Canadian Association of Radiologists Journal 63 (2012) S7−S10

CANADIAN ASSOCIATION OF RADIOLOGISTS JOURNAL

www.carjonline.org

Vascular and Interventional Radiology / Radiologie vasculaire et radiologie d'intervention

Cone-Beam Computed Tomography as an Adjunct to Performance of Percutaneous Cementoplasty of the Acetabulum

Peter L. Munk, MD, CM, FRCPC, FSIR[a,*], Manraj K. Heran, MD, FRCPC[a], David M. Liu, MD, FRCPC[a], Hugue A. Ouellette, MD, FRCPC[a], Paul W. Clarkson, MB, ChB, FRCSC[b]

[a]*Department of Radiology, Vancouver General Hospital and the University of British Columbia, Vancouver, British Columbia, Canada*
[b]*Department of Orthopedics, University of British Columbia and the British Columbia Cancer Agency, Vancouver, British Columbia, Canada*

Abstract

Acetabuloplasty is a valuable palliative adjunct for the treatment of patients with painful metastatic disease to the pelvis in selected cases. We report the case of a 45-year-old woman with morbid obesity and with breast carcinoma who was technically difficult to treat under fluoroscopic guidance due to very poor visualization secondary to her body habitus. It was possible to perform radiofrequency ablation and acetabuloplasty with the use of cone-beam computed tomography for guidance.

Résumé

L'acétabuloplastie est un traitement palliatif utilisé chez certains patients souffrant de maladies métastatiques douloureuses du bassin. Nous examinons le cas d'une femme de 45 ans souffrant d'obésité morbide et d'un carcinome mammaire techniquement difficile à traiter par guidage radioscopique en raison de la mauvaise visualisation attribuable à l'habitus. Une ablation par radiofréquence et une acétabuloplastie ont pu être réalisées en utilisant la tomodensitométrie à faisceaux coniques comme technique de guidage.

Key Words: Metastases; Acetabuloplasty; Cementoplasty; Radiofrequency ablation; Cone-beam computed tomography

Cementoplasty of the acetabulum (acetabuloplasty) has been a procedure performed almost as long as vertebroplasty has been [1]. The acetabulum was the first site outside the spinal column in which percutaneous injection of acrylic cement was used, principally for the treatment of painful metastatic disease. The complex 3-dimensional anatomy in this area makes visualization of the osseous landmarks challenging. Recently, several publications have appeared that described the usefulness of cone-beam computed tomography (CT) in facilitating the performance of vertebroplasty [2−4]. We postulated that this technique might be helpful in navigating needle placement and assessing cement distribution. Here, we describe our experience with using cone-beam CT in facilitating acetabuloplasty in a patient with bilateral acetabular metastases.

Case Report

A 45-year-old patient with a history of metastatic breast carcinoma presented with gradually increasing pain in both hips on weight bearing. Bilateral proximal femoral metastases were present and subsequently transfixed with gamma nails. Bilateral acetabular metastases were also present (Figure 1), which progressed to the point where, in the previous 4 weeks, the patient had been unable to bear weight at all and was restricted to a wheelchair. Transfers had become extremely painful. The patient was markedly obese, weighing 114 kg and measured 150 cm (body mass index, 51 kg/m^2).

Disclosures: Peter L. Munk is a recipient of research funds from Galil Therapeutics Inc and a speaker for Boston Scientific and Johnson & Johnson/DuPuy. The other authors have no conflicts of interest to disclose.

* Address for correspondence: Peter L. Munk, MD, CM, FRCPC, FSIR, Department of Radiology, University of British Columbia, Vancouver General Hospital, 899 West 12th Ave, Vancouver, British Columbia V5Z 1M9, Canada.

E-mail address: Peter.munk@vch.ca (P. L. Munk).

0846-5371/$ - see front matter © 2012 Canadian Association of Radiologists. All rights reserved.
doi:10.1016/j.carj.2011.12.003

Figure 1. Coronal reconstruction from computed tomography on bone windows, demonstrating the presence of bilateral destructive lesions in the acetabula as well as additional iliac lesions.

