Foreign body causing superficial venous thrombosis and subsequent pulmonary embolism: a case report

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Background
Superficial venous thrombosis (SVT) is common, but often perceived to be a non-serious condition. This pathology should not be overlooked as it can lead to complications that may require anticoagulation. We present a case of SVT complicated by pulmonary embolism (PE) revealing an unexpected cause.

Case summary
A 41-year-old woman was admitted to the emergency department for chest pain and intense sudden pain of the left groin, revealing an extended great saphenous SVT associated with a PE. Further investigation showed that the thrombosis was caused by a sewing needle located between the superficial femoral artery and the femoral vein. Successful extraction was performed in a vascular surgery unit.

Discussion
Superficial venous thrombosis can be associated with deep venous thrombosis and PE, and can be caused by local inflammation, direct compression, and foreign bodies. These aetiologies should be investigated if no evident cause to SVT is found.

Keywords
Case report • Foreign body • Superficial venous thrombosis • Pulmonary embolism

Introduction
Superficial venous thrombosis (SVT) is common, but often under-treated. The underlying pathophysiological mechanisms are intimal damage, blood stasis, or an anomaly in coagulation. The main causes are venous insufficiency, traumatic, or iatrogenic. There is often no apparent cause. However, complications can occur: recurrence, post-phlebitic syndrome. Some require anticoagulation like deep venous thrombosis (DVT) or pulmonary embolism (PE). Therefore, this pathology should not be overlooked. Detailed clinical and radiologic assessment should be performed if no evident cause is found, in search of an underlying mechanism. We present a case of SVT complicated by PE, revealing an unexpected cause.

Learning points
• Mostly considered a benign pathology, superficial venous thrombosis (SVT) can be complicated by deep venous thrombosis and pulmonary embolism.
• Local causative factors of SVT (e.g. compression, foreign body, local inflammation) should be investigated if no obvious cause is found, as there may be a reversible underlying mechanism.
## Timeline

| Day | Events |
|-----|--------|
| 1   | Patient admitted to the emergency department with intense sudden pain of the left groin associated with right-sided chest pain. Normal electrocardiogram, troponin, and brain natriuretic peptide. Raised D-Dimers. Left great saphenous obstructive superficial venous thrombosis extending through the entire thigh found on the Venous Doppler ultrasound. Middle and inferior right lobes pulmonary embolism found on the computed tomography (CT) angiography. Treatment by subcutaneous low-molecular weight heparin. |
| 2   | Thrombophilia blood tests negative |
| 3   | Oral anticoagulation initiated |
| 5   | Discharge from the cardiology department |
| 6   | Abdominal-pelvic CT scan to rule out neoplastic aetiology performed—4-cm long extra-vascular foreign body between the left superficial femoral artery and femoral vein found. Hospitalization. Oral anticoagulation switched to unfractionated heparin; antibiotics administered. |
| 9   | Transfer to the cardiac surgery department |
| 10  | Foreign body extracted in a vascular surgery unit; the left saphenofemoral junction ligated simultaneously |

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## Case summary

A 41-year-old woman was admitted to the emergency department on 1 October 2017 for pain of the left groin associated with right-sided chest pain.

Her medical history included sclerotherapy for venous insufficiency with saphenectomy (1997), chronic alcohol consumption (around 7 units per day for about 10 years), current smoking (1 pack per day for 25 years), and depression. There was no use of intravenous drugs.

During admission: blood pressure 107/71 mmHg, heart rate 74/min, temperature 37.0°C, and oxygen saturation 98%. Heart sounds were regular without murmur. There was no sign of heart failure. Pulmonary auscultation was normal and there was no dyspnoea. She presented a pain of the left groin and a moderate, sharp right-sided chest pain radiating to the scapula. Both appeared suddenly the day before. The groin pain was intense, without radiation and increased at palpation. Groin examination found an induration without inflammation. Neurological examination of the leg was normal.

