

# Anterior Dislocation After Total Hip Arthroplasty: A Rare Complication

Swapnil Anil Keny (✉ [swapnilakeny@gmail.com](mailto:swapnilakeny@gmail.com))

Seth GS Medical College and KEM Hospital <https://orcid.org/0000-0003-2940-6752>

**Shubhranshu Mohanty**

Seth Gordhandas Sunderdas Medical College: King Edward Memorial Hospital and Seth Gordhandas Sunderdas Medical College

**Tushar Rathod**

Seth Gordhandas Sunderdas Medical College: King Edward Memorial Hospital and Seth Gordhandas Sunderdas Medical College

**Prashant Kamble**

Seth Gordhandas Sunderdas Medical College: King Edward Memorial Hospital and Seth Gordhandas Sunderdas Medical College

**Ronak Kothari**

Seth Gordhandas Sunderdas Medical College: King Edward Memorial Hospital and Seth Gordhandas Sunderdas Medical College

---

## Research Article

**Keywords:** Anterior dislocation, Total hip arthroplasty, Complication

**Posted Date:** November 19th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-782990/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

Anterior dislocation after total hip arthroplasty (THA) is a rare event and its treatment protocol is controversial. The most important factor responsible for this complication is malposition of the components. We present a rare case of early anterior dislocation after THA in a 72-year female due to excessive anteverted position of the acetabulum socket as confirmed by radiological evaluation. Closed reduction was not successful. Revision surgery with correction of acetabulum cup version and inclination within the 'safe zone' resulted in excellent stability of prosthesis intra-op which even precluded the use of advanced implant designs such as constrained liners. At one-year follow-up, the patient is mobilized with a walking stick and has no recurrence of dislocation. This highlights the role of proper implant positioning which can reduce the complexity of the surgical procedure and provide good functional outcome in such catastrophic events.

## Introduction

The incidence of dislocation after primary total hip arthroplasty (THA) is around 0.2–1.7 % and is even higher in revision cases (1). Anterior dislocation following THA is a rare phenomenon and hence their management guidelines are not properly defined. Component malposition is the most common etiology responsible for this complication in the early post-operative period. We present a case of anterior dislocation of THA due to improperly placed cup managed with revision surgery. Our aim is to highlight the importance of this rare complication and provide insights into the treatment protocol.

## Case Details

The patient was a 72-year female who had a cemented bipolar hemiarthroplasty done for fracture neck of femur 15 years ago via anterolateral approach. After 15 years of the index surgery, the patient developed pain and difficulty in walking for which revision of bipolar to a hybrid THA was performed via standard posterior approach. One month after the revision surgery, the patient heard a sudden pop and experienced severe pain while getting up from bed. She presented to the emergency department with severe pain and inability to ambulate. The patient had no associated medical comorbidities and was not obese (BMI: 29.2). X-rays confirmed anterior dislocation of the prosthesis head which was buttonholed through the anterior musculature and was palpable under the skin (Fig. 1). The greater tuberosity showed signs of non-union and the cup was migrated medially with screw penetration into the true pelvis. CT scan confirmed malposition of the acetabulum cup in excessive anteversion (55°) (Fig. 1). CT angiography revealed no vascular impingement by the screw. Serum markers (ESR-20 & CRP-5.6) were normal.

Closed reduction was attempted in the emergency department under anaesthesia but was unsuccessful. As component malposition seemed the most probable etiology, the patient was planned for a revision surgery via standard posterior approach. The excess anteversion of the acetabulum socket was confirmed on table (Fig. 2). It seems that probably the previous surgeon found instability on table and to prevent that put a constrained liner. However, the absence of the metallic restraint ring in the X-ray

prevented us to think about the presence of constrained liner, which came as a surprise intraoperative finding. The removal of the liner was challenging because of the embedded metal ring within it. The retrieval of the prosthesis head needed sustained traction and internal rotation. As the stem was well-fixed with adequate anteversion, no revision was performed on the femoral side. After subsequent preparation of the acetabulum, final prosthesis (DePuY Gription cup size 54 with four screws and lipped polyethylene liner, metal head size 36) was implanted along with medial cancellous bone grafting. Reduction was done and stability was confirmed on table without any posterior or anterior impingement (Fig. 3). The greater trochanter fragment was cleaned of excess cement mantle and re-wiring was performed with added cancellous bone grafting. Post-operative x-ray and CT confirmed proper implant position with corrected anteversion of the cup (Fig. 4). The patient was kept on in-bed static exercises for 3 weeks following which partial weight bearing mobilization was started. At one-year follow-up, the patient had no recurrence of dislocation and was mobilized full-weight bearing using a tripod stick.

