


Utilization of REBOA for pediatric trauma patients: barriers to adoption

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The utilization of resuscitative endovascular balloon occlusion of the aorta (REBOA) in pediatric trauma is exceedingly rare and efforts to determine efficacy have been difficult as a result. The paper presented here by Kuo *et al* uses the ACS-TQIP database along with a case match controls to evaluate outcomes with and without REBOA.¹

In our view as pediatric surgeons, there are several barriers to adoption of the REBOA as a tool in the care of severely injured trauma patients in children's hospitals. One of the main barriers is a lack of evidence that REBOA is an effective treatment in pediatric patients. As noted by the authors, the mortality rate is higher in the REBOA group within this study despite case matching, although not to a statistically significant degree. Additionally, the study showed an increased amount of blood transfused in the initial hours of resuscitation in patients receiving treatment with a REBOA. This may be related to the increased mortality found in the study, as large volume transfusions are associated with higher rates of complication in pediatric trauma patients.² Interestingly, the adult trauma literature has mixed results with REBOA use, with some showing similar unfavorable outcomes.³ The combination of these findings will likely not encourage children's hospitals to expend the time and resources necessary to trial the use of REBOA for their trauma patients.

The second point that presents a barrier in the adoption of REBOA at children's hospitals is the small number of appropriate patients for treatment, even at the largest pediatric trauma centers. Related to this small number of patients, there are very few providers in children's hospitals currently that will be comfortable with effective and timely REBOA placement, and in determining appropriate candidates for this intervention. This paucity of skilled providers could potentially be overcome if REBOA placement became the standard of care at children's hospitals nationwide, although the number of pediatric trauma patients that would qualify for this procedure would likely remain exceedingly small. Again, similar issues appear to be present in adult trauma centers when examining the literature, despite higher trauma volumes.^{4,5}

Third, there are no devices currently in use that are intended for use in pediatric patients. As the authors highlight, there is a 4-French access sheath available, which is size appropriate for many pediatric patients. However, the balloon and the device likely have not been designed or tested on pediatric patients, and therefore, the results of its use may

be suboptimal. The use of adult devices for pediatric patients in off-label scenarios is common at children's hospitals, but this can lead to improper utilization of these devices in some cases.

The authors' efforts to evaluate the use of REBOA in pediatric patients is commendable and adds to a small but growing body of literature on the subject. Utilization of REBOA in adult-sized pediatric trauma patients could be appropriate in some cases but is unlikely to be adopted at most children's hospitals due to the factors outlined above. Expansion of the use of REBOA in younger and smaller patients is unlikely to gain traction given the lack of appropriately sized devices and appropriate data to support its use.

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