

# Dissociation of Cemented Dual Mobility Socket from the Acetabulum in A Case of Recurrent Total Hip Arthroplasty Instability -A Novel Complication

Rakesh John<sup>1</sup>, Anuj Jain<sup>1</sup>, Shekhar Agarwal<sup>1</sup>, Simon Thomas<sup>1</sup>, Sunny Agarwal<sup>1</sup>

## Learning Point of the Article:

Beware of this unusual, novel complication when using cemented metal-backed dual mobility acetabular sockets in THA.

## Abstract

**Introduction:** Acute complete dissociation of a cemented socket from the acetabular cavity is very rare and has been described only in relation to closed reduction maneuver of a dislocated hip arthroplasty.

**Case Report:** We present a case of recurrent hip dislocation in a 70-year-old female post total hip arthroplasty for which a cemented dual mobility (DM) component was used. The cemented socket dissociated from the acetabular cavity with the polyethylene liner insitu 1-year post-surgery. It was not related to intraprosthetic dislocation as the acetabular liner-socket interface was not disrupted. A re-revision of the acetabular component was done with an acetabular reinforcement cage, cemented cup, and constraint acetabular liner. No such case of cup dissociation has been reported in the literature till date.

**Conclusion:** The use of cemented DM cups without acetabular reinforcement devices has been described recently and is still controversial. Surgeons should be aware of the possibility of such a complication when using metal-backed cemented DM cups.

**Keywords:** Dislocation, dissociation, dual mobility, hip arthroplasty.

## Introduction

Dislocation is the most common reason for revision after total hip arthroplasty (THA) after both primary and revision surgeries [1]. Farizon et al. [2] developed the dual mobility (DM) socket in 1974 to increase the stability of the THA implant. Due to the dual articulation, larger jump distance and the greater range of motion before impingement, the rate of dislocation is significantly reduced with a DM cup [3, 4]. The use of a DM hip in a revision surgery for THA instability is an attractive option as the rate of dislocation after revision arthroplasty is higher compared to primary THA [3]. DM implants are increasingly being used in cases with high risk of post-operative instability. However, the DM cup has its own set of complications such as intraprosthetic dislocation (IPD) and

accelerated wear of liner. [3, 5] Furthermore, the use of cemented DM cups is relatively new and controversial [6, 7]. In this case report, we present a case where a metal-backed, cemented DM socket was used to revise an uncemented THA with recurrent instability and the entire socket, along with the polyethylene (PE) liner insitu, dissociated from the acetabulum 1 year later. Such a complication is unusual and has not been reported in the literature till date.

## Case Report

A 70-year-old female, known case of rheumatoid arthritis underwent elective, uncemented THA of the left hip in 2015 for severe destructive arthropathy through the posterolateral

Access this article online

Website:  
www.jocr.co.in

DOI:  
2250-0685.1252

## Author's Photo Gallery



Dr. Rakesh John



Dr. Anuj Jain



Dr. Shekhar Agarwal



Dr. Simon Thomas



Dr. Sunny Agarwal

<sup>1</sup>Department of Orthopaedics, Sant Parmanand Hospital, Civil Lines, New Delhi, India.

### Address of Correspondence:

Dr. Rakesh John,  
Department of Orthopaedics, Delhi Institute of Trauma and Orthopaedics, Sant Parmanand Hospital, New Delhi - 110054, India.  
E-mail: rakeshjohn23@gmail.com