## Discussion

Dislocation can be anterior or posterior; each having its own peculiar etiologies, anatomic and pathologic features. The ratio of anterior to posterior dislocation in primary THA is around 1:4.6. Thus, it is imperative to identify the differences in these two types for prevention, early diagnosis and treatment of these complications.

Anterior dislocation following THA is a rare occurrence, irrespective of the surgical exposure used. Patient factors such as neuromuscular disorders (Parkinson's disease, epilepsy), obesity, alcohol consumption, scar tissues from previous surgeries can also contribute to hip instability (1). Of all the risk factors, component malposition is the most important and strongly associated with anterior hip dislocation. During THA, surgeons rely on bony landmarks such as anterior pelvic plane (APP) as reference markers to decide the cup position. The transverse acetabular ligament also serves as an intraoperative landmark for assessment of inclination and cup version. Changes in pelvic tilt, improper patient positioning, loss of bony landmarks due to fibrosis or prior surgeries or inadequate surgical experience may lead to excessive anteversion of the cup and/or the stem leading to impingement and subsequent dislocation. Many surgeons who regularly practice the posterior approach tend to place the cup in excess anteversion to minimize the risk of posterior instability. This when combined with excess anteverted stem or abnormal pelvic tilt can also predispose to anterior dislocation. Small femoral head sizes (22,28) tend to dislocate more likely due to reduced jump height (2).

Closed reduction and immobilization in a 'desk-chair position' is a successful mode of treatment in primary and recurrent anterior dislocations as well. Schino et al. reviewed 19 cases of anterior dislocations treated conservatively with good outcome (3). They proposed an excess femoral and acetabulum anteversion of 10° compared to the healthy side as an important risk factor. Elderly patients are more prone to progressive posterior pelvic tilt due to thoracolumbar kyphosis which can lead to late onset anterior hip instability even in cases wherein the placement of the cup was initially appropriate (4).

Even though anterior dislocation following THA is a rare occurrence, surgeons should be vigilant regarding this untoward complication. Prevention of excessive anteversion of cup and maintaining the combined anteversion in the 'safe zone' is the key surgical step. In our case, proper component position even precluded the use of constrained liner during the revision surgery. Removal of the constrained liner may pose a challenge due to the presence of the metal ring within the polyliner. Intra-operative assessment of stability is crucial and use of lipped or constrained liners should be encouraged for added stability. Patients who are elderly should be advised regular follow-up to look for progressive pelvic tilt to prevent late onset instability.

## Conclusion

Prevention of excessive acetabulum and/or femoral anteversion is the key step to prevent early onset anterior hip instability in primary or revision THA.

## Declarations

- i. Funding: NIL
- ii. Conflicts of interest/Competing interests: On behalf of all authors, the corresponding author states that there is no conflict of interest.
- iii. Ethics approval: NOT APPLICABLE
- iv. Consent to participate: A written well-informed consent has been taken from the patient regarding presentation of the facts regarding the case.
- v. Consent for publication: A written well-informed consent has been taken from the patient.
- vi. Availability of data and material (data transparency): NOT APPLICABLE
- vii. Code availability (software application or custom code): NOT APPLICABLE
- viii. Authors' contributions
  - a. Author 1: Conceptualization; Manuscript writing
  - b. Author 2: Operating surgeon; Supervision
  - c. Author 3: Supervision; Proof reading
  - d. Author 4: Supervision; Proof reading
  - e. Author 5: Manuscript editing; Patient follow-up