The electrocardiogram found a sinus rhythm, normal axis, no conduction or repolarization anomaly, no sign of right ventricular overload. D-dimers were elevated [7.8 nmol/L; upper limit of normal (ULN) = 3 nmol/L], troponin I us was negative, B-type natriuretic peptide was within normal limits (22 ng/L, ULN = 100 ng/L). There was a moderate biological inflammatory syndrome (white blood cells $14.5 \times 10^9/L$, ULN = $10 \times 10^9/L$; C-reactive protein $3 \text{ mg/L}$, ULN = $0.5 \text{ mg/L}$) and BhCG were negatives. Venous Doppler ultrasound of the left leg diagnosed an obstructive great left SVT extending through the whole thigh (Figure 1). Right leg was not investigated at the time. No other local abnormality was found. Wells score for PE suggested intermediate risk (4). Computed tomography (CT) of pulmonary arteries revealed an endoluminal defect of the external middle lobar and inferior lobar arteries without anomaly of the pulmonary parenchyma, confirming the diagnosis of PE (Figure 2). No favouring factor was found (no immobilization, oral contraception, local trauma, recent surgery, or family history of thromboembolic event).

The patient was treated with subcutaneous low-molecular-weight heparin (Enoxaparin 60 mg twice a day for 2 days) followed by oral anticoagulation (Rivaroxaban 15 mg twice a day for 21 days, then 20 mg once a day) and compression stockings. An aetiological work up...
was performed with thrombophilia blood tests (antithrombin, protein C, protein S normal; no factor V or factor II mutation; no antiphospholipid antibody) and an abdominal-pelvic CT scan to rule out a neoplastic cause. The abdominal-pelvic CT scan was performed without emergency (6 October 2017), and revealed a 4-cm long extra-vascular foreign body lodged between the left superficial femoral artery and the femoral vein (Figure 3) not threatening the femoral nerve. The patient was hospitalized the same day and oral anticoagulation was switched to unfractionated heparin with the addition of antibiotics (Amoxicillin and Clavulanic acid 1000 mg three times a day till the extraction). The foreign body was extracted in a cardiac surgery unit on 10 October 2017, with ligation of the left saphenofemoral junction. There was no post-operative complication. The foreign body was a 4-cm sewing needle. It snapped during removal (Figure 4).

Despite our best efforts and careful interrogation, we could not explain how the needle got into the thigh and could only speculate on different theories. The patient was unaware of its presence and had no explanation to give.

She was followed-up in the haematology clinic (5 March 2018) with a Doppler ultrasound revealing a bilateral sural thrombosis without superficial thrombosis. Hence, anticoagulation was continued for 6 months.

**Discussion**

Few other cases reporting venous thrombosis due to a foreign body have been published. Bypareddy et al.\(^\text{1}\) reported the case of a 40-year-old man with post-traumatic cataract and an intraocular metallic foreign body in the retinal surface that caused a superotemporal...
branch retinal vein occlusion. Dorschner et al.\textsuperscript{7} reported the case of a 28-year-old man with superior mesenteric vein thrombosis. Endoscopic examination of the upper gastrointestinal tract showed a suppurative duodenitis caused by a toothpick perforating the intestinal wall. Lax-Pérezet et al.\textsuperscript{4} described a large psoas bursitis caused by polyethylene particles, which caused compression and thrombosis of the superficial femoral vein. Beksaç et al.\textsuperscript{5} reported a similar case, but the consequence of the bursitis was limited to compression.

In each of the aforementioned cases, the foreign body led to venous thrombosis. Two mechanisms to explain this relationship are direct compression and indirectly through local inflammation. Elevation of C-reactive protein, IL-6, IL-8, and tumour necrosis factor-alpha during a response to systemic inflammation have been associated with increased DVT risk.\textsuperscript{5} Activation of endothelial cells, platelets, and leucocytes can trigger the coagulation system through the induction of tissue factor. Inflammation of the vessel wall may initiate thrombosis on an intact vein. For our patient, the needle probably created local inflammation and favoured a hypercoagulation state in the superficial femoral vein, leading to SVT and furthermore to PE.

