

aspirate was cellular with all lines represented, but the megakaryocytes showed maturation arrest. A drug-related thrombocytopenia was suspected her medications were nifedipine and gliquidone, which were stopped. The patient had started taking nifedipine 20 days before and had been on treatment with gliquidone for 5 years.

Prothrombin time, partial thromboplastin time and thrombin clotting time were normal, but the fibrinogen level was elevated to 700 mg/dl and the concentration of fibrin degradation products was less than 10 µg/ml. Liver function tests were normal.

We executed the Dixon test^{1,2} to investigate the presence of antibody anti-nifedipine and gliquidone, the first test only being positive. Ten days after hospitalization, platelets were normal. We suspect that nifedipine may be the cause of thrombocytopenia in this case, even though this is rarely described in medical literature.^{3,4} The pathogenesis of thrombocytopenia from nifedipine is unknown.

On the basis of the foregoing, we suggest that thrombocytopenia may occur as a result of exposure to nifedipine.

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Massive intra-abdominal bleeding complicating bone marrow aspiration and biopsy in multiple myeloma

Sir,

Bone marrow aspiration and biopsy have traditionally been considered safe procedures even when severe coagulopathies or thrombocytopenia are present.¹ We recently encountered a patient with multiple myeloma who had fatal intra-abdominal haemorrhage following iliac crest bone marrow aspiration and biopsy. This experience suggests that the risk of complications from bone marrow aspiration or biopsy in diseases causing severe bone destruction should be re-evaluated.

An 81 year old woman with IgA myeloma refractory to chemotherapy was admitted with epistaxis, gum bleeding, lethargy and abdominal pain. Haemoglobin was 6.7 g/dl, white cell count $4.97 \times 10^9/l$, platelet count $49 \times 10^9/l$, serum creatinine 160 µmol/l, and coagulation screen normal.

To determine the aetiology of the pancytopenia, iliac

crest aspiration and biopsy were unsuccessfully attempted bilaterally. A right posterior iliac crest bone marrow biopsy was then obtained with a Jamshidi-Swain needle. A hypercellular marrow full of plasma cells and lymphocytes was found with few normal cells. No amyloid was found.

Several hours after the procedure, the patient became hypotensive. During the next few hours, ecchymoses appeared in the right lower quadrant. A computed tomographic scan revealed a large haemoperitoneum with widespread lytic lesions particularly in iliac bones. Angiography revealed bleeding overlying both sacro-iliac joints. There was no obvious bleeding from the viscera. Selective embolization of the right ileo-lumbar and internal iliac arteries achieved only partial haemostasis. She died on the ninth hospital day.

This outcome of bone marrow biopsy and aspiration has not been described before in multiple myeloma. In this case, the temporal association implicates bone marrow aspiration or biopsy of bone damaged by widespread lytic disease as the likely cause of fatal haemorrhage. It is of note that bleeding was found also on the left iliac crest, which only underwent an aspiration attempt using a 16 gauge sternal aspiration-type short needle.

The haemorrhagic diathesis of myeloma, a potential result of coagulation factor inhibition, hyperviscosity, vascular abnormalities or impaired platelet function, could have contributed to bleeding in this patient although thrombocytopenia was not severe. In view of normal tests of coagulation, it appears unlikely that significant coagulopathy secondary to fibrin polymerization defects or to acquired inhibitors existed.² Despite the biopsy findings, amyloid infiltration of blood vessels preventing vasoconstriction is not excluded.

Retroperitoneal haemorrhage following bone marrow biopsy has been reported in two previous patients, both of whom survived.^{3,4} In these cases, osteoporosis and renal osteodystrophy were the predisposing factors. Although the complication rate from repeated marrow aspirations of healthy iliac crests as in bone marrow donors is small,⁵ the risk with diseased bone may be greater. Our case suggests that when severe bone disease is present, the indication and value of bone marrow aspiration or biopsy should be carefully considered.

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