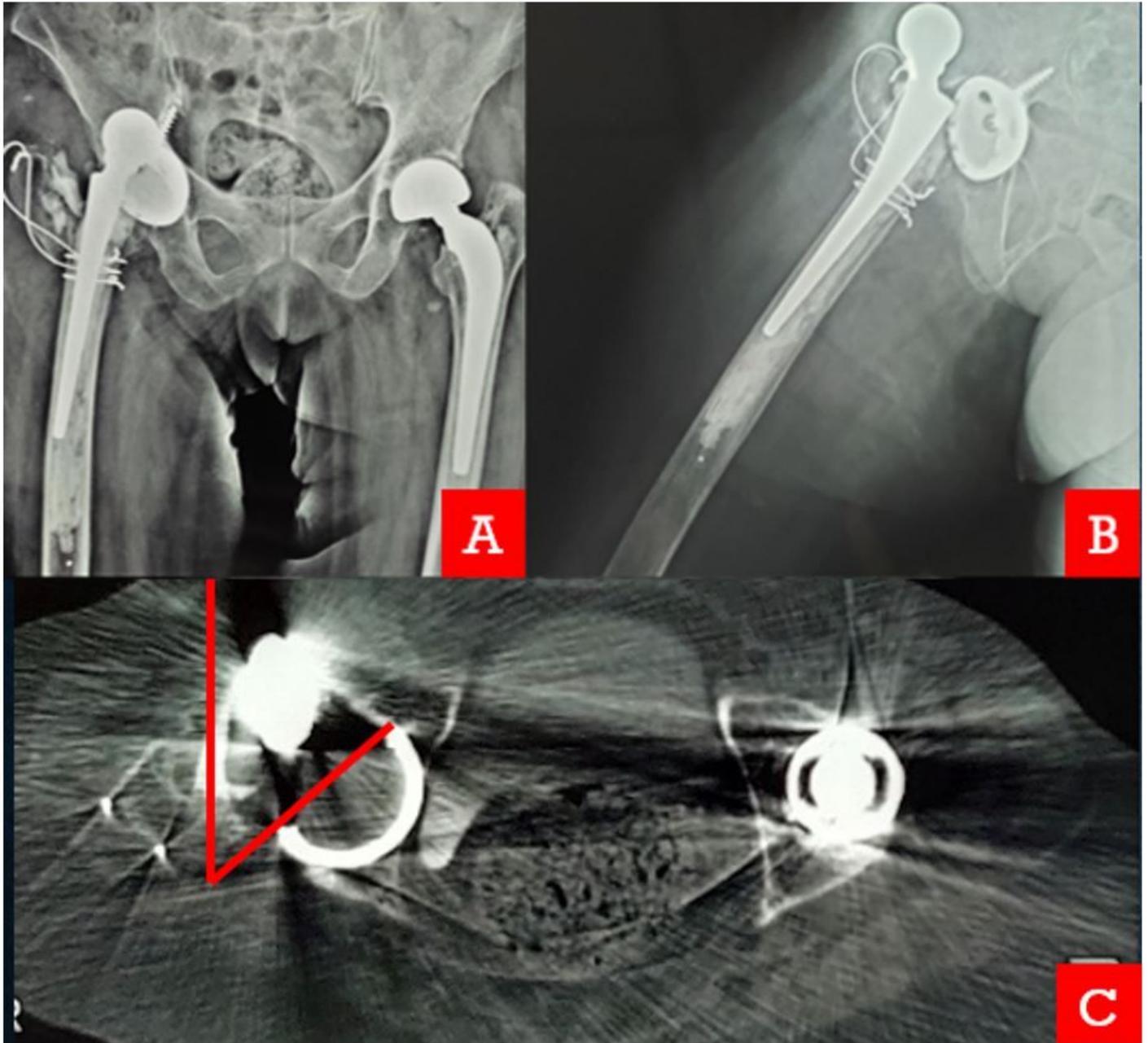
### Conflict of Interest:

On behalf of all authors, the corresponding author states that there is no conflict of interest.

