CASE REPORT

Emergency department ultrasound diagnosis of spontaneous iliopsoas haemorrhage in a patient on warfarin

Devesh Sharma,¹ Ramy Saker,² Abha Govind³

¹Department of A&E Medicine, Frimley Park Hospital, Camberley, UK

²Department of Emergency Medicine, Frimley Park Hospital, London, UK

³Department of Obstetrics and Gynaecology, North Middlesex University Hospital, London, UK

Correspondence to

Devesh Sharma,
devsharm@aol.com

SUMMARY

A 87-year-old man presented to the emergency department (ED) with right-sided abdominal and thigh pain which had been present for the last 3 days and was getting worse. He had been diagnosed with a deep venous thrombosis of the left common femoral and superficial veins 10 days previously and had been discharged on a loading dose of warfarin and low-molecular weight heparin (dalteparin) injections. Despite his international normalised ratio being only 2.4, an ED ultrasound showed an unusual mass in the right iliac fossa, partly cystic and partly solid. A CT scan was performed which showed the lesion was a haematoma in the right iliopsoas muscle mass.

BACKGROUND

Warfarin is a life-saving drug which is extensively used.¹ There is an increasing warfarin use, and so the frequency of complications associated with warfarin, especially in elderly patients, is likely to rise.² The major risk associated with the use of oral anticoagulants is haemorrhage, which might be severe or even life-threatening.³ This case illustrates that retroperitoneal haemorrhage can occur even in patients with therapeutic international normalised ratio (INR) levels. Early diagnosis was facilitated in this case by the use of emergency department (ED) ultrasound in a condition in which delayed diagnosis can be fatal.⁴

CASE PRESENTATION

An 87-year-old man was admitted with thrombus in the left common femoral and superficial femoral veins. He had a past medical history of rheumatoid arthritis, atrial fibrillation and two of deep venous thromboses (DVTs). The first DVT had occurred in 1997 following a flight to the USA, it was a proximal right leg DVT and was treated there by thrombolysis with urokinase and followed by 3 months treatment with warfarin. The second DVT, in 2005, was apparently spontaneous and affected the left leg; he was again treated with warfarin for 3 months. He was noted to be in asymptomatic slow atrial fibrillation at the time of admission. Management of DVT has changed radically in the last decade, it is now recognised that DVT is not an acute illness, and a population-based approach has been recommended with consideration given to lifelong anticoagulation in those with idiopathic DVT.⁵ It is likely that this patient would have been given lifelong anticoagulation when he

presented with his first unprovoked DVT if the present day guidelines had also been used in 2005. In any event, the decision was made, when he presented with his third DVT, that he should be on a lifelong anticoagulation. He was discharged home on a warfarin starter pack and low-molecular-weight heparin (LMWH) injections (dalteparin 12 500 IU subcutaneous once daily), the dose being based on his weight of 66.9 kg. He was followed up in the hospital anticoagulation clinic. Patients are generally discharged from hospital with a 7-day course of dalteparin. The INR is checked 3 days after discharge and a few days after this. Two therapeutic INR levels are needed before the dalteparin is stopped. He was waiting for his second therapeutic INR level before stopping his dalteparin injections.

He presented 8 days following discharge with a 3-day history of pain in the right iliac fossa, groin and the front of the thigh. It had been getting worse despite analgesia, and he presented to the ED at 04:00 during the night. There was no history of trauma. He was haemodynamically stable and non-feverish. He was still taking dalteparin and had had his last injection before 12 h. He was found to be tender in the right iliac fossa and in the right groin. There was no swelling of the right thigh or calf. He was unable to perform straight leg raise on the right side but passive movement was possible of the hip. Pulses were normal in both legs. He was given opiate analgesia until the senior's review in the morning.

INVESTIGATIONS

Haematology and biochemical investigations were unremarkable with a haemoglobin of 12.8 g/dL and normal urea and electrolytes and liver function tests, other than slight elevation of the C reactive protein at 24 (normal <10). His creatinine was 97 µmol/L, making accumulation of dalteparin unlikely. The INR was 2.4, within the therapeutic range and not grossly elevated. The X-ray of the hip and pelvis was unremarkable. He was not on any platelet function inhibiting drugs such as aspirin or selective serotonin reuptake inhibitors.

After senior's review, ED ultrasound was performed and this showed an unusual partly solid, partly cystic mass in the right groin measuring 7 cm×5.4 cm (figures 1–3). CT scan was performed to clarify this and it was shown to be a large intramuscular haematoma in the right iliopsoas muscle of size 8 cm×5 cm (figure 4). It contained

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Figure 1 Ultrasound of mixed echogenicity mass, partly solid and partly cystic in the right iliac fossa retroperitoneum.

predominantly intermediate density material with a low-density centre. There was also a high-density blush within, consistent with an acute haemorrhage. It was felt to be arising from a branch of the right internal iliac artery.

DIFFERENTIAL DIAGNOSIS

When initially seen, he was felt to be suffering from musculo-skeletal hip pain, and X-rays were taken to illustrate any bony pathology.

