Recurrent haematomas of the thigh: a case of von Willebrand’s disease presenting to a sports clinic

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Abstract
Von Willebrand's disease is a relatively common mild form of haemophilia. It should be suspected in assessing sports injuries when excessive bleeding occurs in response to relatively mild trauma. Those with the disease should remain active but avoid contact sports. They should not take aspirin or non-steroidal anti-inflammatory drugs, which may exacerbate bleeding, and should be given supportive treatment to cover dental extraction, surgery, or significant bleeding episodes.

Keywords: von Willebrand’s disease; haemophilia; haematoma; sports clinic

Case history
A 19 year old college rugby player and rower presented to the sports injury clinic with a history of recurrent injuries to his left thigh. The initial injury had occurred at the age of 13 when he sustained a knock and subsequent haematoma while playing rugby. Physiotherapy was given and the injury took several weeks to settle. Again, one year before presentation he had sustained a similar recurrent blunt injury to the thigh followed by significant thigh swelling, which had taken four weeks to settle with physiotherapy. An x-ray showed no bony abnormality or myositis ossificans.

At presentation he had knocked the outer aspect of his left thigh on his desk five days earlier, which had left him with some mild muscle tenderness and discomfort but without any swelling. Three days later he had gone for a run, though he was still aware of some discomfort to the thigh. The following day he found the thigh had swelled up considerably with significant thigh swelling. Three days later he had gone for a run, though he was still aware of some discomfort to the thigh. The following day he found the thigh had swelled up considerably with significant thigh swelling.

On examination he had a swollen thigh with a 15 × 20 cm swelling over the vastus lateralis, which was generally tender. There was a small sympathetic effusion in the left knee. He had limitation of knee flexion to 80°.

A further x-ray examination was made which showed some cortical thickening of the posterior-lateral aspect of the mid shaft of the femur consistent with old calcification of a subperiosteal haematoma. It was not thought likely that he had a stress fracture given the history of only mild trauma, and there was no evidence of myositis ossificans. A soft tissue ultrasound examination showed an 8 × 3 × 3 cm haematoma and confirmed a bump in the contour of the femur in transverse section.

On further inquiry it was evident that the patient had tended to bruise easily in the past and had bled excessively on one occasion after a dental extraction, but had never undergone any other surgery or sought medical advice before this about a possible bleeding tendency. In view of this history of a possible bleeding diathesis a full blood count and clotting studies were undertaken which showed haemoglobin 144 g/l, white cell count 13.3 × 10³/l, platelets 360 × 10³/l, partial thromboplastin time 13.6 seconds (normal 12–16), activated partial thromboplastin time (APTT) 53.3 seconds (normal 28–46). Repeat clotting studies confirmed a prolonged APTT of 48.0 seconds. He was therefore referred to the haematology department, where a prolonged bleeding time of >11 minutes was confirmed (normal <9 minutes). Further clotting studies showed a von Willebrand’s antigen of 27% (normal >55%) and ristocetin cofactor (RICOF) of 30% (normal >55%), confirming a diagnosis of mild von Willebrand’s disease.

He was advised by the haematology department that in future he should avoid non-steroidal anti-inflammatory drugs and aspirin, and that he would require treatment with desmopressin acetate (DDAVP) and tranexam acid to cover dental extraction or any other surgery. Supportive treatment might also be given to cover any further significant bleeding episode. It was not thought that he would run into any problems in his day to day life. However, it was recommended that he should no longer participate in contact sport and he is now concentrating on his light-weight rowing.

Discussion
Von Willebrand’s disease is the most commonly inherited bleeding disorder and is the result of a deficiency or abnormality of an adhesive glycoprotein called von Willebrand’s factor (VWF).

This factor is synthesised by megakaryocytes and is stored in platelet alpha granules. It is also produced by and stored in endothelial cells and present as large glycoprotein multimers in the circulation.

Deficiency of VWF causes a reduction in platelet adherence to damaged subendothelium and also in platelet-platelet aggregation, with a consequent increase in bleeding time (fig 1). In addition, the level of factor VIII, which is carried and stabilised by VWF, is often reduced.

The gene for VWF is on chromosome 12 and the disease is generally inherited as an
This case presented with recurrent haematomas after relatively mild trauma. The possibility of a bleeding diathesis should always be considered in such cases, and clues to this should be sought in the history. Von Willebrand's disease may present, as in this case, with relatively mild symptoms, but other conditions such as acute compartment syndrome after venepuncture and epidural haematoma after minor trauma have been associated with the disease.\(^6\) It may also present relatively late in adolescence or early adulthood compared with the major clotting disorders that tend to present in early childhood. The benefits of picking up a coagulation defect are obviously important in preventing serious haemorrhage due to trauma and complications related to surgery in the future.

A review of sports and haemophilia in 1996 concluded that those with major haemophilia tended to be overprotected and were generally not allowed to participate in sporting activities normal to their peer group.\(^7\) It was recommended that subjects with haemophilia A and B should generally be encouraged to be active as there was some evidence that exercise might reduce or prevent intra-articular haemorrhage by maintaining muscle strength and tone. Contact sports were generally discouraged, but other sports such as swimming, golf, and table tennis were encouraged. The advice in von Willebrand's disease is less clear cut as there is considerable phenotypic variability in the severity of the disease. It would be prudent to obtain individual advice from the local haematology department, and avoid contact sports if there is any significant bleeding diathesis.


**Take home message**

Mild coagulation defects are relatively common and may present in late childhood or early adult life as a result of sporting injury. A bleeding diathesis should be suspected when disproportionate bruising and swelling occur in response to relatively minor trauma.
Commentary

Bleeding problems presenting as a result of sporting injury are rare. They are either congenital or acquired and most congenital problems present in early childhood when toddlers begin to walk and fall over. There are, however, some disorders that are milder and which may only cause haematoma as a result of more severe injury; von Willebrand’s disease is the commonest of these. There are also a number of hereditary platelet problems that may present with easy bruising and may require specialist referral for diagnosis. Most cases of easy bruising are not associated with any haematological abnormality. A bleeding time is a useful means of assessing such patients, but a detailed history, including family history, and clinical examination, are prerequisite and are best undertaken by a specialist. Aspirin and other non-steroidal anti-inflammatory drugs can lead to easy bruising in normal people. Thrombocytopenia is a fairly common condition, usually transient, which can cause easy bruising and infectious mononucleosis, and can occasionally result in severe thrombocytopenia, and splenic rupture as a result of playing rugby while convalescing from infectious mononucleosis has occurred.

Other coagulation problems fortunately are rare and usually associated with such severe illnesses that the patient would be too unwell to participate in sport.

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Exercise on both sides of the curriculum

Dundee Medical School changed its curriculum five years ago to accommodate the General Medical Council publication *Tomorrow’s Doctors*. We are in the early stages of creating a wellbeing programme for our medical students, which has only reached the pilot stage. This programme is based around an awareness raising instrument developed by the university counselling service which encourages medical students to examine their own wellbeing in the domains of mind, body, and spirit. These domains include the amount of exercise students take, how well they sleep, what type of relationships they have, how balanced their diet is, and how much they use stimulants such as caffeine. Students plot their own results and receive aggregated data from their class. Early aggregated results tend to show students scoring high in the areas of mind and spirit, eating a reasonably balanced diet, but exercising less than is ideal. Our instrument is still in the developmental stage and requires considerable work in terms of developing its validity and reliability parameters.

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