroy blood vessels by inflammation and necrosis of blood vessel walls. Both arteries and veins are affected. It can range from being a rather benign condition to being a life-threatening entity with multiorgan involvement. The aetiology of vasculitis is unknown but is generally considered to involve a complex interaction between an environmental trigger factor (e.g. drugs, infection, chemicals, ultraviolet light, smoking) and a genetically predisposed host. In India, vasculitis is underdiagnosed and under-reported and its role in patients with chronic venous ulcers is yet to be fully understood [9].

Venous insufficiency is often caused by valve dysfunction or obstruction, while vasculitis is caused by inflammation of the blood vessels. While both conditions can cause swelling and pain, vasculitis can also cause symptoms such as fever, fatigue, and organ damage. However, there is limited research on the similarities and differences between venous insufficiency and vasculitis, highlighting the need for further studies to better understand these conditions and their treatment options.

Here, we hypothesize that the patient had dual infection with *Leptospira* and Scrub Typhus which led to vasculitis of lower limb veins. This led to venous insufficiency which manifested in the form of pedal edema due to saphenofemoral incompetence on the left and varicosities in both lower limbs. These changes were however transient. As the patient gradually improved from his illness, features of pedal edema subsided, evidenced by repeat duplex imaging of both lower limbs showing no further venous incompetence/ varicosities.

Abbreviations

- CVI: Chronic Venous Insufficiency
- CEAP: Clinical, Etiology, Anatomy, Pathophysiology (classification of venous disease)
- IgM: Immunoglobulin M
- PCR: Polymerase Chain Reaction
- DIC: Disseminated Intravascular Coagulation
- HUS: Hemolytic Uremic Syndrome
- TTP: Thrombotic Thrombocytopenic Purpura
- CRP: C-Reactive Protein
- SGOT: Serum Glutamic-Oxaloacetic Transaminase
- SGPT: Serum Glutamic-Pyruvic Transaminase
- TLC: Total Leukocyte Count
- SFJ: Saphenofemoral Junction
- GSV: Great Saphenous Vein
- SSV: Short Saphenous Vein
- CT: Computed Tomography
- USG: Ultrasonography
- ELISA: Enzyme-Linked Immunosorbent Assay

4. Conclusion

This case illustrates a rare and diagnostically challenging presentation of systemic vasculitis-induced venous incompetence secondary to co-infection with leptospirosis and scrub typhus. The overlapping clinical manifestations of these tropical infections can obscure timely diagnosis, particularly in endemic regions. Prompt identification of infectious vasculitis and its venous complications facilitated the initiation of appropriate combined antimicrobial therapy, resulting in complete resolution of venous insufficiency and associated symptoms. This report underscores the importance of considering infectious etiologies in patients presenting with unusual venous pathology in the context of febrile illnesses. Moreover, it highlights the need for heightened clinical awareness and further investigative studies to elucidate the pathophysiological mechanisms linking infectious agents and vascular inflammation, thereby informing improved diagnostic and therapeutic approaches to optimize patient outcomes.

Compliance with ethical standards

In accordance with the ICMJE uniform disclosure requirements, the authors declare the following:

- **Payment/services:** No financial support was received from any organization for the submitted work.
- **Financial relationships:** The authors report no financial relationships, either current or within the past three years, with organizations that could have an interest in this work.
- **Other relationships:** The authors also declare no other relationships or activities that could be perceived as influencing the submitted work.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of Ethical Approval

Ethical approval was not applicable for this case report as it does not constitute a research study. Patient informed consent for publication of clinical details and images was obtained.

Statement of informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

References

- [1] Carradice, D., Mazari, F.A., Samuel, N., Allgar, V., Hatfield, J. & Chetter, I.C. (2011) Modelling the effect of venous disease on quality of life. *British Journal of Surgery*, 98, 1089–1098. DOI: 10.1002/bjs.7500, PubMed: 21604256.
- [2] Lim, C.S. & Davies, A.H. (2009) Pathogenesis of primary varicose veins. *British Journal of Surgery*, 96, 1231–1242. DOI: 10.1002/bjs.6798, PubMed: 19847861.
- [3] Mercer, K.G., Scott, D.J. & Berridge, D.C. (1998) Preoperative duplex imaging is required before all operations for primary varicose veins. *British Journal of Surgery*, 85, 1495–1497. DOI: 10.1046/j.1365-2168.1998.00877.x, PubMed: 9823909.
- [4] Van den Boezem, P.B., Klem, T.M., le Cocq d'Armandville, E. & Wittens, C.H. (2011) Cite this as. *BMJ*, 343, d4489. DOI: 10.1136/bmj.d4489, PubMed: 21816743.
- [5] Eklöf, B., Rutherford, R.B., Bergan, J.J., Carpentier, P.H., Gloviczki, P., Kistner, R.L., Meissner, M.H., Moneta, G.L., Myers, K., Padberg, F.T., Perrin, M., Ruckley, C.V., Smith, P.C., Wakefield, T.W. & American Venous Forum International Ad Hoc Committee for Revision of the CEAP Classification (2004) Revision of the CEAP classification for chronic venous disorders: Consensus statement. *Journal of Vascular Surgery*, 40, 1248–1252. DOI: 10.1016/j.jvs.2004.09.027, PubMed: 15622385.
- [6] Bonkemeyer Millan, S., Gan, R. & Townsend, P.E. (2019) Venous ulcers: Diagnosis and treatment. *American Family Physician*. [PubMed], 100, 298–305. PubMed: 31478635.
- [7] Watt, G., Jongsakul, K. & Suttinont, C. (2003) Possible scrub typhus coinfections in Thai agricultural workers hospitalized with leptospirosis. *American Journal of Tropical Medicine and Hygiene*, 68, 89–91. DOI: 10.4269/ajtmh.2003.68.89, PubMed: 12556154.
- [8] Eberhardt, R.T. & Raffetto, J.D. (2005) Chronic venous insufficiency. *Circulation*, 111, 2398–2409. DOI: 10.1161/01.CIR.0000164199.72440.08.
- [9] D'Cruz, D. (2000) Autoimmune diseases associated with drugs, chemicals and environmental factors. *Toxicology Letters*, 112–113, 421–432. DOI: 10.1016/s0378-4274(99)00220-9, PubMed: 10720762.