NYC HEALTH+ HOSPITALS | Jacobi

From Times Square to the Bronx: How We Implemented a City-Wide REBOA Program.

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- No disclosures

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Non Compressible Torso Hemorrhage

- NCTH is the leading cause of potentially survivable trauma.
- Hispanics are disproportionately affected as compared to other ethnicities.
- Techniques to temporize and control NCTH before definite therapy have become an important clinical research topic.

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REBOA = Resuscitative Endovascular Balloon Occlusion of the Aorta

- REBOA
  - Internal Aortic Cross Clamping
  - A balloon is placed in the aorta, in order to interrupt distal blood flow.

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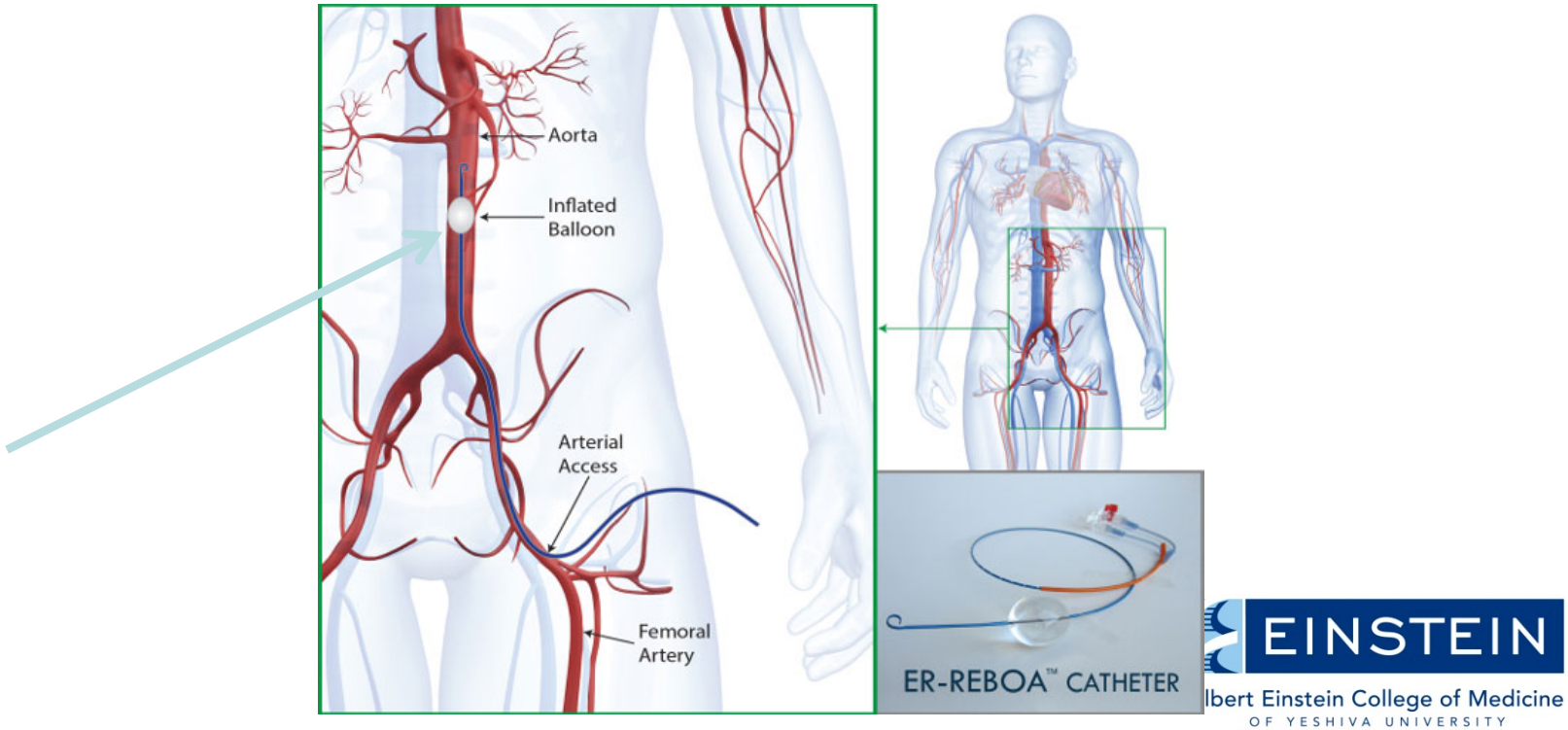
REBOA=
Resuscitative Endovascular Balloon Occlusion of the Aorta



