

## Combined Pelvic Ring and Acetabular Fractures: Treatment, Complications, and Outcomes

*Will Robert Kitchen BA; Rachael Clegg MBChB; Hussein Taki MBChB; Elizabeth Shirland RN; Jaikirty Rawal FRCS (Ortho); Peter Hull FRCS (Ortho); Andrew Douglas Carrothers FRCS (Ortho); Daud Chou FRCS (Ortho)*

Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

**Purpose:** Combined pelvic ring and acetabular fractures are rare injuries, often associated with high-energy mechanisms, high ISS, and significant mortality. While there is growing literature on the management and outcomes for isolated pelvic ring or acetabular injuries, there are little equivalent data regarding combined fractures. We aim to describe the management, complications, and outcomes of these injuries.

**Methods:** A prospective pelvic and acetabular database of the regional Level-I major trauma center (MTC) was interrogated to retrospectively identify all patients with a combined pelvic ring and acetabular fracture over a 4-year period between August 2015 and August 2019. Fractures were classified according to the Young and Burgess (pelvic ring) and Letournel (acetabular) fracture classification systems. Medical records were reviewed for demographics, mechanism of injury, other injuries, initial level of ward care, comorbidities, nature of treatment, and complications. Patient questionnaires included the EQ-5D-5L (EuroQol 5-Dimensions 5-Level), Oxford Hip Score (OHS), International Hip Outcome Tool (iHOT-12), Majeed Pelvic Score, and a urinary dysfunction survey.

**Results:** Of the 914 patients referred to the MTC with pelvic or acetabular fractures during the study period, 43 (4.7%) were identified as having both pelvic ring and acetabular fractures. Two had bilateral acetabular fractures. 32 were male and 11 female. Mean age was 46.3 years (range, 17-94) and mean body mass index (BMI) 27.3 kg/m<sup>2</sup> (range, 18-52). Mechanisms were largely high energy, with 25 patients (58.1%) being involved in a road traffic collision and 12 (27.9%) a fall from height. The most common combination was a lateral compression 1 pelvic fracture with an anterior column acetabular fracture, sustained by 15 patients (34.9%). 23 patients (53.5%) were managed conservatively. 10 (23.3%) underwent both pelvic and acetabular fixation while 4 (9.3%) had acetabular and 6 (14.0%) pelvic fixation alone. Of those managed surgically, mean time to first definitive pelvic or acetabular surgery was 6.4 days. 7 patients (16.3%) developed postoperative complications: 5 developed sepsis, 2 a pulmonary embolism, and 1 nonunion. The median follow-up time was 20 months (range, 4-41). Median OHS at latest follow-up was 36, Majeed Score 81.1, and iHOT-12 67.6. Three patients reported ongoing urinary/sexual dysfunction and there was 1 death at 11 months post-injury.

**Conclusion:** Combined pelvic and acetabular fractures are a significant injury with life-changing sequelae. Restoring anatomical joint alignment of the acetabulum must be balanced with achieving pelvic fixation to provide structural and physiological stability. Given the high morbidity involved, initial resuscitation, stabilization, surgical fixation, and eventual outcomes must be carefully considered when managing such patients.