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# A technique to remove a stable all-polyethylene cemented acetabular liner in revision hip arthroplasty: A case report



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## ABSTRACT

**INTRODUCTION:** The removal of a well-fixed acetabular component in a total hip arthroplasty can cause bone fractures, excessive bleeding, as well as extended bone loss. The reimplantation of a new acetabular component may be compromised.

**PRESENTATION OF CASE:** We report a technique using 2 cork-screws for removal a stable cemented acetabular component for the treatment of a recurrent dislocation of a cemented total hip arthroplasty, due to acetabular malposition.

**DISCUSSION:** A diversity of approaches and tools has been used for extraction of the acetabular prosthesis. Using 2 cork-screws it is possible to create fissures and fractures into the cement mantle, and greater manual control is obtained facilitating the manipulation of the acetabular component in different directions. The cup-cemented bond can be disrupted, the host bone is preserved and the risks of complications are minimized.

**CONCLUSION:** This technique is simple, available in any environment, reproducible, non-costly, non-timing consuming and safe.

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## 1. Introduction

Revision of the acetabular component in total hip arthroplasty occurs for reasons such as polyethylene wear and osteolysis, recurrent dislocation, and mechanical failure. Removal of a loose cemented acetabular liner is straightforward. Contrary, the removal of a well-fixed cemented acetabular can cause bone fractures, excessive bleeding, as well as extended bone loss, namely in osteoporotic bone [1,2].

The indications for revision of a well-fixed acetabular component include malposition, infection or polyethylene wear. There have been many techniques documented for removal of the acetabular component [3]. This can be achieved with the use of drills, screws, reamers, curved blades, gouges, chisels, and osteotomes. In revision hip arthroplasty one of the priorities of the surgeon must be the preservation of the remaining bone stock of the acetabulum. We report a technique using 2 cork-screws for removal a stable cemented acetabular component due to malposition.

## 2. Case report

A 74-year-old woman underwent a revision hip surgery for the treatment of a recurrent dislocation of a cemented total hip arthroplasty (eight dislocations), by malposition of the acetabular component (Fig. 1).

The all-polyethylene acetabular liner was perforated with a 4.5 mm drill, and two cork-screws were firmly screwed in the rim as far as possible, in order to extrude the liner from the cement mantle, and to create also fissures into the cement (Fig. 2). Manual torsional shear forces were carried out, which led to a total disruption of the polyethylene liner at the polyethylene-cement interface. Adequate manual torsional shear forces were carried out, which led to the disruption of the polyethylene liner at the cement-polyethylene interface, with no technical difficulties. The polyethylene cup was removed with ease. Using cement-splitting osteotomes, the cement mantle was removed in a piecemeal fashion and the cemented plugs were carefully curetted out. A roof reinforcement ring and a cemented cup of UHMW polyethylene were implanted using the standard technique. The metallic femoral head was changed and the femoral cemented stem was retained. No complications were reported in the perioperative course or during the hospitalization period. At 2 month postoperatively the patient was clinically able to walk without external support.

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**Fig. 1.** Anteroposterior radiographs of the left hip showing a dislocation of a cemented total hip arthroplasty with a stable acetabular component, at follow-up period of 4 years. After closed reduction, it was possible to observe the malposition of the acetabular component: low anteversion of the liner with an inclination angle of 57 degrees.



**Fig. 2.** The extraction of the liner was carried out by two cork-screws firmly screwed, as far as possible, in the rim of the all-polyethylene cemented acetabular liner.

### 3. Discussion

Well-fixed acetabular component may be removed in cases of recurrent dislocations by malposition of the acetabular prosthesis. Removal of a stable cemented acetabular component in revision total hip arthroplasty can be challenging, time consuming, and potentially detrimental to the remaining host bone [3,4].

The technique depicted here has been used successfully in our unit for several years, in cases where the polyethylene cemented liner presented no signs of loosening. The acetabular implant and the cement may be removed safely, under direct vision. On the other hand, if this technique fails it is possible to carry out others methods for the extraction of the acetabular implant. The removal process

can be performed with sequential acetabular reamers to thin the liner, and allow easier extraction of the implant [4].

The cork-screw femoral head extractor is a standard instrument in orthopedic surgery, found in most hip hemi-arthroplasty instrument sets. The cork-screws cause fissures and fractures in the cement mantle. The bone cement (polymethylmethacrylate) is strong in compression, but breaks when twisted [5]. Greater manual control is obtained, facilitating the manipulation of the acetabular component in different directions, tensile forces are applied, and the cup-cemented bond can be disrupted. The cement mantle may be removed in a piecemeal fashion, the host bone is preserved and the risks of complications are minimized. Utilizing simple instrumentations, a new acetabular prosthesis may

be implanted in adequate technical conditions. To our knowledge, this procedure using two cork-screws for removal an acetabular implant has not been described in orthopedic literature.

#### 4. Conclusion

One of the more difficult procedures in revision total hip arthroplasty is removal of a well-fixed femoral stem or acetabulum. The procedure described here for removal a well-fixed cemented acetabular component using 2 cork-screws is a simple, reproducible, non-timing consuming, non-costly, and bone preserving technique.

#### Conflict of interest

The authors declare that they have no competing interests.

#### Funding

None.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A

copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

#### Author contribution

All authors contributed to the writing and collection of data, and they have participated in the surgery.

All authors read and approved the final manuscript for submission.

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