- The goal of REBOA is to provide control of hemorrhage in patients with intra-abdominal or pelvic exsanguinating injuries.
  - Minimize Hemorrhage
  - Increase central/proximal perfusion
  - Achieve Hemodynamic Stability
  - Provide Time for Operative Preparation and Planning

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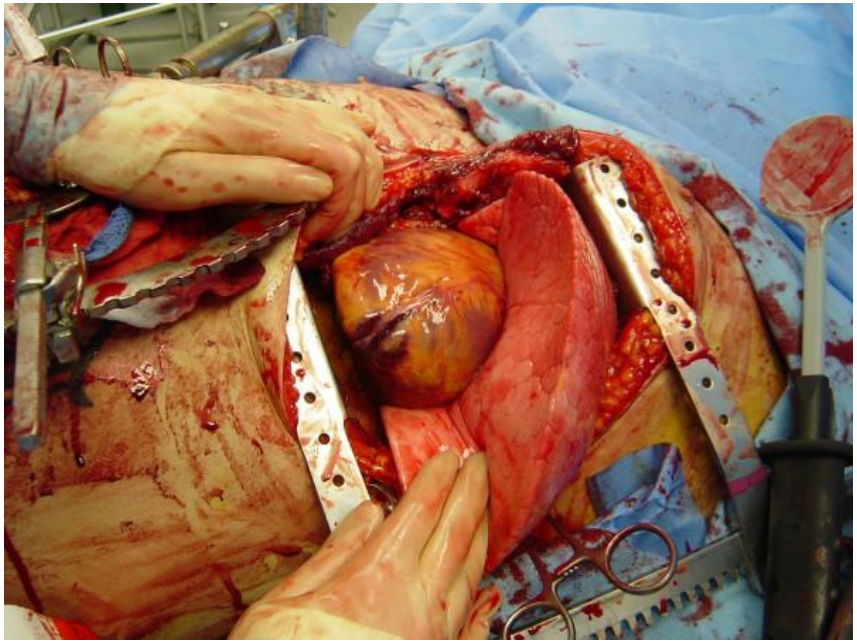

