

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

Marion Lebon¹, Yann Ancedy¹, Franck Boccara^{1,2,3}, and Ariel Cohen^{1,4*}

¹Department of Cardiology, APHP, Hôpital Saint-Antoine, Hôpitaux de l'Est Parisien, Service de Cardiologie, Université Pierre et Marie Curie (UPMC), Sorbonne Universités, 184, rue du faubourg saint Antoine, Paris Cedex 12, France; ²INSERM, Department UMR s938, Hôpital Saint-Antoine, 184, rue du Faubourg Saint-Antoine, Paris F-75012, France; ³Université Pierre et Marie Curie (UPMC), Sorbonne Universités, 4 Place Jussieu, 75005 Paris, France; and ⁴INSERM, Department U856, 47-83 Boulevard de l'Hôpital, 75013 Paris, France

Received 16 May 2018; accepted 1 October 2018; online publish-ahead-of-print 23 November 2018

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

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.

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 radiological 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.

* Corresponding author. Tel: +33 1 4928 2886, Fax: +33 1 4928 2884, Email: ariel.cohen@aphp.fr

Handling Editor: Gianluigi Savarese

Peer-reviewers: Dejan Milasinovic and John Kanakakis

Compliance Editor: Anastasia Vamvakidou

Supplementary Material Editor: Peregrine Green

© The Author(s) 2018. Published by Oxford University Press on behalf of the European Society of Cardiology.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

Timeline

Day Events

- | 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
Hospitalization. Treatment by subcutaneous low-molecular weight heparin. |
| 3 | Thrombophilia blood tests negative
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 |

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

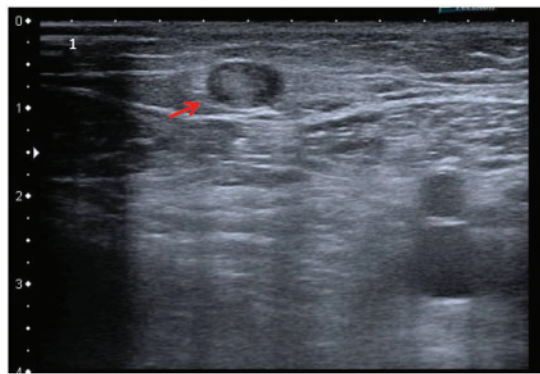


Figure 1 Doppler ultrasound showing a left saphenous obstructive superficial venous thrombosis. Red arrow pointing at the venous thrombosis.

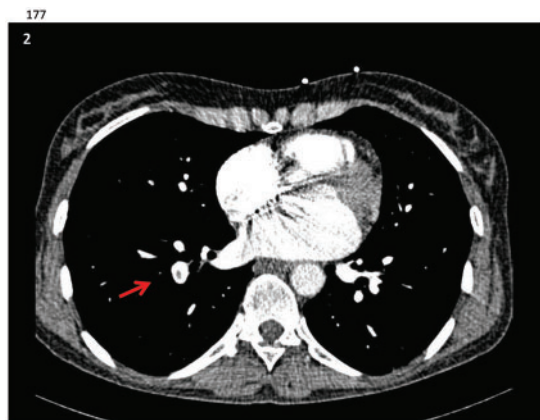


Figure 2 Computed tomography scan showing pulmonary embolism. Red arrow pointing at the pulmonary embolism.

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 mg/L ULN = 0.5 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 aetiologic work up