**Figure 1:** Plain radiograph after primary total hip replacement showing anteverted acetabular cup.



**Figure 2:** Plain radiograph after the 3rd episode of dislocation.



**Figure 3:** Plain radiograph after revision with cemented dual mobility socket.



**Figure 4:** Plain radiograph depicting complete dissociation of dual mobility socket from the acetabular cavity.

approach (Fig. 1). She sustained three episodes of dislocation at 2, 3, and 5 weeks post-surgery secondary to acetabular component malpositioning. A revision of the acetabulum component was performed after the third episode of dislocation and a cemented DM socket (Cotyle double mobilite, Evolutis, Briennon, France) was implanted using standard operative technique (Fig. 2). Following this revision surgery, the patient was asymptomatic for the next 1 year when she sustained a trivial fall in the bathroom. She was unable to bear weight at presentation. Plain radiograph revealed a completely dissociated acetabular socket lying outside the acetabulum (Fig. 3). She was taken up for re-revision surgery. The DM socket had reposed back into the acetabulum on surgical exposure and was completely loose (Fig. 4). The socket was extracted with the liner insitu (Fig. 5). An acetabular reinforcement cage (Burch-Schneider™ reinforcement cage; Zimmer, Warsaw, IN) along with a cemented socket and constraint acetabular liner (ZCA®; Zimmer, Warsaw, IN) was implanted with a 28 mm head (Fig. 7). At the latest follow-up (1 year), the patient was mobile, asymptomatic and had no further episodes of instability.

### Discussion

Dissociation of the cemented socket or cemented stem after THA is an extremely rare complication and has been only reported during closed reduction maneuvers in an already dislocated total hip replacement. Dissociation of cemented femur stems from the femoral canal during closed reduction has been described multiple times in the literature [8, 9, 10, 11, 12, 13, 14]. However, dissociation of the cemented acetabular socket is very unusual. Tamura et al. [15] reported the first case of a cemented cup dissociation which occurred during the

closed reduction of a dislocated THA. This dissociation of the cup was secondary to fractured ceramic screws which were used to secure bone graft which was used to fill defects superior to the acetabulum. However, the cup was not completely displaced from its position like in our case. After a careful search of the literature, we could not find any other published case report/series where a complete dissociation of the cemented acetabular cup has been described. Furthermore, no such case has been reported in any series involving follow-up of metal-backed, cemented DM cups. DM sockets have demonstrated a reduced dislocation rate in revision hip arthroplasty and also in recurrent THA instability [4, 16, 17, 18, 19]. Although the dislocation rate is reduced considerably with the use of DM sockets, it is associated with a unique and troublesome complication - IPD [4, 5, 20]. Here, the mobile PE liner dissociates from the socket and is displaced, whereas the femoral head continues to articulate with the acetabular socket. Philippot et al. [5] reported the largest series of IPD and devised a classification system for the same. Type III IPD is associated with cup loosening. In the case, we have reported, the liner was not dissociated from the acetabular socket, therefore, ruling out IPD. The most important reason for dissociation, in this case, is the weak bonding between the cement and the metal-backed socket. The use of cemented DM cups has been controversial. Cemented DM sockets were initially developed to be used in conjunction with acetabular reinforcement cages in cases with deficient acetabular bone stock [6]. The use of cemented DM cups without reinforcement devices has only been described recently. Many studies have advised against the use of cemented DM cups without reinforcement devices for the fear of increased risk of acetabular component loosening [6, 21, 22].



**Figure 5:** Intraoperative picture showing loose socket which had spontaneously reposed itself back into the acetabular cavity.



**Figure 6:** Picture showing the extracted dual mobility socket; note the absence of cement-implant bonding.



**Figure 7:** Post-operative plain radiograph after revision with acetabular reinforcement cage and constraint acetabular liner.

On the other hand, few recent midterm outcome studies have demonstrated good results where a cemented DM socket has been used without acetabular reinforcement devices in revision THA for post-THA instability [7,16,19].

### Conclusion

To summarize, although DM sockets reduce the dislocation rates in recurrent THA instability, uncemented DM sockets should be preferred over cemented sockets. Surgeons should be aware of the possibility of dissociation of the acetabular

component with the use of a metal-backed cemented acetabular cup without a reinforcement device.

### Clinical Message

Metal-backed cemented DM acetabular components can be associated with complete cup dissociation; uncemented DM cups should be preferred over metal-backed cemented acetabular components.

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**Conflict of Interest:** Nil

**Source of Support:** Nil

**Consent:** The authors confirm that Informed consent of the patient is taken for publication of this case report

#### How to Cite this Article

John R, Jain A, Agarwal S, Thomas S, Agarwal S. Dissociation of Cemented Dual Mobility Socket from the Acetabulum in a Case of Recurrent Total Hip Arthroplasty Instability -A Novel Complication. *Journal of Orthopaedic Case Reports* 2018 Nov-Dec; 8(6): 46-49.