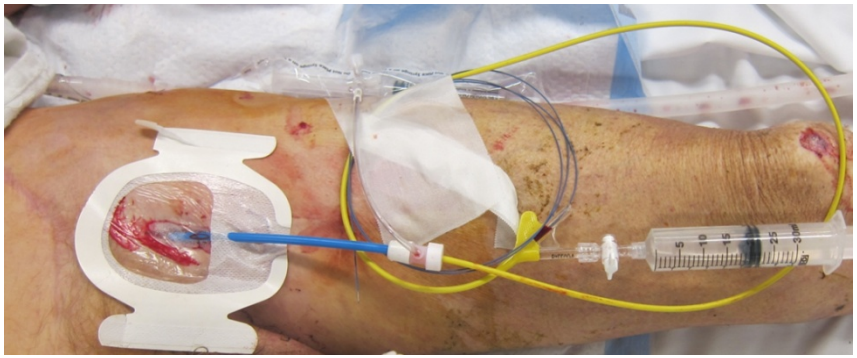

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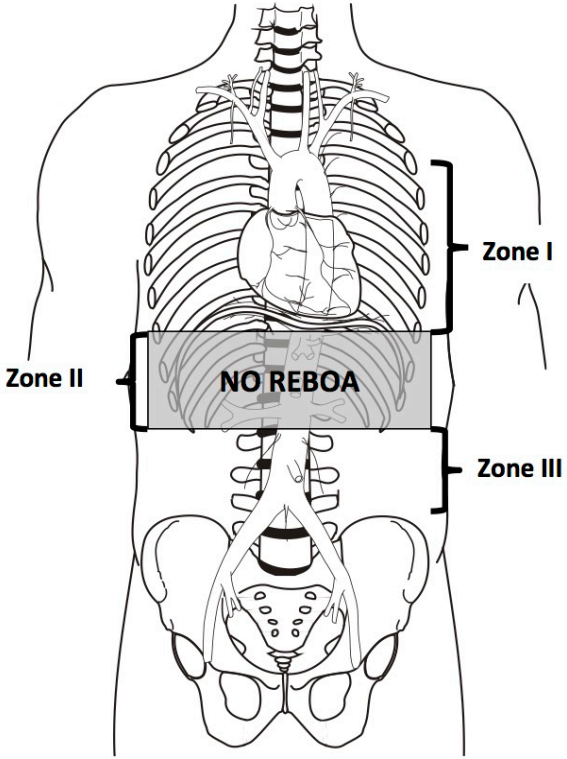

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PROCEDURES & TECHNIQUES

Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) as an Adjunct for Hemorrhagic Shock

Adam Stannard, MRCS, Jonathan L. Eliason, MD, and Todd E. Rasmussen, MD

Temporary occlusion of the aorta as an operative method to increase proximal or central perfusion to the heart and brain in the setting of shock is not new.[1] Resuscitative aortic occlusion with a balloon was reported as early as the Korean War and has been described in more recent publications.[2–5] Despite potential advantages over thoracotomy with aortic clamping, resuscitative endovascular balloon occlusion of the aorta (REBOA) for trauma has not been widely adopted. Broader application of this procedure may have lagged because of latent technology, a poorly understood skill set, or anticipated ineffectiveness of the technique. However, the recent evolution of endovascular technology and its clear benefit in managing vascular disease such as ruptured abdominal aortic aneurysm suggest that a reappraisal of this technique for trauma is needed. The objective of this report is to provide a technical description of REBOA.

To simplify, this maneuver can be considered in the following five steps each with specific procedural considerations (Table 1):

1. Arterial access
2. Balloon selection and positioning
3. Balloon inflation
4. Balloon deflation
5. Sheath removal

long sheath will be positioned in the femoral and external iliac artery. Access to the femoral artery can be obtained using one of three techniques: percutaneous, open exposure (i.e., cut down), or exchange over a guidewire from an existing femoral arterial line. Percutaneous access is now commonly accomplished under ultrasound guidance using the same probe applied for the focused abdominal sonography for trauma or focused assessment with sonography for trauma examination. In this scenario, a straight or linear array transducer is superior to a curvilinear transducer. Ultrasound or direct surgical identification of the femoral artery lateral to the vein is especially important in the hypotensive patient without a palpable pulse. Once identified, the artery should be entered at a 45-degree angle with a hollow 18-gauge needle through which a 0.035-inch wire can be passed. After the wire has been passed into the artery, the needle is removed and a small incision made at the interface of the wire and the skin. Next the sheath is placed over the wire into the artery. It is important that any time a sheath is passed over a wire into the arterial system, the sheath's internal dilator is firmly in place to allow a smooth reverse taper from the wire to the diameter of the sheath. Once the dilator and sheath have been advanced over the wire through the skin into the artery, the dilator is removed leaving the sheath as a working port through which other maneuvers can be accomplished. To

ORIGINAL ARTICLE

A clinical series of resuscitative endovascular balloon occlusion of the aorta for hemorrhage control and resuscitation

Megan L. Brenner, MD, Laura J. Moore, MD, Joseph J. DuBose, MD, George H. Tyson, MD, Michelle K. McNutt, MD, Rondel P. Albarado, MD, John B. Holcomb, MD, Thomas M. Scalea, MD, *and* Todd E. Rasmussen, MD

BACKGROUND: A requirement 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) for end-stage shock. The objective of this report was to describe implementation of REBOA in civilian trauma centers.

METHODS: Descriptive case series of REBOA (December 2012 to March 2013) used in scenarios of end-stage hemorrhagic shock at the University of Maryland, R. Adams Cowley Shock Trauma Center, Baltimore, Maryland, and Herman Memorial Hospital, The Texas Trauma Institute, Houston, Texas.

