Mitigation of Vascular Complications in Revision Total Hip Arthroplasty with Intrapelvic Migration of Implants: A Preoperative Algorithmic Approach

Vijay Kumar, Apoorva Praveen Kabra[1], ABHIJIT BEHERA, Mukund Madhav Ojha, Vivek Shankar
[1]Orthopaedics

INTRODUCTION: Intra-pelvic migration of implants or cement during total hip arthroplasty (THA) is a rare but serious complication that can lead to life-threatening vascular injuries during revision surgery. The close proximity of migrated components to major pelvic vessels significantly increases the risk of intraoperative hemorrhage, necessitating a strategic preoperative and intraoperative approach.

METHODS: This retrospective study evaluated 37 patients undergoing revision THA for intra-pelvic implant or cement migration at a tertiary care center between 2020 and 2024. All patients underwent preoperative computed tomography angiography (CTA) to assess vascular proximity. Patients with implants or cement within 5 mm of pelvic vessels underwent preoperative endovascular intervention—either balloon catheter placement (n=9) for larger vessels or arterial coiling (n=6) for smaller branches. Intraoperative and postoperative outcomes, including vascular injury, blood loss, transfusion needs, and complications, were assessed.

RESULTS: Vascular proximity was identified in 15 (40.5%) patients. Endovascular interventions were successfully performed without perioperative complications. One patient required balloon inflation intraoperatively to control bleeding, with no subsequent hemodynamic instability or mortality. No major vascular injuries or emergency conversions occurred. At one-year follow-up, no implant re-migration or patient deaths were reported. Functional outcomes significantly improved, with the mean Harris Hip Score rising from 32.0 ± 10.5 preoperatively to 78.7 ± 11.7 postoperatively.

DISCUSSION AND CONCLUSION: A preoperative algorithm incorporating CTA and selective endovascular intervention effectively mitigates vascular risks in revision THA with intra-pelvic migration. Balloon catheter placement and arterial coiling offer targeted vascular protection, enabling safer surgical execution. This multidisciplinary, algorithmic strategy enhances patient safety and surgical outcomes in complex revision hip arthroplasty. Further prospective studies are warranted to validate and standardize this approach.