Currently, recommendations for SVT treatment is aimed at relieving local symptoms and preventing complications: local heat, anti-inflammatory agents, and compression. However, a study demonstrated that Fondaparinux at a dose of 2.5 mg once a day for 45 days was effective in the treatment of patients with acute, symptomatic SVT of the leg of at least 5 cm long; with the primary outcome being a composite of death from any cause, symptomatic PE, symptomatic SVT of the lower limb, and the link between arterial and venous thrombosis. The OPTIMEV study (n = 788) found that 28.8% of patients with an SVT also had a DVT.\textsuperscript{5}

The relationship between SVT, DVT, and PE has been investigated in two key studies. The Prospective observational superficial thrombophlebitis (POST) study (n = 844) demonstrated that SVT was related to concurrent DVT or PE in 24.9% of patients,\textsuperscript{7} while the OPTIMEV study (n = 788) found that 28.8% of patients with an SVT also had a DVT.\textsuperscript{9}

In the latest recommendations of the ESC on PE, a thoracoabdomino-pelvic CT scan is not mandatory after an isolated episode of PE as it didn’t show a benefit on 5-year survival compared with clinical evaluation. It is therefore recommended to perform a careful interrogation, physical examination, basic laboratory tests, and a chest X-ray.\textsuperscript{9}

The local symptoms were initially attributed to the thrombosis alone. Closer examination may have revealed the foreign body sooner. In cases of unexplained SVT, physicians should look closely into medical history and perform an advanced examination to look for a treatable cause.

**Conclusions**

We report the first case of precipitated SVT associated with PE due to a sewing needle. Most of the time considered as a benign pathology, SVT can be complicated by DVT and PE, and these complications should be investigated in the presence of related symptoms. Furthermore, local causative factors (e.g. compression, foreign body, local inflammation) should be investigated if no other cause is found.

**Supplementary material**

**Supplementary material** is available at *European Heart Journal - Case Reports* online.

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**Slide sets:** A fully edited slide set detailing this case and suitable for local presentation is available online as Supplementary data.

**Consent:** The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

**Conflict of interest:** none declared.

**References**

1. Byreddy R, Sagar P, Chawla R, Temkar S. Intraocular metallic foreign body causing branch retinal vein occlusion. BMJ Case Rep 2016.
2. Dorschner BW, Thouet RW, Zellweger U. Suppurative duodenitis and superior mesenteric vein thrombosis after toothpick ingestion. Clin Gastroenterol Hepatol 2015;13:A25–A26.
3. Lax-Pérez R, Salinas-Gilabert JE, Lajara-Marco F, Lax-Perez A, Corraliza-Zamorano A, Garcia-Galvez A. Superficial femoral vein thrombosis due to large polyethylene particles secondary to particle disease in total hip arthroplasty. Acta Ortop Mex 2012;26:316–319.
4. Beksaç B, Tozün R, Baktrıgolu S, Şener N, Gonzalez Della Valle A. Extravascular compression of the femoral vein due to wear debris-induced iliopsoas bursitis: a rare case of leg swelling after total hip arthroplasty. J Arthroplasty 2007;22:453–456.
5. Poredos P, Jezovnik MK. The role of inflammation in venous thromboembolism and the link between arterial and venous thrombosis. Int Angiol 2007;26:306–311.
6. Decousus H, Prandoni P, Mismetti P, Bauersachs RM, Bodas Z. Fondaparinux for the treatment of superficial-vein thrombosis in the leg. N Engl J Med 2010;363:1222–1232.
7. Decousus H, Quéré I, Presles E, Becker F, Barrelier M-T, Chanut M, Gillet J-L, Guenueguez H, Leandri C, Mismetti P, Pichot O, Leizorovitch A. Superficial venous thrombosis and venous thromboembolism: a large, prospective epidemiologic study. Ann Intern Med 2010;152:218–224.
8. Galanaud JP, Genty C, Sevestre MA, Brisot D, Lausecker M, Gillet J-L, Rolland C, Righini M, Leberthonis G, Bosson J-L. Quere I. The OPTIMEV study. Predictive factors for concurrent deep-vein thrombosis and symptomatic venous thromboembolic recurrence in case of superficial venous thrombosis. Thromb Haemost 2010;105:31–39.
9. Konstantinides SV, Torbicki A, Agnelli G, Danchin N, Fitzmaurice D, Galie N, Gibbs J, Huissman MV, Humbert M, Kucher N, Lang I, Lanket M, Lelakov J, Maack C, Mayer E, Meneguzzi N, Perner A, Pruszczak P, Rasmussen LH, Schindler TH, Svitil P, Vonk Noordegraaf A, Zamorano JL, Zompatori M. Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). 2014 ESC guidelines on the diagnosis and management of acute pulmonary embolism. Eur Heart J 2014;35:3033–3080.