Interventional Radiology

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

Rajiv N. Srinivasa MD, Ravi N. Srinivasa MD, Jeffrey Forris Beecham Chick MD, MPH, DABR*

Department of Radiology, Division of Vascular and Interventional Radiology, University of Michigan Health Systems, 1500 East Medical Center Drive, Ann Arbor, MI 48109, USA

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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 sphericoid 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 of the needle was then dilated with a balloon catheter to facilitate extraction of the BB.
of an Amplatz Super Stiff Guidewire was advanced through the needle into the soft tissues and the needle removed (Fig. 1C). An 8-mm x 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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