RESULTS: REBOA was performed by trauma and acute care surgeons for blunt (n = 4) and penetrating (n = 2) mechanisms. Three cases were REBOA in the descending thoracic aorta (Zone I) and three in the infrarenal aorta (Zone III). Mean (SD) systolic blood pressure at the time of REBOA was 59 (27) mm Hg, and mean (SD) base deficit was 13 (5). Arterial access was accomplished using both direct cutdown (n = 3) and percutaneous (n = 3) access to the common femoral artery. REBOA resulted in a mean (SD) increase in blood pressure of 55 (20) mm Hg, and the mean (SD) aortic occlusion time was 18 (34) minutes. There were no REBOA-related complications, and there was no hemorrhage-related mortality.

CONCLUSION: REBOA is a feasible and effective means of proactive aortic control for patients in end-stage shock from blunt and penetrating mechanisms. With available technology, this method of resuscitation can be performed by trauma and acute care surgeons who

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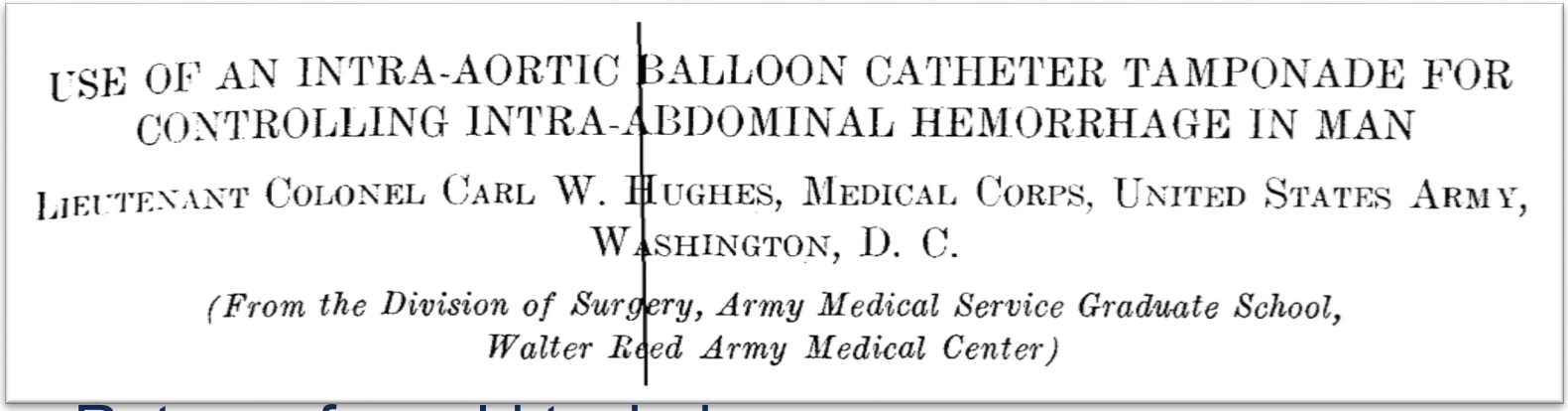
Background



USE OF AN INTRA-AORTIC BALLOON CATHETER TAMPONADE FOR CONTROLLING INTRA-ABDOMINAL HEMORRHAGE IN MAN

LIEUTENANT COLONEL CARL W. HUGHES, MEDICAL CORPS, UNITED STATES ARMY,
WASHINGTON, D. C.

(From the Division of Surgery, Army Medical Service Graduate School, Walter Reed Army Medical Center)

- Return of an old technique:
- First described in the Korean War by Lt. Col. Carl Hughes in 1954.
- 2 patients, but no survivors.

