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Case Report

Unusual Case of Acetabular Liner Dissociation Following Failure of Ceramic-On-Ceramic Bearing Total Hip Arthroplasty: A Case Report

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ABSTRACT

Modular hip implants can improve construct stability and the rate of volumetric wear in Total Hip Arthroplasty (THA), however, there is still a 0.2-10% risk of dislocation. We report the unusual case of a 54-year-old lady who presented with a dislocated migrated ceramic liner following a twisting injury. She had undergone a ceramic-on-ceramic THA five years earlier. This diagnosis of the dislocated liner was confirmed with computed tomography (CT) scanning. Review of National Joint Registry data showed ceramic-on-ceramic acetabular liner dissociation to be rarer than in those with metal-on-polyethylene (incidence 0.27 vs. 0.46 per 1000 prosthesis years). We suggest the liner may have migrated in retrograde along the iliopsoas. We recommend the use of cross-sectional imaging (CT) to assist in confirming the diagnosis and planning future surgery.

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Introduction

Modern Total Hip Arthroplasty (THA) tend to be modular in design. Modular hip implants provide an additional interface between the prosthetic head and the outer shell. This design allows you to change the effective head diameter and level of constraint in total hip arthroplasty which may, in turn, be beneficial by changing the rate of volumetric wear and improving stability respectively [1, 2]. Modularity allows a greater number of component combinations that can be tailored to the clinical needs and the patients' expectations, as well as the ability to exchange modular components in wear, infection, or recurrent dislocation [3]. Dislocation following THA ranges from 0.2-10% per year and patients must be consented for this pre-operatively [4, 5].

Case Presentation

Situation

Patient MA, a 54-year-old female, attended the emergency department with left hip pain after twisting whilst loading her left leg. She described a sudden discomfort and a crunching sensation. She had undergone a left

Exeter/Tritanium ceramic-on-ceramic total hip replacement 5 years before this for avascular necrosis of the left hip. Initial radiographs of the pelvis and hips demonstrated bilateral total hip replacements in situ. On the anteroposterior radiograph, it was noted that the femoral head was not centred within the acetabular component, in keeping with asymmetric wear (Figure 1). The patient had ongoing pain and re-presented to the emergency department 10 days later with a clunking sensation. Further radiographs confirmed that the femoral head was located within the acetabular component but was maintained in an eccentric position (Figure 2). Due to persistent symptoms, the patient was referred to a hip surgeon. Review of the previous radiographs taken in the emergency department revealed that there was an opacity seen in the left hemipelvis overlying the left ilium. The diagnosis of a dislocated ceramic liner was confirmed on computed tomography (CT) scanning (Figure 3). The patient was informed of this and placed on the urgent list for revision hip surgery.

During the revision surgery, the ceramic femoral head was seen lying in the metal acetabular component. The ceramic acetabular liner was not seen, nor was there any evidence of ceramic debris. The liner and head were changed to a Stryker dual-mobility construct. The patient made an

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uneventful postoperative recovery and reported no problems with the dislocated migrated ceramic liner retained within the pelvis (Figure 4).



Figure 1: AP radiograph pelvis.

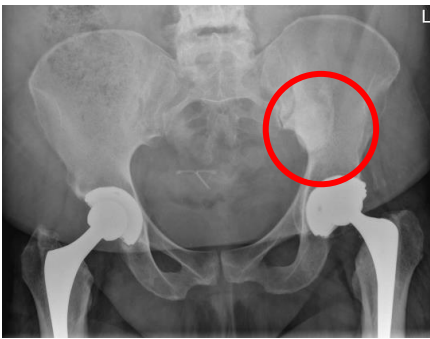


Figure 2: AP radiograph pelvis showing opacity over left iliac blade and non-concentric position of femoral head within the acetabular component.

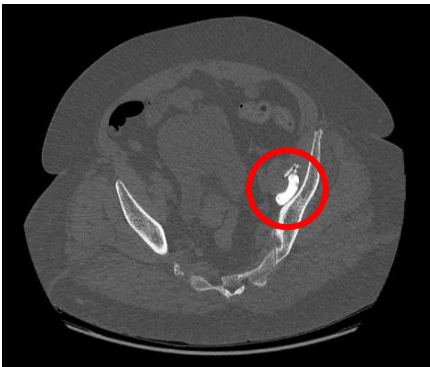


Figure 3: Axial CT radiographs. The dissociated component is ringed in red.



Figure 4: Post operative radiograph after revision hip surgery.

Discussion

In 2018, 27,605 (2.8%) of the 992,090 primary hip replacements had an associated first revision. A review of ten-year National Joint Registry (NJR) data shows an acetabular liner dissociation incidence of 0.27 per 1000 prosthesis years in uncemented ceramic-on-ceramic hips compared to 0.46 in metal-on-polyethylene [6].

Dissociation of liner components is uncommon, and migration of the liner is rarely cited. In previous cases of persistent hip pain following dislocation, CT and MRI imaging has shown that polyethylene hip liners can migrate to the soft tissues of the posterior thigh, and between the gluteus medius and minimus [7, 8]. Failure of the locking mechanism between the liner and the shell appears to be a common cause for failure and dissociation of these hips [3, 9]. Ceramics are more often associated with catastrophic failure and fragmentation of the liner, usually found within the acetabular shell in the surrounding soft tissues during revision [10]. In a systematic review performed by Traina *et al.* it was suggested that adjunctive CT scan be performed to refine the diagnosis and better characterise the mutual relationship between the cup and the stem in ceramic hips [11].

In this particular case, the ceramic liner had dissociated itself from the metal-backed liner and had migrated superiorly into the pelvis. This has not been described before in the literature and we suggest that it might have taken the route along the iliopsoas in a retrograde manner or posteriorly along the piriformis via the greater sciatic notch.

Message

It is important to suspect liner dissociation as a cause of sudden pain associated with a crunching sensation. Plain radiographs of the whole pelvis may reveal signs of potential liner dissociation usually around the hip and the surrounding soft tissues. However, very occasionally the liner may migrate further afield and, in these circumstances, cross-sectional imaging, namely computed tomography can be very helpful to confirm the diagnosis and plan further surgery.

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