Mortality and Complications After Preperitoneal Pelvic Packing and Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) in Patients with Pelvic Ring Injuries

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Purpose: The purpose of this study was to compare the mortality and complication rates of patients treated under a preperitoneal pelvic packing (PPP) protocol, with and without zone 3 resuscitative endovascular balloon occlusion of the aorta (REBOA).

Methods: A retrospective review identified 115 severely injured patients (ISS>15) who received PPP for pelvic ring injuries with persistent hemodynamic instability (HDI). Exclusion criteria included patients who received PPP at an outside hospital or who did not have an associated pelvic ring injury, patients who required resuscitative thoracotomy or cardiopulmonary resuscitate on arrival, and patients who received zone 1/2 REBOA placement. These exclusions were made to isolate the effect of zone 3 REBOA placement in the setting of PPP. Primary outcomes included 30-day in-hospital mortality and complications. Patients who did and did not receive REBOA were compared in terms of demographics, clinical characteristics, laboratory results, mortality, and complications. Univariate and multivariate analysis was performed to investigate potential independent variables associated with mortality across the entire cohort. Propensity score matching was performed 1:1 across groups to account for differences between groups on univariate analysis: these included ISS, admission systolic blood pressure, lactate, blood products in first 8 hours, Tile C classification, and laparotomy. Nearest neighbor matching was used to identify the post-match cohort utilizing a caliper width of 0.2.

Results: Zone 3 REBOA was utilized in 34 of 115 patients (29.6%). Propensity score matching resulted in 25 patients from each group for comparison. The PPP+REBOA group had a higher transfusion requirement (observed difference [OD] 1879 mL, confidence interval [CI] 489 to 3723; P = 0.008) and acute kidney injury rate (OD 32.0%, CI 4.3 to 54.9%; P = 0.04). There was no observed difference in mortality rates or other complications. On multivariate analysis, the only variables that remained associated with 30-day mortality were age (odds ratio [OR] 1.05 per unit increase, CI 1.01 to 1.10; P = 0.01) and Glasgow Coma Scale (OR 0.82 per unit increase, CI 0.70 to 0.95; P = 0.002). REBOA insertion site complications occurred in 13.0% (6 of 47) resulting in a reoperation rate of 8.5% (4 of 47).

Conclusion: Patients treated under a multidisciplinary protocol that utilizes PPP and REBOA frequently expire from the severity of their injuries but not from uncontrolled hemorrhage. Patients treated with REBOA had a similar mortality rate despite presenting in more profound shock.