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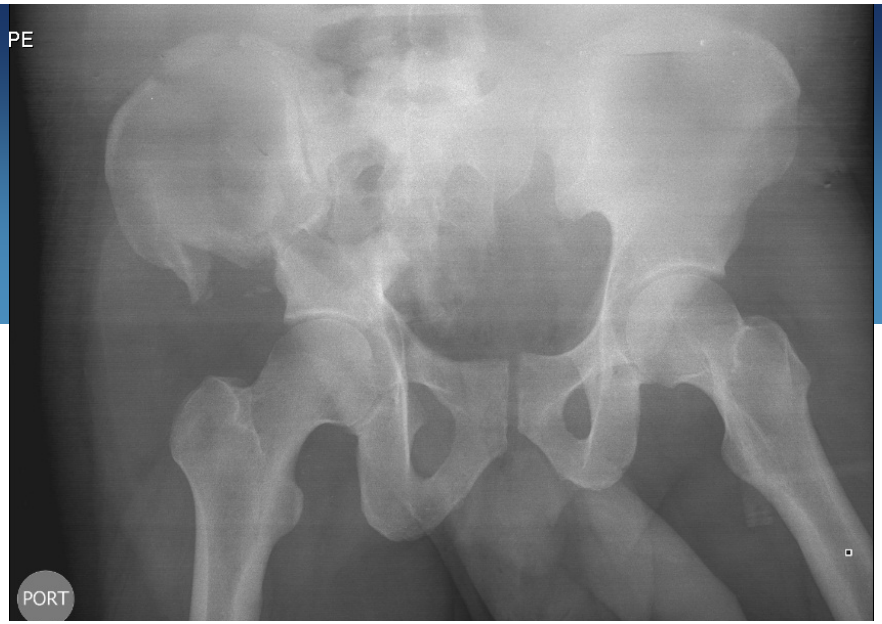

