CASE REPORT

Endovascular management of a case of spontaneous retroperitoneal haematoma complicated with deep vein thrombosis and pulmonary embolism

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SUMMARY

Spontaneous retroperitoneal haematoma (SRH) can be a life-threatening emergency presenting with hypovolaemic shock. SRH has been rarely reported with May-Thurner syndrome (MTS) where it occurs due to rupture of the iliac vein or venous collaterals. We report a case of MTS that presented with deep venous thrombosis of the left lower limb complicated by bilateral pulmonary embolism (PE) and a large pelvic haematoma. The simultaneous occurrence of a large pelvic haematoma and PE offered a therapeutic challenge. Successful endovascular management of the case is discussed in this report.

BACKGROUND

Spontaneous retroperitoneal haematoma (SRH) is a rare clinical entity seen commonly after rupture of renal tumour, iatrogenic injury to pelvic vasculature or administration of anticoagulants.¹ Spontaneous rupture of iliac vein often with concomitant thrombophlebitis or deep venous thrombosis (75%) and May-Thurner syndrome (MTS; 25%) is noted as one of the rare causes of SRH.¹⁻⁴ SRH can have life-threatening consequences due to the risk of hypovolaemic shock.² SRH in association with MTS presents a therapeutic challenge as a life-threatening thrombotic condition coexists with significant bleeding.^{1,5} The management options have to be individualised and consist of conservative, endovascular and/or open surgical techniques.^{1,5} Successful management of one such case using endovascular and conservative measures is discussed in this report.

CASE PRESENTATION

Our patient, a 55-year-old woman, presented to us with a history of pain and swelling of the left lower limb of 7 days' duration, pain in the lower abdomen and dyspnoea of 3 days' duration. The pain abdomen was dull, continuous ache in the hypogastric region with no specific aggravating or relieving factors. Dyspnoea was brought about by minimal exertion and was not accompanied by cough or chest pain. There was no history of prolonged immobilisation, leg trauma or any other risk factor for venous thrombosis. She was a postmenopausal woman not on hormonal replacement therapy or any other drugs.

On clinical examination, she had tachycardia (130 beats/min), tachypnoea (34/min) and a blood

pressure of 104/70 mm Hg. She was hypoxaemic on room air (oxygen saturation was 88%), which improved with oxygen by face mask. Local examination of the lower limb revealed pitting pedal oedema of the left leg extending until the thigh. There was calf tenderness. The distal pulses of both lower limbs were normal and equal. There were no varicose veins, ulcerations or discolouration of the lower limb. Cardiovascular and other system examinations were unremarkable.

INVESTIGATIONS

Investigations revealed Hb of 10.2 g/dL and total leucocyte count of $14.6 \times 10^9/L$ with raised polymorphs (86%). The biochemical profile was normal. Coagulation profile showed normal prothrombin time and activated partial thromboplastin time. Her chest X-ray was normal and ECG showed sinus tachycardia. A venous Doppler of lower limb vessels showed evidence of deep vein thrombosis (DVT) extending from the left common iliac vein until the left peroneal and posterior tibial vein. Venous Doppler of the right lower limb was normal. Ultrasound of the abdomen revealed a pelvic mass measuring 11 cm x 7.2 cm x 8.5 cm.

CT scan of the abdomen and pelvis showed obstruction of the left common vein with thrombus, which was extending into the external iliac veins. In addition, it confirmed the presence of a pelvic mass.

A CT pulmonary angiography revealed evidence of acute bilateral pulmonary thromboembolism involving bilateral lobar and segmental branches of both lower lobes (figure 1). A wedge-shaped opacity in the lateral basal segment of the right lower lobe was also noted.

The exact aetiology of the pelvic mass was not clear from ultrasonography and CT scan abdomen. MRI of the abdomen was done subsequently, which confirmed the pelvic mass to be haematoma (figure 2). In addition, no other abnormality of any of the pelvic organs was noted. A diagnosis of SRH was made based on the MRI findings. Echocardiogram done showed normal biventricular function with no echocardiographic features to suggest pulmonary embolism.

