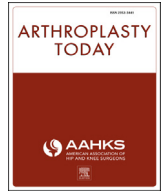




Contents lists available at ScienceDirect

## Arthroplasty Today

journal homepage: <http://www.orthoplastytoday.org/>

## Case report

## Intraoperative femoral head dislodgement during total hip arthroplasty: a report of four cases

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## ARTICLE INFO

## Article history:

Received 22 June 2017

Received in revised form

2 August 2017

Accepted 7 August 2017

Available online xxx

## Keywords:

Total hip arthroplasty

THA

Complications

Femoral head dislodgement

## ABSTRACT

Dislodgment of trial femoral heads and migration into the pelvis during total hip arthroplasty is a rarely reported complication with limited published cases. There are three primary mechanisms of femoral head separation: dislodgement during reduction attempt, disassociation from anterior dislocation while assessing anterior stability, and during dislocation after implant trialing. If the trial femoral migrates beyond the pelvic brim, it is safer to finish the total hip arthroplasty and address the retained object after repositioning or in a planned second procedure with a general surgeon. We recommend operative retrieval since long-term complications from retention or clinical results are lacking.

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## Introduction

Total hip arthroplasty (THA) is one of the most successful and cost-efficient procedures in medicine; however, complications may occur up to 22% [1–4]. Dislodgement of trial femoral heads and migration into the pelvis is a rarely reported complication with only 14 published cases [5–18]. Although a handful of reports are described in the literature, the true incidence of this complication is unknown. We present 4 cases of femoral head disassociation into the pelvis and evaluate different variables that place patients at a higher risk for this complication (Table 1). We also provide an algorithm and recommendations for management based on cumulative experience and literature review.

## Case histories

## Case 1

A 63-year-old female with body mass index (BMI) of 46.1 kg/m<sup>2</sup> and history of deep vein thrombosis and hypertension underwent a

left cementless THA using a minimally invasive Watson-Jones approach [19] in the lateral decubitus position. After placement of the acetabular component and broaching of the femur for a taper wedge stem, a trial reduction was performed with a lateralized offset neck and a 36-mm +5 head. During the reduction process, the trial head dissociated from the neck and dislodged into the iliopsoas sheath through the rent from the anterior capsulotomy (Fig. 1). Multiple unsuccessful attempts were performed with curved Kelly clamps and inflation of a Coude catheter. The THA was completed in a routine manner with an intraoperative consult to general surgery. Immediately after closure, the patient was repositioned in a supine position to allow access to the retroperitoneum via a left ilioinguinal approach for successful retrieval. The patient was immediately mobilized without restrictions postoperatively and discharged home on postoperative day 2, without further complication.

## Case 2

A 45-year-old male with BMI of 30.1 kg/m<sup>2</sup> and history of right indirect inguinal hernia repair underwent left cementless THA via a traditional posterior approach. Before trialing, large anterior, inferior, and posterior marginal osteophytes were removed after polyethylene liner placement. After broaching a fit and fill stem, a 28-mm +2.5 trial head was used for range of motion and stability assessment. At extreme extension and external rotation, the femoral neck abutted the posterior wall and the hip dislocated

One or more of the authors of this paper have disclosed potential or pertinent conflicts of interest, which may include receipt of payment, either direct or indirect, institutional support, or association with an entity in the biomedical field which may be perceived to have potential conflict of interest with this work. For full disclosure statements refer to <https://doi.org/10.1016/j.artd.2017.08.002>.

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<https://doi.org/10.1016/j.artd.2017.08.002>

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**Table 1**  
Case history summary.

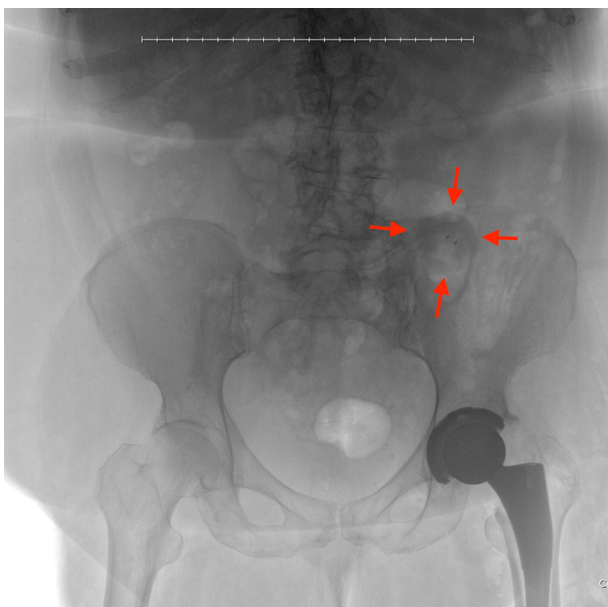
Patient	Age, y	Gender	BMI, kg/m <sup>2</sup>	Approach	Vendor	Mechanism	Trial head size	Morse taper	Imaging	Retrieval	Timing	Retrieval approach
1	63	F	46.1	Anterolateral MIS	DePuy Synthes	Reduction attempt	36 mm +5	12/14	XR	Yes	Initial operation	Ilioinguinal
2	45	M	30.1	Posterior	Stryker Osteonics	Anterior stability assessment	28 mm +2.5	V40	XR	Yes	Initial operation	Ilioinguinal
3	68	F	30.2	Posterior	Stryker Osteonics	Dislocation after trialing	28 mm +7	V40	XR	Yes	Initial operation	Ilioinguinal
4	55	F	42.8	Mini posterior	Zimmer Biomet	Anterior stability assessment	32 mm +5	12/14	XR	Yes	Initial operation	Modified Stoppa

