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RESEARCHARTICLE

BROKEN NEEDLE DURING BONE MARROW ASPIRATION: A RARE COMPLICATION

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ABSTRACT

The conventional Bone marrow aspiration and trephine biopsy is a routinely done investigation under conscious sedation with rare complications. We present an atypical case of a 47 year old male who was diagnosed with a broken biopsy needle in an urban academic hospital. A removal in theatre under fluoroscopy was performed by the orthopaedic surgery team. At postoperative follow up, the patient was symptom free.

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INTRODUCTION

Bone marrow aspiration and trephine biopsy is performed for cytological analysis of the bone marrow. Complications associated with this procedure are rarely published and have an incidence of 0.1-0.3%. Haemorrhage is the commonest adverse event and biopsy needle breakage is unusual (1,2,3). Bone marrow examination is performed frequently to investigate haematological tumours, other haematological disorders and tumour staging (3). The posterior superior iliac crest is the commonly used site for aspiration and standard biopsy needles are suitable for aspiration (4). This procedure can be performed on an outpatient basis with local anaesthesia or under conscious sedation (5). We present a rare case of a broken biopsy needle during bone marrow aspiration and trephine biopsy (BMAT) procedure.

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Case presentation

A 47 year old male presented to the orthopaedic surgery department with a history of persistent pain after undergoing a BMAT procedure. He was admitted five days prior to presentation by the medicine department. He is known with human immunodeficiency virus (HIV), World Health Organization (WHO) stage 3 symptoms. He defaulted antiretroviral treatment, and currently with a working diagnosis of Pancytopenia.

A junior member of staff was performing the BMAT procedure under supervision. This was done in a prone position under local anaesthesia and an aseptic technique followed. A disposable size 11G x 15cm bone-medullary needle was utilized. During the procedure, the needle broke as a result of the patient moving due to pain. After failed attempts to retrieve the needle under local anesthetic, orthopaedic surgery registrar on call was consulted to intervene.

Physical examination

On physical examination he had a 2-3cm transverse wound on the right posterior superior iliac spine, sutured with Nylon (Figure 1) and remained neurovascular intact.

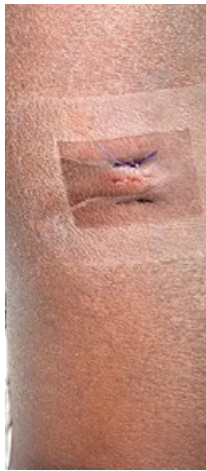


Figure 1. Shows a sutured wound on the posterior superior iliac spine region

Investigations and results

Plain radiograph of the pelvis showed a metallic needle in the sacroiliac joint (Figure 2).

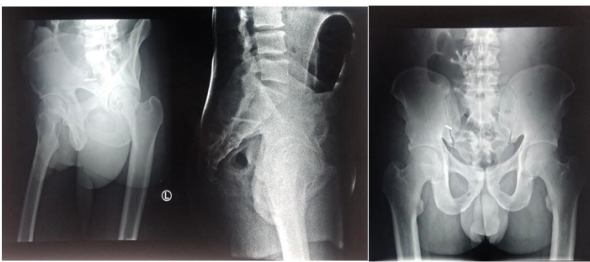


Figure 2. Shows radiographs of the Pelvis with a metal in the sacroiliac joint

Treatment plan outcome

A removal in theatre under Fluoroscopy was planned. The patient was under general anaesthesia in a prone position and it was done under aseptic condition. The needle was identified under fluoroscopy using triangulation method (Figure 3).

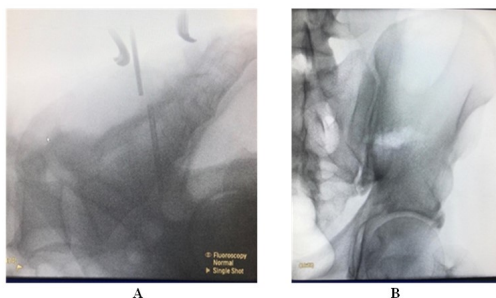


Figure 3. Shows an intraoperative fluoroscopy image. A: preoperative and B: Posterior anterior view after metal removed.

The Nylon suture was removed, soft tissue dissected down to the needle (Figure 4) and the needle was completely flushed against bone.



Figure 4. Intraoperative image of the metal flushed on the bone

A drill bit and pliers were used to retrieve it successfully (Figure 5). Bone marrow aspiration was done under the same setting and wound was closed primarily. Postoperatively the patient was stable and not bleeding from the surgical site.



Figure 5. Diagram of the biopsy needle measuring 4.5cm long

Actual outcome: At 2 weeks review, the sutures were removed and clinically the wound had healed with no issues. He had no neurological fallout and he was discharged from the orthopaedic surgery department.

DISCUSSION

This case report describes a rare complication of a broken needle during bone marrow aspiration. BMAT is a safe procedure but not totally a risk-free one. Below we describe the bone marrow aspiration and biopsy done on the posterior iliac crest.

Surgical approach

Preoperative: An informed consent should be obtained from the patient or guardian. An assessment of the BMAT site you are planning to use should be undertaken. The patient should lie in a prone or lateral decubitus position.

The procedure should be done under an aseptic technique with the patient draped. Local anaesthesia should be infiltrated into the skin, soft tissue and periosteum. If a patient is anxious the BMAT procedure should be done under general anaesthesia.

Intra-operative: Make a small skin incision for the biopsy needle. BMAT needle is inserted into the iliac crest then the needle trocar or stylet is removed. A 2cm long specimen should be ideal and the aspirate specimen is placed on sterile slides. Haemostasis is achieved by direct pressure, skin suture, and pressure bandage for at least a day.

Post-operative: In 7-10 days the surgical site is assessed and suture removed (1,3,6).

Complications associated with this procedure are rarely published with an incidence of 0.1-0.3% (1,2,3). Some of the complications reported previously include the following; haemorrhage, needle breakage, persistent pain, infection and fracture at the site of the biopsy in osteopenic bone.(2,5,7). Bain et al, reported 0.01% (7 of 54 890 cases) of needle breakage in a seven (1995-2001) year study with haemorrhage being the commonest adverse event (8). Sheoran et al, reported a single case of a 45 year old female with a broken needle biopsy during a BMAT procedure and it was removed under spinal anaesthesia using pliers (3). Kumar et al, reported a case of broken bone marrow biopsy needle that occurred in a 31 year old male during BMAT procedure (5). Asprey et al. described an easily applied technique of removing a biopsy needle fragment using a cannulated drill (9). All health care workers performing BMAT procedure should be trained and supervised until they are competent to perform the procedure (4).

Conclusion

Bone marrow aspirate and trephine biopsy procedure is a safe procedure that should be performed by a trained health care worker, yet it is not without complications. Needle breakage has been rarely reported and it needs to be avoided during the procedure by giving adequate anaesthesia to prevent pain. An informed consent must be obtained with a clear discussion of the procedure and its complications.

Competing interests:

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this case report.

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