DIFFERENTIAL DIAGNOSIS

Diagnosis of DVT along with pulmonary embolism was not difficult to establish in this 55-year-old woman presenting with painful

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Figure 1 CT pulmonary angiogram demonstrating thrombus in both branches (white arrows) of the pulmonary artery.

unilateral limb swelling along with dyspnoea. Differential diagnosis of pelvic mass included benign adnexal cyst, leiomyoma, pelvic malignancy, dermoid, pelvic inflammatory disease and pelvic haematoma. In the absence of any symptoms referred to the pelvis in the recent past and MRI suggestive of haematoma along with clear delineation of all the pelvic organs, a diagnosis of SRH was made. The presence of a left lower limb DVT along with PE made us consider the diagnosis of a MTS complicated with a SRH.

TREATMENT

The coexistence of a PE and SRH posed a therapeutic dilemma as regards the use of anticoagulant therapy. Priority and staged management were the keystones in our management strategy. Anticoagulant therapy was started with unfractionated heparin (UFH) in low dose (500 U/hour) under close observation. After 48 hours of close observation, there was no increase in the size

of the pelvic mass. In view of the large thrombus burden in the lower limb and symptomatic bilateral PE, it was decided to perform catheter-directed thrombolysis. Prior to starting catheter-directed thrombolysis, a retrievable vena caval filter was placed from the right femoral vein in the inferior vena cava (IVC) to prevent embolisation of thrombus from the left lower limb vein. Left popliteal vein puncture was done under Doppler guidance. A perfusion catheter was placed in the left common iliac vein through which alteplase in the dose of 1 mg/hour was started, and UFH was continued. Check venogram after 24 hours showed slight improvement in the flow; in addition, it demonstrated obstruction of the common iliac vein (figure 3A) suggestive of MTS. It was subsequently decided to perform balloon angioplasty of the left femoral, external iliac and common iliac veins. The left lower limb veins were sequentially dilated with 5 mm x 40 mm, 9 mm x 40 mm and 10 mm x 40 mm size rival balloons (Bard Peripheral Vascular, Tempe, Arizona, USA) at 6 atm pressure (figure 3B). Finally, the left common iliac vein was stented with 18 x 100 mm self-expanding Niti S vascular stent (Taewoong Medical Company, Seoul, South Korea). IVC filter was retrieved after 4 days. UFH was continued and close watch of the pelvic mass revealed no further increase in its size.

OUTCOME AND FOLLOW-UP

The patient showed significant improvement after the peripheral intervention with significant decrease in her left lower limb swelling and reduction of dyspnoea. She was subsequently switched over to direct-acting oral anticoagulant, and heparin was stopped. She became ambulant within 3 days of the intervention and was discharged in ambulant state on Apixiban 5 mg tablets twice daily. On 6 months' follow-up, the DVT and SRH have completely resolved and a repeat CT scan of the pelvis showed complete disappearance of the pelvic haematoma (figure 4).

DISCUSSION

Spontaneous retroperitoneal haematoma due to rupture of iliac vein is a rare disorder.^{1 4 5} It occurs commonly in postmenopausal women as was seen in this case report. It is commonly seen in association with DVT (75%) and MTS (28%) secondary to rupture of the common iliac vein or its collaterals.¹

MTS in our patient was diagnosed as she had proximal DVT with demonstrable obstruction of the left common iliac vein on venogram. The presentation of SRH can be catastrophic with severe hypovolaemia and shock or can be less devastating with pain abdomen as was noted in our patient.^{1 4-6} SRH in our patient was attributed to rupture of the venous varix resulting from the underlying left common iliac vein DVT. The common occurrence of DVT and SRH together is not understood. However, it is known that long-standing venous obstruction leads to dilation of collateral venous channels secondary to weakening of the vessel wall promoted by long-standing thrombophlebitis and loss of oestrogenic effect.⁶ These thin-walled varices with high radial tension are prone to rupture particularly following activities that increase the venous pressures.^{1 6} It is not known whether DVT is the cause of iliac vein rupture or a consequence of it.