XR, x-ray.

anteriorly causing head dislodgement along the anterior pelvic brim. Multiple unsuccessful attempts including a trochanteric osteotomy were performed to retrieve the trial head. Similar to case 1, the final components were implanted and the patient was repositioned for an ilioinguinal approach by general surgery. The trial was retrieved underneath the psoas fascia. The patient progressed well postoperatively without complications with a healed osteotomy site at the latest follow-up at 5 years.

#### Case 3

A 68-year-old female with BMI of 30.2 kg/m<sup>2</sup> with history of hypertension and anemia underwent a left cementless THA through a posterior approach. During the dislocation process after trialing the implants, the 28-mm +7 trial femoral head was disassociated from the fit and fill stem trunnion and progressed along the psoas sheath. The trial head was irretrievable through the posterior incision. After final component implantation, the patient was positioned supine for general surgery to perform an ilioinguinal approach to retrieve the trial head. After successful retrieval, the patient was permitted to weight bear as tolerated postoperatively with an uneventful hospital course and no further complications.



**Figure 1.** Inverted kidney, ureter, and bladder (KUB) radiograph demonstrating subtle radio-opaque density (arrows) with 2 metallic dots inside the trial femoral head.

#### Case 4

A 55-year-old female with BMI of 42.8 kg/m<sup>2</sup> and history of hypertension and coronary artery disease underwent a left cementless THA with a mini posterior approach. During the trial reduction, while assessing anterior stability with hip extension and external rotation, the 32-mm +5 trial head dislocated of the fit and fill stem and slipped anteriorly into the psoas sheath. While manually palpating along the sheath, the trial femoral head moved further into the sheath and pelvis. After multiple failed rescue attempts, the patient was repositioned supine after final component implantation. A lateral window modified Stoppa approach was used to obtain femoral head within the iliacus muscle. The remainder of the patient's hospital course was routine with home discharge on postoperative day 2 without further complication.

#### Discussion

Despite great clinical outcomes and patient satisfaction rates [20], intraoperative complications during THA are not uncommon, occurring in approximately 5.4% of cases, with femur fractures occurring most commonly [21]. Trial femoral head dislocation into the retroperitoneum is a much rarer complication with limited previous reports (Table 2) [5–18]. Although the overall occurrence rate is undetermined, the incidence of this complication at our institution for 34,198 primary THAs from 1998 to present was extremely rare at 0.01%.

#### Mechanism of disassociation

There are three primary mechanisms of femoral head separation: dislodgement during reduction attempt, disassociation from anterior dislocation while assessing anterior stability, and during dislocation after implant trialing. Although our patients suffered this complication from all three mechanisms, dislocation after stability assessment has been described most frequently in 11 patients [5,7–11,13,15–17]. Four patients [6,14] lost femoral heads after anterior stability evaluation, 2 patients [6,12] from attempted hip reduction for trialing, and 1 patient during reduction after implantation of final components [18]. The femoral head most commonly dislodges along the anterior pelvic brim with majority migrating adjacent, beneath or along the iliopsoas through the lacuna musculorum of the inguinal canal into the iliac fossa [16]. However, one study reported migration within the pelvic quadrilateral space related to accidentally pushing the trial inferiorly during retrieval attempt [14].

Anterior dislodgement occurred in all our patients (1 anterolateral and 3 posterior) and reported cases regardless of surgical approach (4 anterolateral [5,7,13], 4 direct lateral [8,9,12,15,18], and 9 posterior [6,10,11,14,17]). This may be ascribed to the soft tissue rent created in the anterior capsule for retractor placement in all approaches. Two

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