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Balloon tract dilatation facilitates fluoroscopically guided removal of deeply penetrating foreign bodies

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ABSTRACT

Previous reports describe removal of foreign bodies using image guidance with serial tract dilation or blunt and sharp dissection techniques. This report describes a novel technique utilizing balloon tract dilatation to facilitate the removal of retained radiopaque soft tissue foreign bodies under fluoroscopic guidance. This technique offers a minimally invasive approach for rapid retrieval of deeply penetrating foreign bodies, obviating the need for a large incision or surgical cut down.

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Introduction

Previous reports describe removal of foreign bodies using image guidance with serial tract dilation or blunt and sharp dissection techniques [1,2]. This report describes a novel technique utilizing balloon tract dilatation to facilitate the removal of retained radiopaque soft tissue foreign bodies under fluoroscopic guidance. This technique offers a minimally invasive approach for rapid retrieval of deeply penetrating foreign bodies, obviating the need for a large incision or surgical cut down.

Case report

A 51-year-old woman developed persistent pain in her right hip after sustaining a fall. She was found to have a nondisplaced

acetabular fracture, with incidental note made of a metallic spheroid BB projectile lodged within the deep right gluteal soft tissues on computed tomography imaging (Fig. 1A). Magnetic resonance imaging (MRI) of the hip was recommended because of concern for pathologic fracture; however, during the MRI scan, the patient developed a painful burning sensation at the site of the retained BB, likely due to the presence of ferromagnetic material within the foreign body, and the scan was aborted. Interventional radiology was consulted for foreign body retrieval. Upon further questioning, the patient recounted that the metallic BB had been present since an incident during childhood.

The patient was subsequently brought to the angiography suite. After induction of general anesthesia, the patient was placed prone on the table. The metallic BB was identified fluoroscopically within the right gluteal soft tissues. A small skin incision was made overlying the BB and an 18-gauge Chiba needle was advanced from the skin surface to the level of the metallic BB under fluoroscopic guidance (Fig. 1B). The back end

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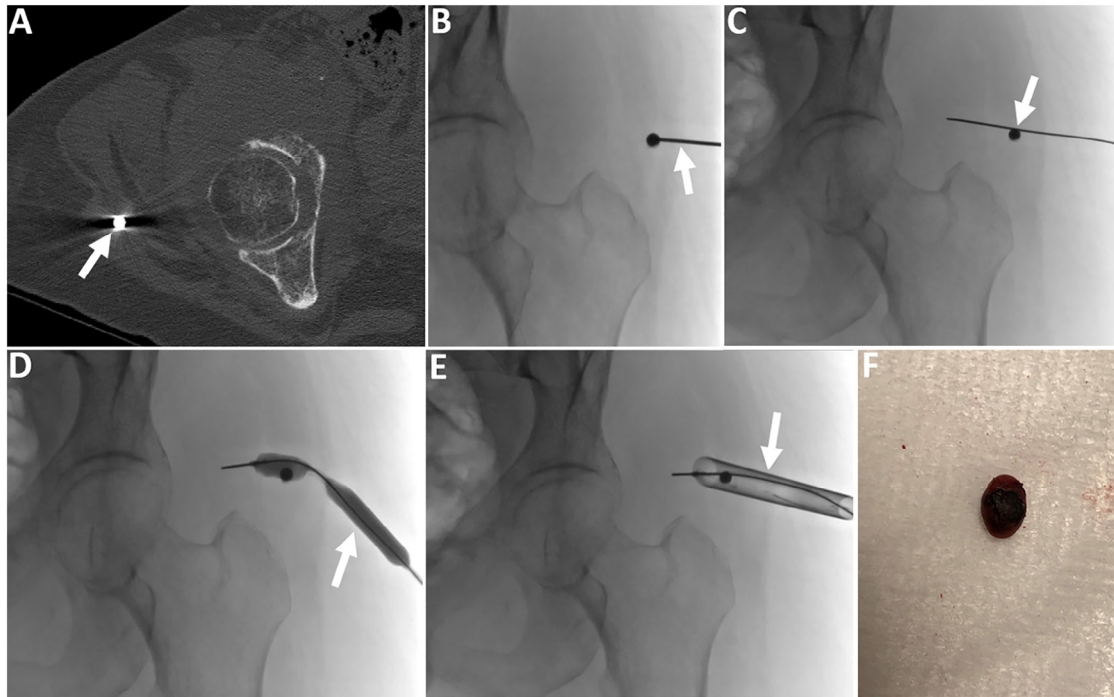


Fig. 1 - (A) Axial computed tomography image demonstrating a radiopaque foreign body compatible with a BB within the deep right gluteal soft tissues (white arrow). **(B)** Under fluoroscopic guidance, an 18-gauge Chiba needle was advanced to the level of the bullet (white arrow). **(C)** The back end of an Amplatz Super Stiff wire (white arrow) was placed through the needle into the soft tissues. **(D)** An 8-mm \times 15-cm Bard X-Force high pressure balloon preloaded with a 24-French Teflon sheath was advanced over the wire into the tract and inflated to dilate the tract (white arrow). **(E)** The 24-French Teflon sheath was then advanced over the inflated balloon into the tract (white arrow). **(F)** The 4 mm metallic BB following removal with evidence of corrosion.

of an Amplatz Super Stiff Guidewire was advanced through the needle into the gluteal soft tissues and the needle removed (Fig. 1C). An 8-mm \times 15-cm Bard X-Force high-pressure balloon was then advanced over the guidewire to the level of the retained foreign body and the soft tissue tract was dilated (Fig. 1D) by over-sheathing the balloon with the 24-French Bard X-Force Teflon sheath (Fig. 1E). The skin incision was extended to 2 cm, and, using a combination of hemostats and manual extraction, the metallic BB was expelled to the skin surface and removed (Fig. 1F). Fluoroscopy confirmed complete removal of the BB, and the skin tract was sutured in layers.

Post procedure the patient reported mild discomfort at the site of foreign body retrieval; however, this was masked by ongoing right hip pain. She subsequently underwent MRI of the right hip without difficulty, confirming a pathologic right acetabular fracture.

Discussion

Previous studies have reported the removal of foreign bodies, including gun pellets ($n = 223$), metal splinters ($n = 24$), and

needle fragments ($n = 4$) using an 18-gauge needle, tapered dilators, and grasping forceps under fluoroscopic guidance [1]. Additional studies have reported the removal of ballistic foreign bodies ($n = 61$) using ultrasound or fluoroscopy [2]. This report describes a novel technique utilizing balloon tract dilatation to facilitate the removal of a retained radiopaque soft tissue foreign body. This technique offers an alternative, minimally invasive, approach for rapid retrieval of deeply penetrating foreign bodies, obviating the need for a large incision or surgical cut down.

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