SWSC 2020 On-Demand Meeting Abstracts

1. DELAYS IN SURGICAL INTERVENTION AND TEMPORARY HEMOSTASIS USING RESUSCITATIVE ENDOVASCULAR BALLOON OCCLUSION OF THE AORTA (REBOA): INFLUENCE OF TIME TO OPERATING ROOM ON MORTALITY

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Background: Resuscitative endovascular balloon occlusion of the aorta (REBOA) is a technique for temporary control of arterial hemorrhage. While various studies have reported conflicting results on REBOA use, the optimal candidates for REBOA remain unclear. As REBOA is designed to temporize hemorrhage until definitive surgical control is achieved, we hypothesized that patients who experience delays in surgical intervention after injury would benefit from REBOA compared to those who do not.

Methods: We conducted a retrospective cohort study using the Japan Trauma Data Bank (2014-2019), a nationwide database which includes over 200 major tertiary care centers. We included adult trauma patients who were transferred to the operating room (OR) within 3 hours of arrival and were transfused within 24 hours. Patients who underwent REBOA placement (REBOA group) were matched with a similar cohort of patients (non-REBOA group) using propensity scores calculated using age, injury variables, vital signs, presence of intraabdominal hemorrhage, Abbreviated Injury Scale, and Injury Severity Score (ISS). Matched groups were further divided into three subgroups based on the transfer time to OR after hospital arrival: within 1 hour (early), 1 to 2 hours (delayed), and greater than 2 hours (significantly-delayed). Survival to discharge was then compared between the two groups, and the hazard ratio (HR) for mortality was calculated in each subgroup.

Results: Of 187,059 trauma patients, 5,422 met all inclusion criteria and 164 were excluded due to missing survival data. A total of 5,258 patients were eligible for this study, among whom 310 were treated with REBOA. After propensity score matching, 223 pairs of severely injured patients (mean ISS 35; mean Revised Trauma Score 5.54) were selected from both groups. Survival to discharge was significantly higher among patients treated with REBOA than among those treated without REBOA (126 [56.5%] vs. 71 [31.8%]; odds ratio [OR] = 2.78; 95% confidence interval [CI] = 1.89–4.09; $p < 0.01$). Median time to OR was comparable between the two groups (1.4 hours in the REBOA group vs 1.3 hours in the non-REBOA group), and 143, 191, and 112 patients were allocated to the early, delayed, and significantly-delayed subgroups. REBOA use was significantly associated with reduced in-hospital mortality in the delayed and significantly-delayed subgroups (HR = 0.43 [0.28–0.65] and 0.42 [0.25–0.71], respectively). There was no mortality difference in the early subgroup (HR = 0.92 [0.60–1.40]).

Conclusion: In severely injured patients, the use of REBOA was associated with improved survival. Patients who experienced delays in transfer to the OR greater than one hour after arrival received benefits from REBOA, whereas those who underwent surgical intervention without delay did not. Use of REBOA should therefore be considered in severely injured patients when preoperative delays or prolonged OR wait times are expected.

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