

RETROPERITONEAL HEMORRHAGE FOLLOWING BONE MARROW BIOPSY

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ABSTRACT

We report the case of an elderly woman with polycythemia vera submitted to bone marrow biopsy who developed retroperitoneal hemorrhage as a result of direct penetration of the needle through the iliac crest, with damage to the iliolumbar artery, the first branch of the hypogastric artery.

Key words: bone marrow biopsy, retroperitoneal hemorrhage

Bone marrow biopsy is currently a well-established procedure used extensively to investigate hematological and oncological diseases; it may help provide a clinical diagnosis, can be useful in certain diseases for assessing the extent of involvement or the response to treatment and, finally, it is used to harvest marrow for bone marrow transplant.¹⁻⁷ It is usually performed at the posterior superior iliac spine, or rarely at the anterior superior iliac spine or at other sites when an x-ray film or bone scan locates a specific lesion. With the advent of the Jamshidi needle,⁸ this procedure has caused few complications. Of course it is possible to perforate the iliac bone and provoke retroperitoneal hemorrhage in patients with osteoporosis (particularly in older women),¹ but to the best of our knowledge this has not been reported to date. We believe it is useful to report a case of retroperitoneal hemorrhage as a complication of iliac crest biopsy. The lesion was demonstrated by computed tomography (CT) scan and digital angiography, and was treated surgically.

Case report

A 74-year-old woman presented with a diagnosis of polycythemia vera. Two years earlier

she had suffered a myocardial infarction, and more recently two transient cerebrovascular accidents for which she was admitted to another institution where she underwent repeated phlebotomies and was given an antiplatelet agent (Ticlopidine 250 mg/day), because laboratory analyses showed elevated values of hemoglobin and hematocrit (18.9 g/dL and 62%, respectively) with moderate thrombocytosis ($716 \times 10^9/L$). Clinical examination revealed no abnormal physical findings: in particular no hepato-splenomegaly was present.

Significant laboratory values included the following: hemoglobin 14.5 g/dL, red blood cells $6.42 \times 10^{12}/L$, white blood cells $7.8 \times 10^9/L$, platelets $585 \times 10^9/L$, leukocyte alkaline phosphatase activity 217, serum B12 451 pg/mL, arterial O₂ saturation 94%, prothrombin time 11 sec (ratio 1.16), partial thromboplastin time 32 sec (ratio 1.12). In order to establish a final and correct diagnosis a bone marrow biopsy was attempted with a Jamshidi needle (Bone-Temno model BT 4.5×15) from the left posterior superior iliac spine.

The biopsy procedure was uneventful. The bony tissue was of normal consistency; the specimen was 4 cm long and adequate for histological examination.

Immediately after the procedure the patient



Figure 1. Postcontrast CT scan at the level of the pelvis shows a large acute hematoma occupying the left retroperitoneal spaces and displaces the enhanced pelvic vessels anteromedially.

complained of pain at the biopsy site followed by a vasovagal crisis, which quickly improved in the Trendelenburg position. Since the pain was acute, the patient was treated with Diclofenac (75 mg/i.m.) and an ice-bag on the biopsy area. She continued to lie down. Two hours later the pain had disappeared but the patient still experienced discomfort in the left groin. Clinical examination revealed swelling tender to palpation above the lower left abdominal quadrant. Blood pressure was 130/80 mm/Hg (unchanged from basal value), but in the orthostatic position she developed serious hypotension with short-term loss of consciousness.

An ultrasound was done at once and revealed fluid in the pelvic cavity; CT showed a massive retroperitoneal hemorrhage extending from the pelvic extraperitoneal spaces to the posterior pararenal space, displacing the iliac vessels anteriorly (Figure 1). No morphologic or structural anomaly of the bones was observed. Digital arteriography located the bleeding site on the iliolumbar artery, the first collateral branch of the hypogastric artery (Figure 2). Vascular surgeons performed a laparotomy and stopped the bleeding at both the upper and lower ends. About 2.5 liters of blood had collected in the abdominal cavity.

Discussion

Bone marrow biopsy, usually simple and safe, can cause a few complications, mostly limited to pain at the biopsy site and occasionally local bleeding, above all in patients with coagulation

disorders,¹ myeloproliferative disorders or Paget's disease.⁹

Infections at the biopsy site,¹ needle tract seeding,¹⁰ transient pressure neuropathies,^{11, 12} pneumoretroperitoneum,¹³ fracture of the iliac crest,^{4, 14} and fracture of the ilium (the latter after several bone marrow biopsies for autologous bone marrow transplantation),¹⁵ aspiration needle break,⁴ and fluid leak at the biopsy site¹⁶ (Table 1) are extremely rare.

We report a case of bone marrow biopsy complicated by retroperitoneal hemorrhage likely caused by direct penetration of the needle through the iliac crest, with consequent traumatic lesion of the iliolumbar artery. The antiplatelet agent was not directly responsible for the hemorrhage and probably did not contribute much toward the persistent bleeding. In fact, no hemorrhaging occurred at the biopsy site.

This serious incident confirms that bone marrow biopsy, while usually safe, can occasionally present important complications not always immediately evident or quickly diagnosed, even if carried out by an experienced staff. Therefore, we think that some indications must always be followed.

Optimal specimens should be long enough for adequate processing, but not more than 3 cm.



Figure 2. Intra-arterial digital angiography shows a tear in the iliolumbar artery with extravasation of contrast medium (black arrow).

Table 1. Complications of bone marrow biopsy.

common

- pain
- local bleeding

rare

- infections
- needle tract seeding
- pressure neuropathy
- retroperitoneum
- iliac crest and iliac bone fracture
- needle break
- fluid leak
- retroperitoneal hemorrhage

When non hospitalized patients undergo bone marrow biopsy, they must be observed carefully for longer periods of time to watch for persistent pain at the iliac crest. Such discomfort can easily be relieved by analgesic drugs, but it could suggest a serious problem that only a few hours later may show more indicative symptoms. In this case, pain in the inguinal region and severe orthostatic hypotension.

In any event, before performing bone biopsy, we think it correct to stop all antiplatelet or anticoagulant agents, even though biopsies have been performed in patients with severe thrombocytopenia without causing serious bleeding.

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