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Perspective

Feasibility of REBOA Use by Emergency Physicians in Refractory Non-Traumatic Cardiac Arrest

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DESCRIPTION

Cardiac arrest affects over 600,000 individuals annually in the United States, with an alarmingly low survival rate of 8%-12%. Despite advances in Cardiopulmonary Resuscitation (CPR) and Advanced Cardiac Life Support (ACLS), the prognosis for patients remains poor. Extracorporeal Cardiopulmonary Resuscitation (ECPR) has emerged as a prospective intervention, offering potential survival benefits over standard resuscitation methods. However, the high cost, technical complexity and the limited availability of Extra Corporeal Membrane Oxygenation (ECMO) teams pose significant barriers to its widespread adoption. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA), initially developed for managing severe hemorrhagic shock, has shown potential in treating refractory cardiac arrest by enhancing coronary and cerebral perfusion, according to animal studies, case reports and a recent feasibility trial. REBOA is technically simpler to deploy than ECPR and has demonstrated the ability to achieve Return of Spontaneous Circulation (ROSC) in approximately 50% of patients with refractory cardiac arrest. Although successful REBOA deployment in the Emergency Department (ED) by emergency medicine physicians has been shown to be feasible, evidence supporting its routine use in the U.S. ED setting is limited. As with other infrequent, high-risk procedures that may offer life-saving potential in otherwise fatal cases, it is important for providers to maintain expertise and confidence in performing REBOA. A 2019 literature review highlighted the lack of trained physicians as a key obstacle to its broader implementation and suggested that simulation-based training could help address this gap. In response, the goal was to train a cohort of emergency medicine physicians in REBOA catheter placement and to demonstrate the feasibility of an ED-driven protocol for its use in refractory cardiac arrest cases. A complete REBOA training program was developed, incorporating a literature review, didactic lectures, hands-on simulation and objective competency assessments. Ongoing training and assessment were required for certification in clinical REBOA placement and for skill maintenance. In this case series, a describe protocol for deploying REBOA in the ED for refractory cardiac arrest. The step-by-step process of REBOA placement is outlined, covering patient selection, catheter insertion and the use of Transesophageal Echocardiography (TEE) to guide the procedure. TEE is utilized to confirm catheter placement and assess cardiac function, ensuring optimal perfusion during the procedure. Additionally, detail about balloon deflation strategy, which is an important component of the resuscitation process to avoid potential complications such as reperfusion injury or limb ischemia. The protocol is designed to be straightforward, facilitating rapid deployment by emergency medicine physicians with appropriate training. This case series also highlights the importance of extensive procedural training, including hands-on simulation and ongoing competency assessments, to ensure the safe and effective use of REBOA in refractory cardiac arrest. By sharing the experience, the goal is to evaluate the feasibility of incorporating REBOA into standard ED practice for High-risk cases that otherwise have no viable rehabilitation options.

CONCLUSION

In conclusion, the study demonstrates that REBOA can be successfully deployed by emergency physicians in the ED for non-traumatic refractory cardiac arrest. Although there are notable challenges and limitations to implementing such a program with appropriate training, institutional support and resources, REBOA has the potential to become a valuable tool in the resuscitation of patients with refractory cardiac arrest, both in academic centers and other healthcare settings. Future study should focus on optimizing the timing of REBOA deployment, refining training and skills maintenance strategies and identifying the most effective clinical environments for its use to fully realize its potential.

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