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Trauma

REBOA for trauma: Could we? Should we?

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In 1954, Hughes et al[1] published the first report of using intra-aortic balloon occlusion during the Korean War. Although this initial report included only 2 patients, both of whom subsequently died, this publication launched a now decades-long quest to refine this technique. Over time, this idea has been rechristened resuscitative endovascular balloon occlusion of the aorta (REBOA) and has been studied in a multitude of settings on a wide variety of patients. Despite being widely studied, we still struggle to answer fundamental questions regarding practicality and efficacy raising the questions of "could we?" and "should we?" In this *JACEP Open* podcast, we discuss this month's article by Yamamoto et al[2] looking at the use of REBOA for blunt traumatic arrests in Japan.

1 | COULD WE?

From a practical standpoint, the application of REBOA remains problematic. As done by Yamamoto et al, REBOA is often compared to resuscitative thoracotomy with aortic cross clamping. Although both techniques occlude the aorta, previous studies have shown that using REBOA may have some significant technical limitations. When compared to a thoracotomy, Romagnoli et al[3] found in REBOA patients it took >2 additional minutes to occlude the aorta, a delay that could be crucial in a crashing patient. In a retrospective review of data from a level 1 trauma center, Theodorou et al[4] found that ~44% of REBOA patients developed significant post-procedural complications.

2 | SHOULD WE?

In terms of efficacy, the available data are messy and at times contradictory. When compared with similarly injured trauma patients, Joseph et al[5] found that patients who underwent REBOA had higher rates of mortality, acute kidney injury, and subsequent lower extremity amputation. This may be a somewhat imperfect comparison as it would make sense that patients who needed an invasive procedure could have increased rates of adverse events. A more appropriate comparison would be to compare outcomes between REBOA and thoracotomy. In a prospective analysis comparing REBOA to thoracotomy, Dubose et al[6] found a trend toward improved hemodynamics in patients who underwent REBOA, but found no significant difference in mortality.

Yamamoto et al reported that patients who underwent REBOA had higher rates of survival compared with those who underwent a thoracotomy (3.5% vs 0.7%). The authors also found that REBOA performed poorly when placed outside of what they considered high-volume trauma centers, suggesting that there are some significant technical limitations that are not fully understood. When Hughes initially reported his Korean War case series, an explanation was offered that in more experienced hands and applied earlier or to less sick patients the outcomes may be different. Although the data from the study by Yamamoto et al are interesting and should be hypothesis generating, still 70 years since REBOA first appeared these questions of practicality and efficacy still remain.

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