

**TECHNICAL NOTE**

# Acetabular Screw in Close Proximity to the Posterior Branch of the Internal Iliac Artery in Revision Hip Surgery with Intrapelvic Migration of Acetabular Component: Preoperative Placement of a Fogarty Catheter in the Internal Iliac Artery (Case Report)

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*Received: 19 January 2022*

*Accepted: 23 June 2022*

**Abstract**

Revision of an intrapelvic migration of the acetabular component of a total hip is a challenging surgery due to the risk of injury to the pelvic viscera. The primary concern is vascular injury due to the risk of mortality and limb loss. The researchers present one case where the acetabular screw was near the posterior branch of the internal iliac artery. A Fogarty catheter was placed in the internal iliac artery preoperatively, and the amount of fluid to inflate the catheter and completely block the artery was determined. The catheter was kept in a deflated condition. The hip reconstruction was performed, and there was no incidence of vascular injury during the procedure; hence, the Fogarty catheter was removed postsurgery. The placement of a Fogarty catheter in the at-risk vessel provides the freedom to proceed with the hip reconstruction through the standard approach. In case of an inadvertent event of a vascular injury, it can be inflated with the predetermined amount of saline to check the bleeding until the vascular surgeons take over the case.

**Level of evidence:** V

**Keywords:** Complex hip revision, Intra-pelvic migration, Fogarty, Vascular injury

**Introduction**

The intrapelvic migration of the acetabular component is a rare but challenging condition for orthopedic surgeons. The revision surgery becomes demanding due to the risk of injury to the neurovascular structures, the bowel, and the pelvic viscera while removing the failed components and performing hip reconstruction. Of these, the primary importance is always given to vascular injury as there is a risk of mortality and limb loss. Ours is a high-volume arthroplasty center with several challenging cases being referred. We have routinely performed CT Angiography

of the pelvis and lower limbs in all these patients to see the position of neurovascular structures concerning the migrated component. Most of them underwent successful revision surgery as the vessels were free from the failed components. Here, we discuss a case of intrapelvic migration of the acetabular component where the screw was lying in proximity to the internal iliac vessels and our innovative approach to mitigate the risk.

**Technical note**

A 46-year-old female, a case of idiopathic osteonecrosis

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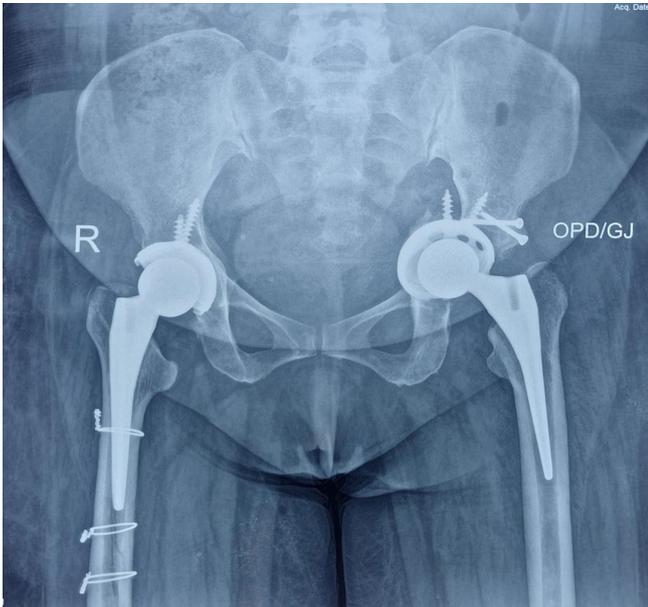


Figure 1. A radiograph of the pelvis with both hips in anteroposterior view shows failed Total hip arthroplasty (THA) on the left side. Note the intrapelvic migration of the acetabular component along with the screws.

of the bilateral femoral head who had undergone bilateral total hip replacement elsewhere, presented in the seventh month postoperative period with an intrapelvic migration of the acetabular component on the left side [Figure 1]. A CT scan of the pelvis revealed discontinuity of the anterior wall of the acetabulum