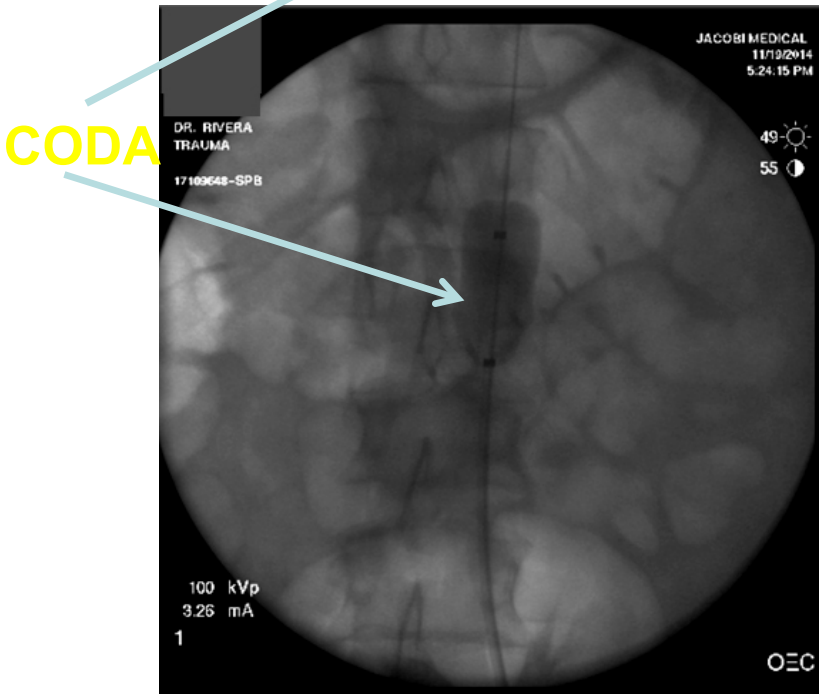

New York City's First REBOA CODA

- 32 Year old Male

Fall from a height of 6 Stories

November 2014

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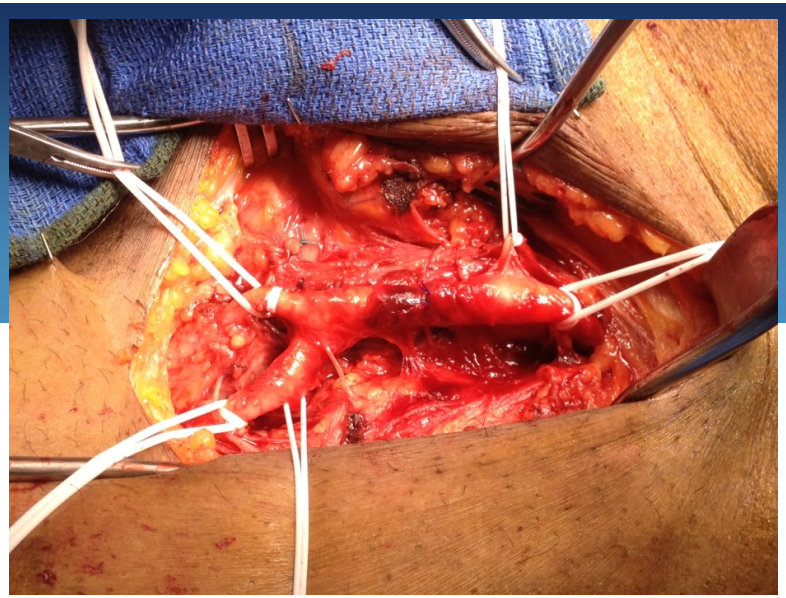

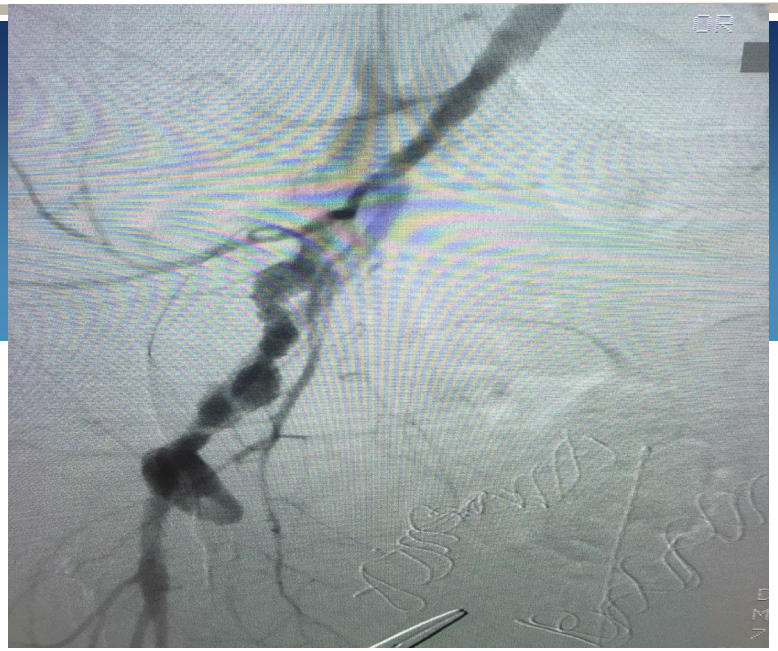

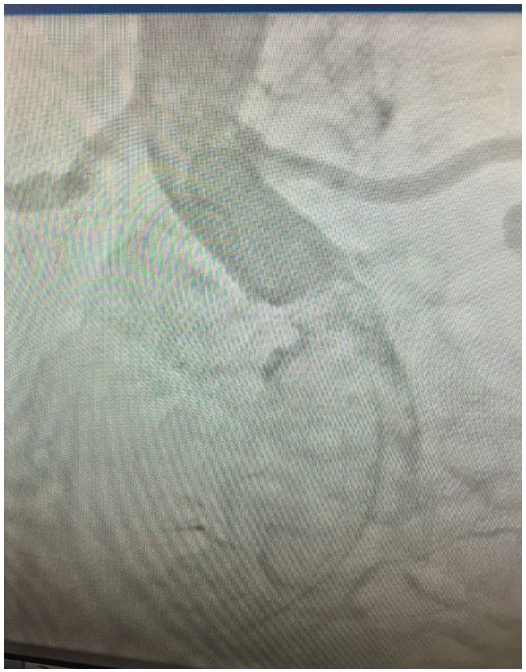


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What are we doing at JMC?

- Emergency Vascular Access Training for Acute Care Surgeons:
  - Objectives: To create a standardized course that will provide non-vascular surgeons the knowledge and techniques to safely obtain intraarterial access.
  - Specifically, the course will be geared to techniques designed to effectively establishing Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA).
  - After completion of the training, the surgeon should acquire the skills to perform REBOA in multiple different settings (Emergency Room, Operating Room).

