

Hemorrhage Control and Transfusion Requirements of Pelvic Ring Fractures Attending a Major Trauma Center for Emergency and Definitive Care: Does Early Aggressive Resuscitation Influence Mortality at 1 Year?

James Bassett, MBBS¹; David Slattery, MBBS¹; Greg Pickering, MBBS¹; Anthony Ward, MBBS¹; Mehoor R. Acharya; Tim Chesser, MBBS²

¹North Bristol NHS Trust, Emersons Green, Bristol, UNITED KINGDOM

²Southmead Hospital, North Bristol NHS Trust, Bristol, UNITED KINGDOM

Purpose: Pelvic ring injuries are associated with significant hemorrhage. There have been substantial improvements in trauma management and treatment of major hemorrhage in recent years. Patients are now receiving pelvic binder application on scene with a systematic approach to resuscitation, including tranexamic acid. The aim of this study was to review the mortality and blood transfusion requirements of all surgically treated pelvic ring disruptions from one major trauma center over a 3-year period, to assess the impact of this protocol.

Methods: All patients transferred to a major trauma center suffering pelvic ring or combined pelvic ring and acetabular injuries, following blunt trauma, from 2013 to 2015 inclusive were retrospectively assessed. Mortality, blood and blood product requirements, and hemorrhage control treatments (angiographic embolization and pelvic packing) were reviewed.

Results: 257 patients underwent surgery for pelvic and acetabular fractures during the study period. 132 patients had pelvic ring fixation. Data were complete for all patients. Unstable pelvic ring injuries have higher transfusion requirements, with anterior posterior compression (APC) 3 needing the highest mean volume of transfusion (10.7 units). The 30-day and 1-year mortality was 5%, transfusion was required in 40%, and only the more severe fractures (APC 3, lateral compression [LC] 3, and combined pelvic and acetabular injuries) had a mean transfusion greater than 4 units. 15% of patients were treated with massive hemorrhage protocol with a mean transfusion of 15.7 units. 6% (8 patients) had emergency application of an external fixator and all but one of these also had pelvic packing. Six patients had angiographic embolization, three of these after initial external fixator and pelvic packing.

Conclusion: Recent changes in trauma management have led to a reduction in mortality compared with historical literature. APC 3 fractures remain the most vulnerable group of patients with other unstable fracture patterns also requiring significant transfusions. 11% of patients with unstable pelvic ring injuries have either an external fixator and pelvic packing or angiographic embolization as part of their initial resuscitation.