Management of SRH is primarily governed by the haemodynamic status of the patient.⁴⁻⁷ Several treatment options are available for these patients, which include conservative, open surgical, endovascular or a combination of any of these measures.⁴⁻⁸ Treatment is primarily directed at controlling

Figure 2 MRI scan of the pelvis demonstrating pelvic mass (white arrow) suggestive of a large haematoma.

Figure 3 (A) Venogram of the pelvic veins with the patient in prone position demonstrating obstruction of the left common iliac vein (white arrow), (B) balloon dilatation of the same being done with significant waist at site of obstruction (solid white arrow); implanted IVC filter can be seen in the background (hollow white arrow).

the bleeding by using resuscitative measures and using other measures if required. Identification and treatment of the source of bleeding is the most important step in the management of unstable patients. Endovascular techniques for control of bleeding involve usage of covered stents or embolisation of the bleeding varix while surgical techniques involve ligation of the bleeding varix.^{16–8}

In our patient, the bleeding was more contained and the patient did not have haemodynamic compromise, hence it was decided to go ahead with conservative measures initially. The challenge in the present case was offered by the coexistence of life-threatening thrombosis and bleeding. Since bleeding was contained in this index case, anticoagulants were started under close observation to treat life-threatening bilateral PE and DVT. In view of progressive increase in the swelling of the left lower limb due to high thrombus burden, it was decided to go ahead with catheter-directed thrombolysis after the patient tolerated the initial course of anticoagulation. Catheter-based therapies for acute proximal DVT in

the form of catheter-directed thrombolysis, clot extraction, balloon angioplasty and stent placement in selected cases have been found to be successful and prevent long-term sequelae of DVT.⁹ Retrievable IVC filter was implanted in the present case in order to prevent further embolisation of the pulmonary bed. The underlying MTS was treated with balloon angioplasty followed by stenting of the left common iliac vein. Stenting of the iliac vein compared with isolated balloon angioplasty has been found to be safe and has shown good long-term outcome with considerable reduction in the rate of recurrence of thrombosis of the iliac veins.^{14–9} Concomitant anticoagulation is also required to prevent recurrence and the same was done in our patient.

The current study describes successful management of a case of SRH complicated by the presence of PTE and DVT. The patient was managed successfully by a combination of endovascular and conservative measures.

Learning points

- ▶ Spontaneous retroperitoneal haematoma (SRH) is a rare clinical entity seen commonly after rupture of renal tumour, iatrogenic injury to pelvic vasculature or administration of anticoagulants. Rarely does it occur secondary to spontaneous rupture of iliac vein often with concomitant proximal deep venous thrombosis.
- ▶ SRH commonly presents with sudden onset lower abdominal pain, swelling of the left lower limb, anaemia and shock.
- ▶ SRH in association with May-Thurner syndrome (MTS) presents a therapeutic challenge as a life-threatening thrombotic condition coexists with a significant bleeding and a high index of clinical suspicion is required for timely diagnosis.
- ▶ Treatment of SRH with MTS is primarily dictated by the haemodynamic status of the patient and includes application of conservative, surgical and endovascular techniques.

Figure 4 CT scan of the pelvis after endovascular treatment demonstrating disappearance of the pelvic haematoma with stent (white arrow) in the left common iliac vein.

Contributors BS: substantial contributions towards gathering of clinical details and work-up of patient. NB: substantial contributions towards management of patient and review of literature. PB: substantial contributions towards preparation of draft and review of literature. DC: accountable for all aspects of the work related to the accuracy of the work. Final approval of the draft sent for publication.

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