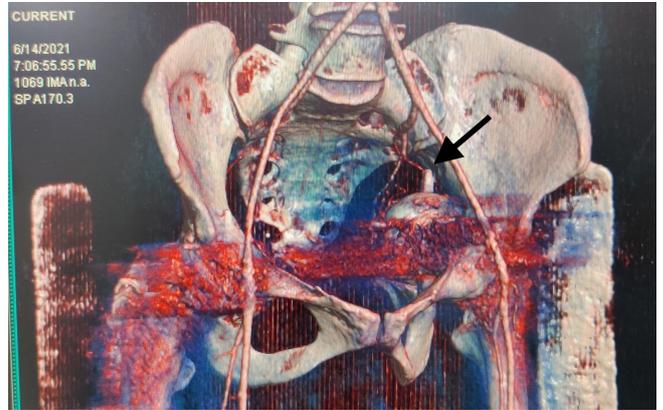


Figure 2. Angiograph shows the proximity of the left internal iliac vessel and its branches screw migrated along with the failed acetabular component.

and loss of the quadrilateral plate. A CT angiography revealed the proximity of a screw to the posterior division of the internal iliac artery [Figure 2]. A revision hip reconstruction surgery was planned, and a call was given to the vascular surgeon, gastrointestinal surgeon, and urology surgeon as a backup in case of injury to any abdominal viscera. The interventional radiology team performed a preoperative insertion of a Fogarty catheter in the left internal iliac artery. The balloon was deflated after the check inflation with 6 ml fluid and left in situ [Figure 3A; B]. This was taken as a precautionary measure to stop exsanguinating bleeding in case of an accidental vascular injury.

The patient was taken to the operating room, and



3A



3B

Figure 3 A. Angiography shows an inflated Fogarty catheter in the internal iliac artery to secure branches.

Figure 3 B. Angiography shows the Fogarty catheter in the deflated stage.

the standard postero-lateral approach was used. Once the hip was dislocated, the polyethylene liner was removed by drilling a hole and inserting a cortical screw through the liner. The cup was removed sequentially by eliminating the screws, followed by careful extraction of the cup. Fortunately, the screws could be removed uneventfully. Acetabular reconstruction was done by filling the medial defect with allograft followed by placement of the Trabecular Metal Revision System. The femoral stem in situ was found intact and hence retained. The Fogarty catheter was removed after ensuring that the distal vascularity was intact. The patient was allowed progressive weight bearing for three months, and she is doing well at the latest follow-up.

### Discussion

Intrapelvic migration of a failed acetabular component might be due to chronic infections, massive osteolysis, poor bone quality, malposition of the cup, or an improper surgical technique.<sup>1,2</sup> Such a complication needs a backup of either one or more surgical subspecialty teams. These cases require a thorough preoperative evaluation to determine the component's position concerning the intrapelvic structures. The most feared complication is a vascular injury because it may lead to mortality or a loss of the extremity later on.<sup>3</sup> The migrated prosthesis near the vessels and lack of dedicated preoperative workup may lead to undesirable consequences intraoperatively.

Most of the literature on such complications has discussed alternative approaches for the safe removal of the acetabular component rather than any specific technique to overcome any imminent complication. There have been reports of surgeons describing the use of sub-peritoneal and trans-abdominal approaches in such cases in the early 90s.<sup>4-6</sup> The surgeons then preferred to perform the revision in multiple stages rather than a single stage. With the introduction of trabecular metal shells and cages, which favor osteosynthesis by sharing the load, surgeons performed complex, non-infective revisions in a single-stage.<sup>7</sup> Foster et al. used a retroperitoneal approach for cup extraction along with the repair of injured iliac vessels and sequentially a traditional posterior approach of the hip for reconstruction.<sup>8</sup>

Similarly, Stiehl described an extensive triradiate lateral approach with an ilioinguinal extension. The researchers also showed a case where the migrated component was

left in situ, and reconstruction was done over it since the infection was ruled out.<sup>1</sup> More recently, Francisco et al. extracted one such intrapelvic migrated cup using a Stoppa approach followed by reconstruction in the same stage by the traditional hip approach.<sup>9</sup> Ahmad et al. reported a similar complex revision through a single posterior hip incision. The researchers disengaged the migrated component by closed traction and manipulation with the assistance of a vascular surgeon. The researchers could gradually reduce the migrated cup and perform the revision. Although there was no evidence of bleeding instantly, it does not guarantee the same result in the cases.<sup>10</sup> Here, we could remove the component via a posterior approach using the same incision used in the past. Had there been any accidental vascular injury, the plan was to inflate the Fogarty balloon to prevent exsanguinating hemorrhage and change in position of the patient for vascular reconstruction, which fortunately was not required in this case.

The researchers recommend preoperative placement of Fogarty catheter in the vessels at risk based on the radiological evaluation and go ahead with performing the revision using the traditional hip approach. In an inadvertent event of a vascular injury, the acute blood loss can be controlled by inflating the Fogarty catheter until the vascular surgeons take over the case and salvage the situation.

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

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