## References

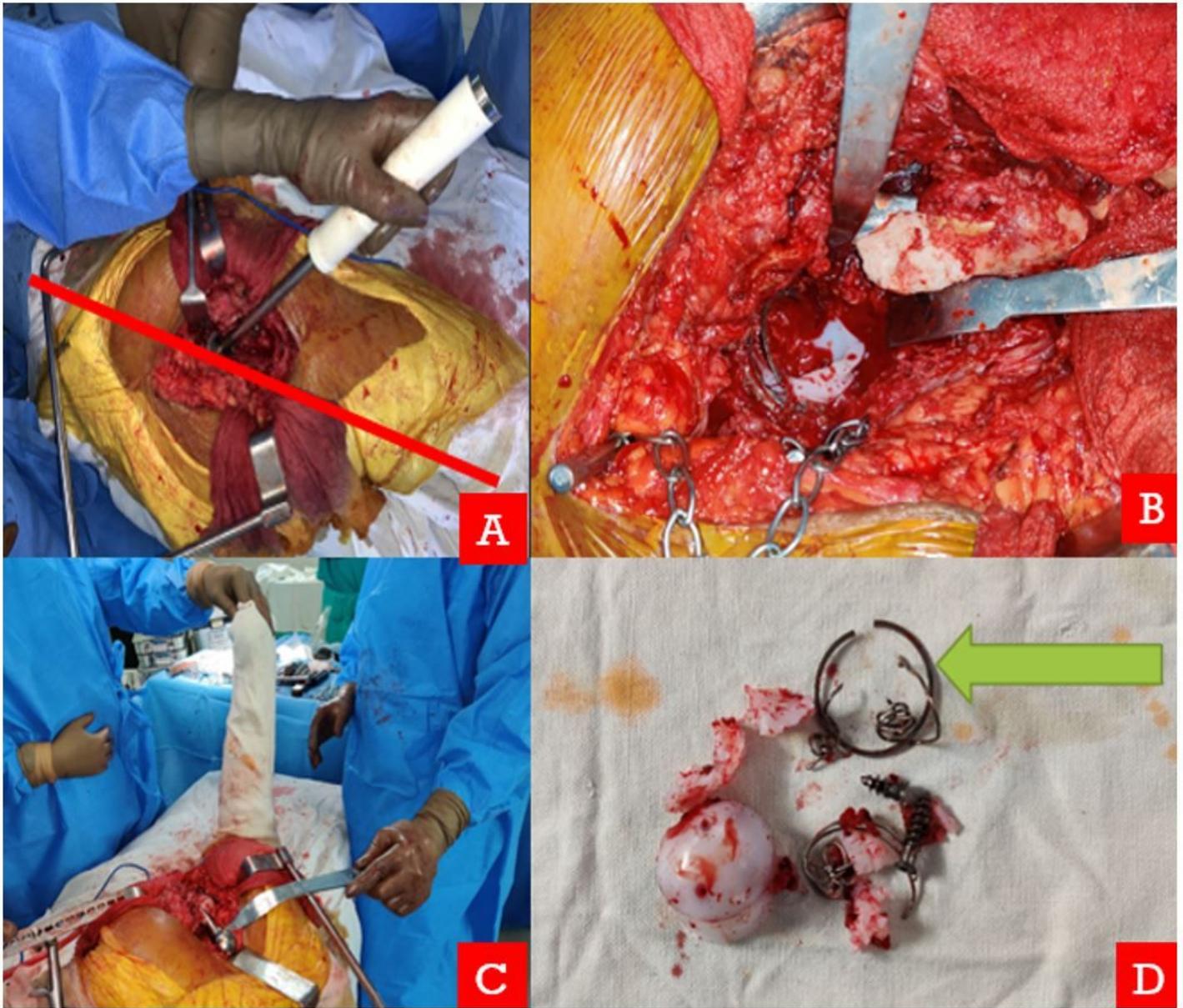
1. Zahar A, Rastogi A, Kendoff D. Dislocation after total hip arthroplasty. *Curr Rev Musculoskelet Med*. 2013;6(4):350–6. doi:10.1007/s12178-013-9187-6.
2. Plate JF, Seyler TM, Stroh DA, Issa K, Akbar M, Mont MA. Risk of dislocation using large- vs. small-diameter femoral heads in total hip arthroplasty. *BMC Res Notes*. 2012;5:553. Published 2012 Oct 5. doi:10.1186/1756-0500-5-553.
3. Di Schino M, Baudart F, Zilber S, Poignard A, Allain J. Anterior dislocation of a total hip replacement. Radiographic and CT-scan assessment. Behavior following conservative management. *Orthop Traumatol Surg Res*. 2009 Dec;95(8):573-8. doi: 10.1016/j.otsr.2009.08.003. PMID: 19945930.
4. Kobayashi H, Nakashima Y, Yamamoto T, et al. Late anterior dislocation due to posterior pelvic tilt in Total hip Arthroplasty. *Open Orthop J*. 2016;10:206–12.

## Figures



**Figure 1**

Pre-operative evaluation: Anteroposterior (A) and lateral (B) radiographs reveal anterior dislocation of THA with medialization of cup and screw penetration in the true pelvis. CT scan (C) confirms excessively anteverted position of the cup responsible for the anterior dislocation.