TREATMENT

Following the diagnosis, his anticoagulation was rapidly reversed with beriplex (a pooled virally inactivated prothrombin complex concentrate) and treatment with warfarin was terminated. He was given vitamin K 10 mg intravenously because of the short half-life of factor VII in beriplex. He became hypotensive (blood pressure 75/40) following the CT scan, this responded to intravenous gelofusine and was followed by transfusion of three units of packed red blood cells. He was closely monitored on the surgical ward and was discharged after 11 days on lifelong dalteparin injections (12 500 IU subcutaneous daily) as he was now felt to be unsuitable for warfarin treatment.

Figure 2 Ultrasound of mass, callipers measure 6.95 cm.

OUTCOME AND FOLLOW-UP

There has been no further complication and the patient remains on dalteparin injections.

DISCUSSION

Retroperitoneal haemorrhage is most frequently seen after femoral artery catheterisation or pelvic and lumbar trauma. In the absence of trauma, retroperitoneal haemorrhage most frequently results from a ruptured abdominal aortic aneurysm or bleeding from an underlying condition in the kidneys or adrenal glands. Spontaneous retroperitoneal haemorrhage (SRH) denotes bleeding without any known inciting trauma or underlying retroperitoneal pathology. SRH is uncommon and is almost exclusively seen in association with anticoagulation states, coagulopathies and haemodialysis.⁴ This case illustrates that it can be associated with therapeutic doses of warfarin.

It is unlikely that the haemorrhage was due to the dalteparin treatment as he had good renal function and has been on an identical dose of dalteparin since with no complication and therapeutic levels of antifactor Xa.

Attempts have been made to predict those likely to suffer complications on warfarin. Age over 65 years old has been shown to be a risk factor and it can be seen that, as we are treating more elderly patients with warfarin now, we are likely to see an increasing number of complications. Other factors, such as a history of gastrointestinal bleeding, recent myocardial infarction, severe anaemia, diabetes mellitus or renal impairment are also important.⁶

Warfarin is a life-saving drug which is extensively used in the treatment and prophylaxis of a variety of diseases including DVT, pulmonary embolism, valvular heart disease, atrial fibrillation, recurrent systemic emboli, recurrent myocardial infarction, prosthetic heart valves and prosthetic implants.¹ There is an increasing warfarin use for the prevention and treatment of thromboembolic disease and so the frequency of complications associated with warfarin is likely to rise.^{1 2} The major risk

Figure 3 Ultrasound of mass extending into psoas in groin.

Figure 4 CT examination showing large haematoma in the right iliopsoas.

associated with the use of oral anticoagulants is haemorrhage, which might be severe or even life-threatening and the annual risk of bleeding is approximately 15% with two or three major bleeds per 100 patient-years. Although major bleeding can occur at therapeutic levels, the risk of bleeding rises with increasing intensity of anticoagulation.^{3–7} The INR is recommended for laboratory monitoring of oral anticoagulant therapy and as a guide to warfarin dose adjustment (British Committee for Standards in Haematology, 1998).

It has been shown that as the INR increases there is an increase in the risk of major bleeding. With $\text{INR} \geq 5.0$ there is an increase in the risk of bleeding of 3.6-fold compared⁸ with $\text{INR} \leq 2$. Those with $\text{INR} \geq 6$ face a significant risk of major haemorrhage.⁹

It should be remembered, however, that haemorrhage can occur even with therapeutic INR levels and this can be massive and life-threatening.⁴ If the diagnosis is made early, treatment can be conservative, by discontinuing warfarin treatment and reversing anticoagulation, together with volume resuscitation, haemodynamic stabilisation, transfusion therapy and supportive measures as in this case. Angiography and embolisation may also be useful. Surgical intervention and evacuation of the haematoma can then be limited to those with uncontrollable haemodynamic collapse or when there are major neuropathic symptoms felt to be due to reversible direct pressure and pressure-induced effects.⁴

There are likely to be changes in treatment of DVT with the introduction of new anticoagulants such as rivaroxaban and dabigatran. Dabigatran has been submitted for European Regulatory approval as treatment for acute DVT,¹⁰ but this has not been approved yet. Rivaroxaban is further along the process of being accepted as treatment for DVT. The National Institute of Health and Care Excellence (NICE) has recommended rivaroxaban as a possible treatment for DVT¹¹ but NICE recognises that the current management of venous thromboembolism is initially with LMWH for rapid anticoagulation, and overlapped with warfarin until an effective dose is achieved as was being carried out in this case. NICE also notes that there are likely to be comparable rates of clinically relevant bleeding when

rivaroxaban is compared with present standard management so, even if the anticoagulation regime for DVT changes it will still be necessary to consider haemorrhagic complications and have a low threshold for investigation. ED ultrasound examination should be utilised when there are appropriate skills available.

Learning points

- ▶ Retroperitoneal haemorrhage can occur with therapeutic doses of warfarin.
- ▶ Emergency department ultrasound can trigger suspicion of this condition and appropriate investigation and management.
- ▶ Early diagnosis can be life-saving and allow conservative treatment to be effective.

Contributors DS and RS attended the patient. DS performed the ultrasound and organised further investigations. All the authors performed the literature search and were involved in the writing of the manuscript.

Competing interests None.

Patient consent Obtained.

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