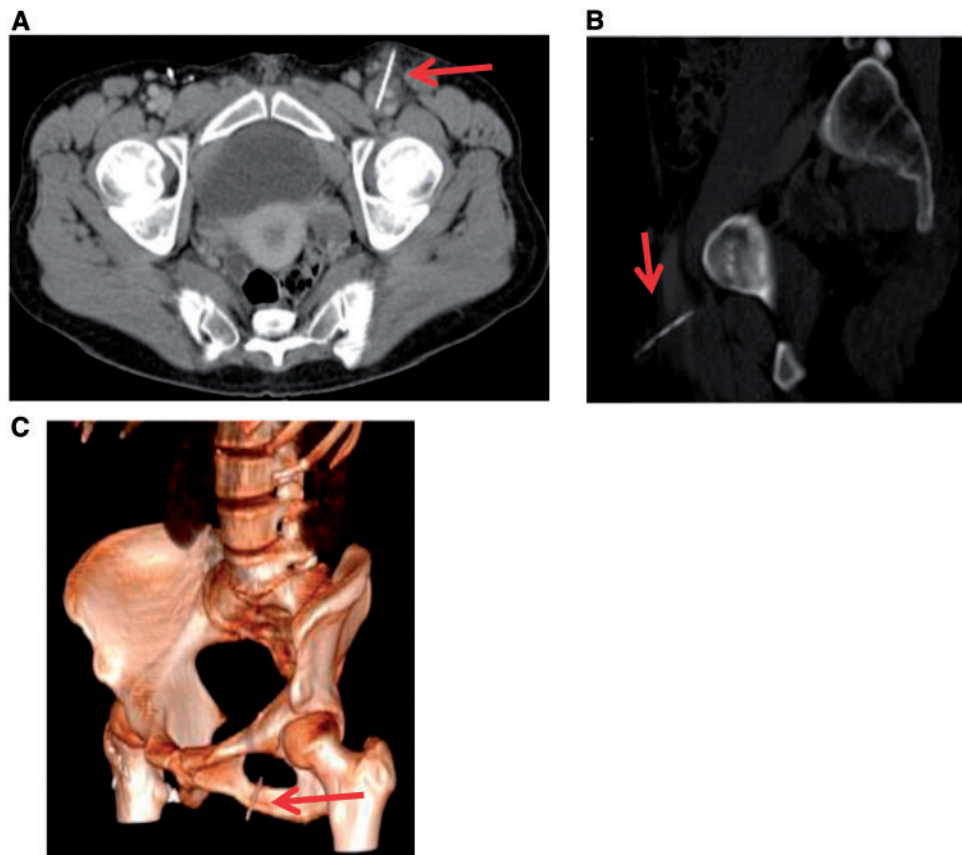


Figure 3 (A) Pelvic computed tomography scan, cross section; (B) pelvic computed tomography scan, sagittal section; (C) computed tomography scan, 3D reconstruction; showing a 4-cm long extra-vascular foreign body lodged in the Scarpa's triangle. (A-C) Red arrows pointing at the needle.

was performed with thrombophilia blood tests (antithrombin, protein C, protein S normal; no factor V or factor II mutation; no anti-phospholipid 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.



Figure 4 The removed foreign body—a 4-cm sewing needle.

Discussion

Few other cases reporting venous thrombosis due to a foreign body have been published. Bypareddy *et al.*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.*² 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-Pérez *et al.*³ described a large psoas bursitis caused by polyethylene particles, which caused compression and thrombosis of the superficial femoral vein. Beksaç *et al.*⁴ 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- α during a response to systemic inflammation have been associated with increased DVT risk.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 DVT, symptomatic extension to the saphenofemoral junction or symptomatic recurrence of SVT at Day 47.⁶

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,⁷ while the OPTIMEV study ($n = 788$) found that 28.8% of patients with an SVT also had a DVT.⁸

In the latest recommendations of the ESC on PE, a thoraco-abdomino-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.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.

Funding

Editorial support was provided by Jenny Lloyd (MedLink Communications Limited) and was funded by the authors.

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. Bypareddy 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-Gilbert JE, Lajara-Marco F, Lax-Pérez A, Corraliza-Zamorano A, García-Galvez A. Superficial femoral vein thrombosis due to large psoas bursitis secondary to particle disease in total hip arthroplasty. *Acta Orthop Mex* 2012;**26**:316–319.
4. Beksaç B, Tözün R, Baktiroglu S, Şener N, Gonzalez Della Valle A. Extravascular compression of the femoral vein due to wear debris-induced iliopsoas bursitis: a rare cause 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;**25**:306–311.
6. Decousus H, Prandoni P, Mismetti P, Bauersachs RM, Boda Z. Fondaparinux for the treatment of superficial-vein thrombosis in the legs. *N Engl J Med* 2010;**363**:1222–1232.
7. Decousus H, Quéré I, Presles E, Becker F, Barrellier M-T, Chanut M, Gillet J-L, Guennevez H, Leandri C, Mismetti P, Pichot O, Leizorovicz A. Superficial venous thrombosis and venous thromboembolism: a large, prospective epidemiologic study. *Ann Intern Med* 2010;**152**:218–224.
8. Galanaud J-P, Genty C, Sevestre M-A, Brisot D, Lausacker M, Gillet J-L, Rolland C, Righini M, Leftheriotis 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, Galiè N, Gibbs JS, Huisman MV, Humbert M, Kucher N, Lang I, Lankeit M, Lekakis J, Maack C, Mayer E, Meneveau N, Perrier A, Pruszczyk 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.