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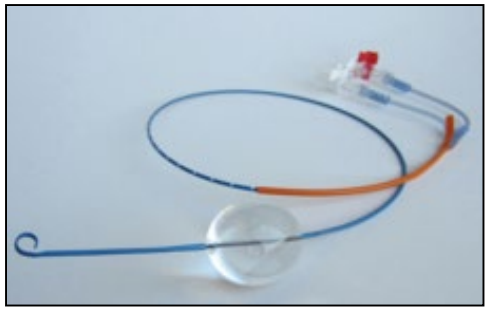
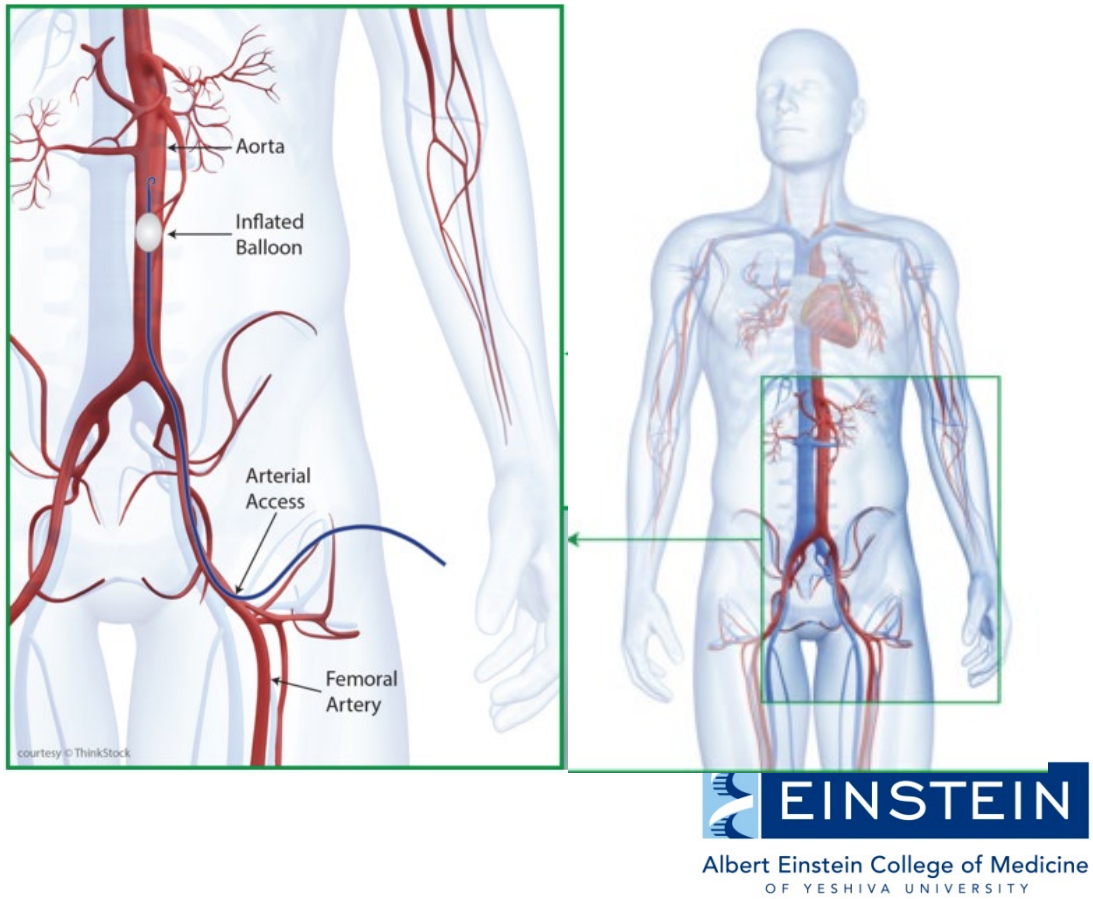
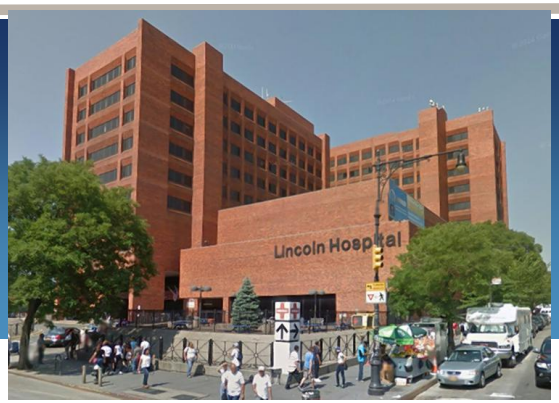
ER-REBOA™ Catheter:
Future of Care for Temporary Occlusion of Large Vessels