Our goal was to improve her quality of life by diminishing pain and improving mobility. We hoped to be able to achieve this goal by performing radiofrequency ablation for sterilization of as much of the tumour as possible and then by injecting methylmethacrylate cement (combined radiofrequency ablation and cementoplasty). This procedure has been described in a number of previously published reports as an effective and durable technique for palliation of bone metastases [5−7]. Fluoroscopic evaluation of the hips demonstrated very poor resolution of osseous structures in spite of tight coning done to minimize scatter radiation. On lateral and steep oblique fluoroscopy, the femoral heads and acetabulum could barely be discerned.

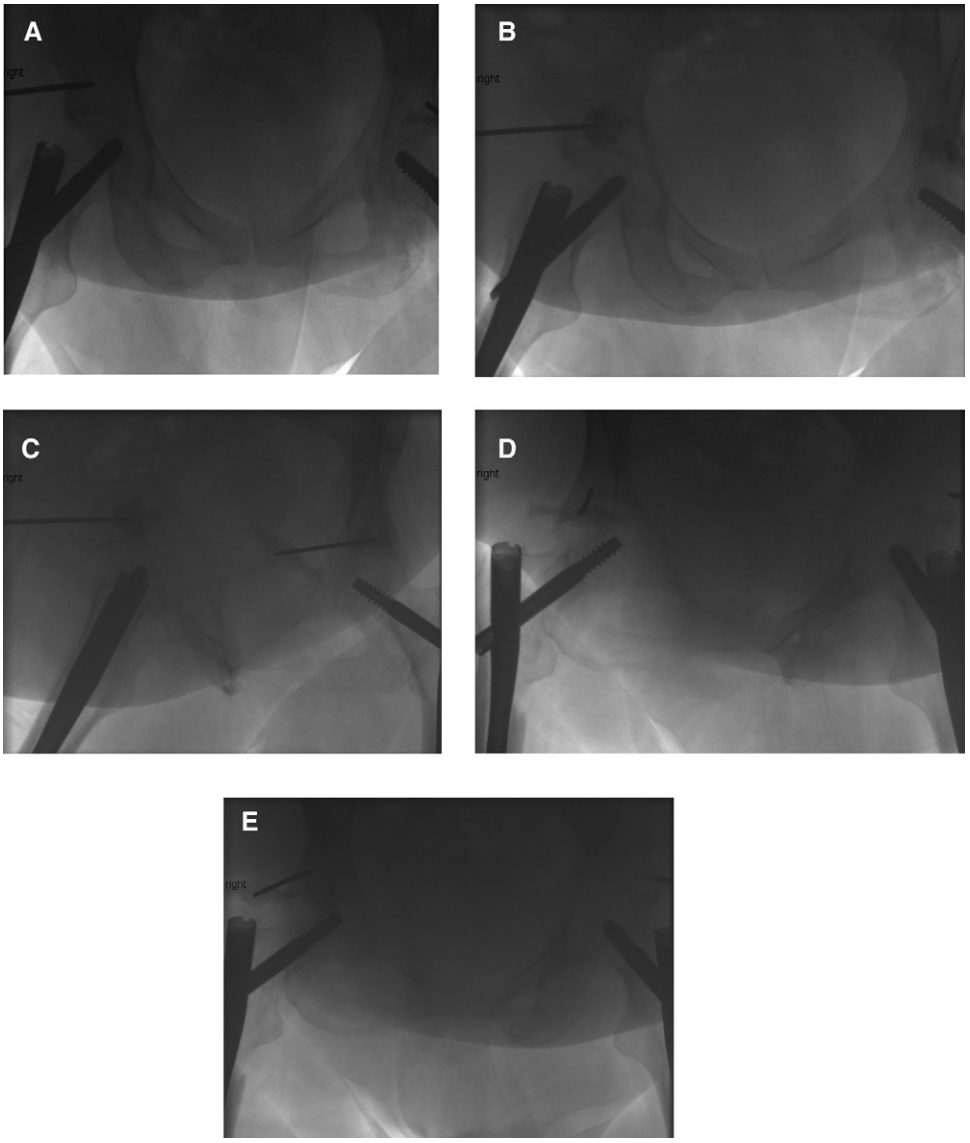

Figure 2. A series of planar images from a cone-beam computed tomography acquisition. (A) Vertebroplasty needles are present in the supra-acetabular regions bilaterally. (B−E) A series of images in different obliquities are provided, acquired periodically during injection of radiopaque cement. The image was degraded by the patient's body habitus.