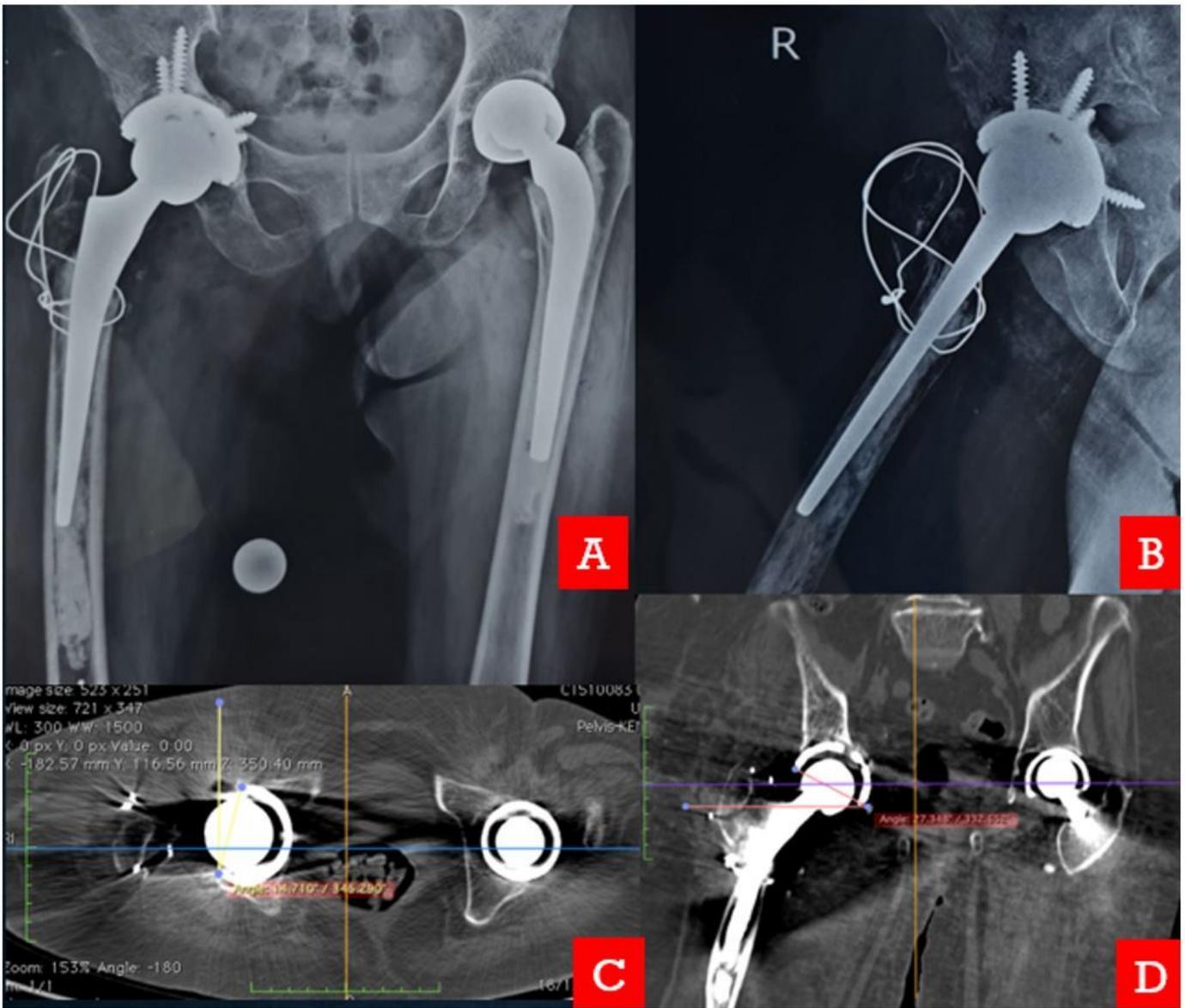
**Figure 2**

Intra-operative assessment: Assessment of excessive anteversion of acetabulum cup during surgery (A). Intraoperative finding of constrained liner without the metallic restraint ring (B). Stem was well-fixed and in adequate version needing no revision on the femoral side (C). Explanted liner which was removed piecemeal with difficulty due to the embedded metal ring within the constrained liner (D).



**Figure 3**

Stability assessment intraoperative: The final prosthesis was stable without any anterior or posterior impingement. Correction of component position deterred the need of constrained liner during revision surgery.



**Figure 4**

Post-operative assessment: Post-operative radiographs (A, B) confirming the position of the head well within the acetabulum socket. CT scan (C, D) shows appropriate anteversion and inclination of the cup reiterating that component position is the key to stability post THA.