Royal Australasian College of Surgeons

ANZASM Case of the Month
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(case selected by the ANZASM Committee for your information)

DVT prophylaxis for high-risk patients with lower limb trauma

Orthopaedic Surgery

Case summary

A woman in her mid-30s presented to a local hospital after a fall that fractured her ankle. Her comorbidities included morbid obesity and smoking.

The limb was immobilised in a splint and the patient was advised that surgical treatment was required. She wanted to be treated closer to her home. The treating doctors were arranging an inter-hospital transfer when she discharged herself the next day, against medical advice.

Five days after the fall, with ongoing ankle pain, she presented to a hospital close to her home. She was admitted for surgery once the swelling had resolved.

During the next few days, she reported high pain levels and was seen by the acute pain service. She was treated with patient-controlled analgesia (PCA); enoxaparin sodium 40mg daily was administered. She was observed to have sinus tachycardia and reduced oxygen saturation, which was present on admission and remained throughout. The patient did not report chest pain, shortness of breath or cough. There was no fever, calf swelling or tenderness.

Five days after admission, the patient's condition deteriorated. She had dyspnoea and severe chest pain. A medical emergency team call was made and a pulmonary embolus (PE) diagnosed. Resuscitation was undertaken but this was unsuccessful. At autopsy, factor V Leiden was identified.

Discussion

This patient's surgery was delayed due to swelling of the limb. She commenced on venous thromboembolism (VTE) prophylaxis. She suffered a massive PE, which proved fatal despite resuscitation attempts.

It is easy to diagnosis PE with access to all relevant information; however, this picture seemed far from clear. In retrospect, the decisions remained too heavily influenced by information acquired early on. The treating orthopaedic team focused on reducing the swelling to facilitate surgery. Tachycardia secondary to pain and anxiety (as diagnosed by the after-hours medical officer) continued despite PCA.

PE was not considered as a differential diagnosis because the patient's initial electrocardiogram showed no concerning features, her calf examination did not reveal evidence of deep vein thrombosis (DVT), and VTE prophylaxis had commenced. The patient reported no chest pain or

shortness of breath. Clinicians were able to justify her tachycardia (she was in pain and anxious) and her need for oxygen (she was on PCA).

Although this patient's death may not have been preventable, it was stated in the coronial findings that there was 'an absence of point-of-time critical review of the deceased's clinical management'. There were deficiencies relating to communication processes, a delay to VTE assessment and to recognising clinical deterioration.

Importantly, the Coroner also noted: 'Only at autopsy was it identified that the deceased suffered from a rare heterozygous factor V Leiden mutation, which is a mutation of one of the clotting factors in the blood. It confers an 8-fold risk of venous thromboembolism compared with the general population. The health service could not be expected to consider this rare genetic disorder.'

Clinical lessons

PE is a rare but potentially fatal complication of trauma and immobilisation. Patients with known risk factors for DVT (i.e. smoking and morbid obesity), should be managed as high-risk and should be offered DVT prophylaxis at the time of initial presentation. DVT prophylaxis guidelines should be followed. [1-3] This includes daily in-hospital monitoring for DVT, particularly for high-risk patients with morbid obesity, mobility issues and smoking status. [4]

A prolonged period of reduced oxygen saturation needs to be investigated to establish a cause. A point-of-time critical review was missed, and the patient's hypoxia and tachycardia should have been assessed on admission.

References

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