

## NATIONWIDE ANALYSIS OF RESUSCITATIVE ENDOVASCULAR BALLOON OCCLUSION OF THE AORTA (REBOA) IN CIVILIAN TRAUMA.

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**Introduction:** The need for improved methods of hemorrhage control and resuscitation along with the translation of endovascular specialty skills has resulted in reappraisal of resuscitative endovascular balloon occlusion of the aorta (REBOA). The aim of our study was to evaluate the outcomes in trauma patients after REBOA placement. We hypothesized that REBOA is associated with improved survival.

**Methods:** We performed a 2-year (2015-2016) review of TQIP and identified trauma patients who underwent REBOA placement and matched them with a similar cohort of patients (No-REBOA). Both groups were matched in a 1:2 ratio using propensity score matching for demographics, vitals (prehospital and ED SBP, HR, GCS), mechanism of injury, ISS, h-AIS, c-AIS, Pelvic fractures (intact, incompletely disrupted and completely disrupted pelvic ring), lower extremity vascular injuries and fractures, number and grades of intra-abdominal solid organ injured (liver, splenic, kidney injuries). Outcomes were rates of complications and mortality.

**Results:** Of the 593818 trauma patients, 420 patients (REBOA: 140; No-REBOA: 280) were matched. Mean age was  $44 \pm 20$  years, ISS was 29 [18-39], 74% were males and 92% patients had blunt mechanism of injury. Overall rate of complications and mortality were 7.4% and 24.5% respectively. There was no difference in 4-hours or 24-hours blood transfusion, and hospital or ICU length of stay as shown in Table 1. Mortality rate was higher in the REBOA Group as compared to the No-REBOA group (36% vs 19%,  $p=0.01$ ). Patients who underwent REBOA placement were also more likely to develop AKI (10.7% vs 3.2%,  $p=0.02$ ) and more likely to undergo lower extremity amputation (4.5% vs 0.7%,  $p=0.04$ ). On sub-analysis using logistic regression based on SBP, REBOA was associated with worse mortality in patients with SBP 80-110 group (OR: 4.67[1.35-15.42],  $p=0.03$ ) or in the SBP<80 group (OR: 2.51[1.16-14.41],  $p=0.03$ ).

**Conclusion:** In a matched cohort of severely injured patients REBOA placement as compared to standard therapy was associated with higher rates of complications and mortality. Further clinical trials are required to define the trauma patients that may benefit from REBOA.

Table 1. Outcomes

Variables	REBOA (n=140)	No REBOA (n=280)	P-value
<b>4-Hours Transfusion</b>			
pRBC, units, median[IQR]	6[3-8]	7 [3-9]	0.14
Platelets, units median[IQR]	4 [3-9]	4 [3-8]	0.13
Plasma, units, median[IQR]	3[2-5]	3 [2-6]	0.17
<b>24-Hours Transfusion</b>			
pRBC, units, median[IQR]	9 [5-20]	10 [4-21]	0.21
Platelets, units median[IQR]	7 [3-13]	8 [3-12]	0.12
Plasma, units, median[IQR]	9 [6-20]	10 [7-20]	0.11
Hospital-LOS, d, median[IQR]	10 [1-20]	10 [5-22]	0.21
ICU-LOS, d, median[IQR]	5 [2-14]	6 [3-15]	0.19
<b>Complications, % (n)</b>			
AKI	10.7% (15)	3.2% (9)	0.02
Amputation of lower limb	4.5% (5)	0.7% (2)	0.04
<b>Overall mortality, % (n)</b>			
ED mortality	2.9% (4)	1.8% (5)	0.35
24-Hours mortality	26% (37)	12% (33)	0.01
After 24-Hospital mortality	7.1% (9)	5.2% (15)	0.21

pRBC = Packed Red blood cells, LOS = Length of stay, ICU = Intensive care unit,  
AKI = Acute kidney injury, SD = Standard deviation, IQR = Interquartile range