



<https://doi.org/10.1016/j.jemermed.2018.01.005>

Original Contributions

SUCCESSFUL INTERPROFESSIONAL APPROACH TO DEVELOPMENT OF A RESUSCITATIVE ENDOVASCULAR BALLOON OCCLUSION OF THE AORTA PROGRAM AT A COMMUNITY TRAUMA CENTER

Zaffer Qasim, MBBS, FRCEM, FRCP(C), EDIC,* Kevin Bradley, MD, FACS,†
 Heather Panichelli, AGCNS-BC, MSN, RN, CEN, CPEN,* Josie Robinson, RN, CEN,* and
 Susan Coffey Zern, MD, MSMS, CHSE‡

*Department of Emergency Medicine, Christiana Care Health System, Newark, Delaware, †Division of Trauma Surgery, Department of Surgery, Christiana Care Health System, Newark, Delaware, and ‡Virtual Education and Simulation Training Center, Christiana Care Health System, Newark, Delaware

Reprint Address: Zaffer Qasim, MBBS, FRCEM, FRCP(C), EDIC, Department of Emergency Medicine, University of Pennsylvania School of Medicine, Ground Floor Ravdin, 3400 Spruce Street, Philadelphia, PA 19104

□ **Abstract—Background:** Resuscitative endovascular balloon occlusion of the aorta (REBOA) is a relatively innovative procedure designed to control critical non-compressible torso hemorrhage. In the United States, this procedure is currently in active use at only a small number of trauma centers. **Objective:** We describe how we developed our REBOA program at an independent academic-affiliated community trauma center. **Discussion:** Through a close interprofessional and multidisciplinary collaboration led by emergency physicians and trauma surgeons, we were able to successfully develop our program. **Conclusions:** Successful implementation of a REBOA program requires close attention to multimodal training, interprofessional roles, team dynamics, financial considerations, and quality assurance processes to safely deliver this potentially life-saving procedure to our trauma patient population. © 2018 Elsevier Inc. All rights reserved.

□ **Keywords—trauma; hemorrhage; REBOA**

INTRODUCTION

Resuscitative endovascular balloon occlusion of the aorta (REBOA), a relatively new endovascular procedure, presents an alternative management option to thoracotomy and aortic cross-clamping for non-compressible

torso hemorrhage (NCTH) (1,2). NCTH is a significant cause of early mortality after injury. Suggested indications and contraindications for use of REBOA are listed in Table 1.

In the United States, REBOA has largely been developed and deployed in academic university teaching hospitals. However, its use should not be confined to such institutions. We describe how we successfully and safely instituted this technique through an interprofessional effort at an independent academic-affiliated community Level I trauma center.

DISCUSSION

Setting

Christiana Care Health System comprises two hospitals (Christiana Hospital and Wilmington Hospital), and a freestanding emergency department (ED) (Middletown Emergency Department) in Delaware. Christiana Hospital is a 913-bed facility within that system and serves as the only Level I trauma center for the state.

Christiana Care Health System is an independent academic-affiliated community medical center. Christiana Care Health System operates independently of

Table 1. Indications and Contraindications for Resuscitative Endovascular Balloon Occlusion of the Aorta

Indications	Contraindications
Patients with noncompressible torso hemorrhage who: Are refractory to standard damage control resuscitation, i.e., transient or nonresponders Have a witnessed traumatic arrest solely ascribed to their torso hemorrhage	Critical major bleeding above the diaphragm including: Aortic dissection Pericardial tamponade Massive hemothorax Vascular neck injury Junctional vascular injury in the axilla

university medical school ownership or governance, while maintaining an affiliation with the Sidney Kimmel Medical College of Thomas Jefferson University in Philadelphia, Pennsylvania. Christiana Care Health System hosts 14 medical residency training programs including emergency medicine (EM) and general surgery. The EDs see > 100,000 patients per year.

The trauma program at Christiana Hospital sees approximately 4500 trauma activations per year, primarily with blunt traumatic injuries, and we developed our REBOA program at this site.

Identifying the Viability for REBOA in Your System

The evidence for REBOA appears to be promising. Its implementation involves a large investment of time and resources, and its need within an individual system must be identified.

To identify this need, we reviewed Christiana Hospital's trauma registry over the year before starting our REBOA program using these criteria: injuries compatible with subdiaphragmatic torso hemorrhage (blunt or penetrating); hypotension on hospital arrival; and transient or nonresponse to standard initial damage-control resuscitation. We found that we had up to 2 patients per month who could potentially benefit from REBOA and would support us developing a REBOA program.

We recommend that an individual center should review their patient case-mix and volume, the immediate availability of trained personnel skilled in the safe deployment of REBOA, and the ability to transport the patient expediently to definitive care to achieve hemorrhage control, ideally within less than 1 h of balloon deployment and inflation (3).

Working Group Formation

At our institution, a working group of representatives from EM, trauma surgery, emergency and trauma nursing, and vascular surgery, was created at the start of the REBOA project. The group was led by a dual-

trained EM/critical care medicine physician who was the physician champion. With program development, additional collaboration was sought from the hospital's simulation department, anesthesiology, and interventional radiology.

We recommend an interprofessional, multidisciplinary approach to developing a REBOA program to ensure safety and optimal patient outcomes led by a physician champion able to coordinate all efforts.

Training

Appropriate training is critical to ensure patient safety. We completed this in two steps.

First, the proceduralist obtained skills training at a nationally recognized course. Several such courses exist, including the American College of Surgeons Committee on Trauma—approved Basic Endovascular Skills for Trauma (BEST) course, the Endovascular Skills for Trauma and Resuscitative Surgery course and the Center for Advanced Learning and Simulation REBOA course (4–6). At Christiana Care Health System, all of the proceduralists who would perform REBOA were mandated to attend the BEST course.

Second, proceduralists and team members underwent hospital-specific training in our Virtual Education and Simulation Training (VEST) center. A curriculum was developed following Kern's six-step approach (7). High fidelity was required for a complex procedure like REBOA. We therefore created a novel task trainer and manikin. The manikin was designed so that the evaluator could assess the position and adequacy of balloon inflation. The simulation curriculum was piloted, allowing the education team to identify important process changes that had not been considered previously, including critical issues, such as design of the procedure kit, position of the procedure table, and refinement of communication and documentation. These suggestions were incorporated into the training, subsequent clinical implementation, and the associated checklist. The checklist, including critical decision points and technical skills, allowed all individuals already trained in the procedure to be signed off for consistent, uniform REBOA delivery within our trauma system.

We recommend considering a similar two-step training approach and inclusion of interprofessional simulation practice specific to your hospital's setup to allow identification of process issues and seamless rollout of a REBOA program.

Interprofessional Involvement and Roles

All members of our interprofessional team, including physicians and nurses from the ED, trauma surgery,

Download English Version:

<https://daneshyari.com/en/article/8719511>

Download Persian Version:

<https://daneshyari.com/article/8719511>

[Daneshyari.com](https://daneshyari.com)