ER-REBOA™ Catheter: Product Overview



- Designed by trauma and vascular surgeons for the emergency and critical care setting to overcome limitations with existing techniques and technology
- A rapidly deployable, low-profile aortic occlusion system
- Small 7 Fr size, designed to preclude the need for additional surgical repair at the access site[19]

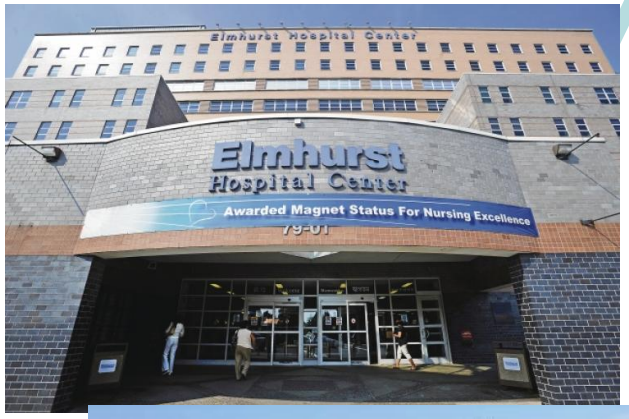




Lincoln

Jacobi

Harlem



Elmhurst

Bellevue

Kings
County

NYC-Jacobi REBOA Seminar

- Seminar for Trauma and Acute Care Surgeons
- Didactic Sessions by JMC Faculty
- Case Presentation and Discussion
- One of original REBOA researchers/developers
- Hands on sessions on simulators.

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Nanetta Hall – First ER-REBOA in NYC

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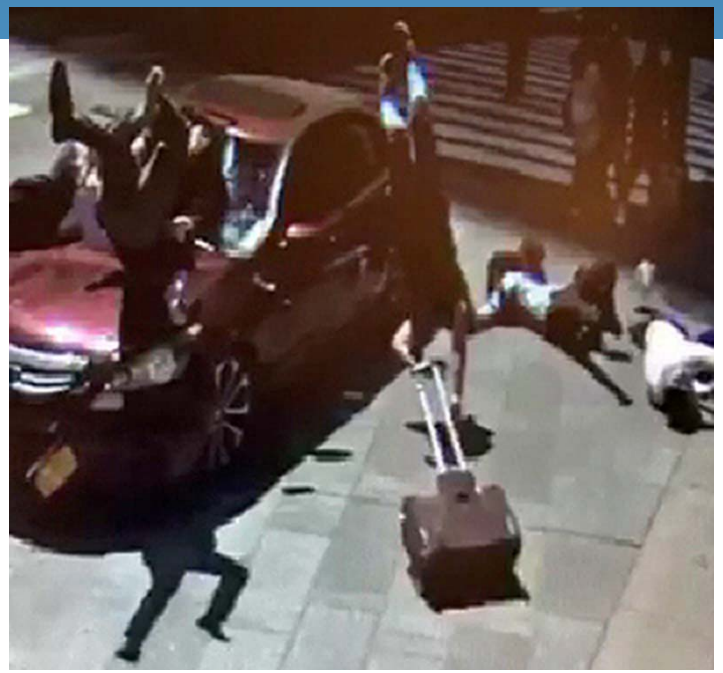
Time Square Car Attack- May 18,2017



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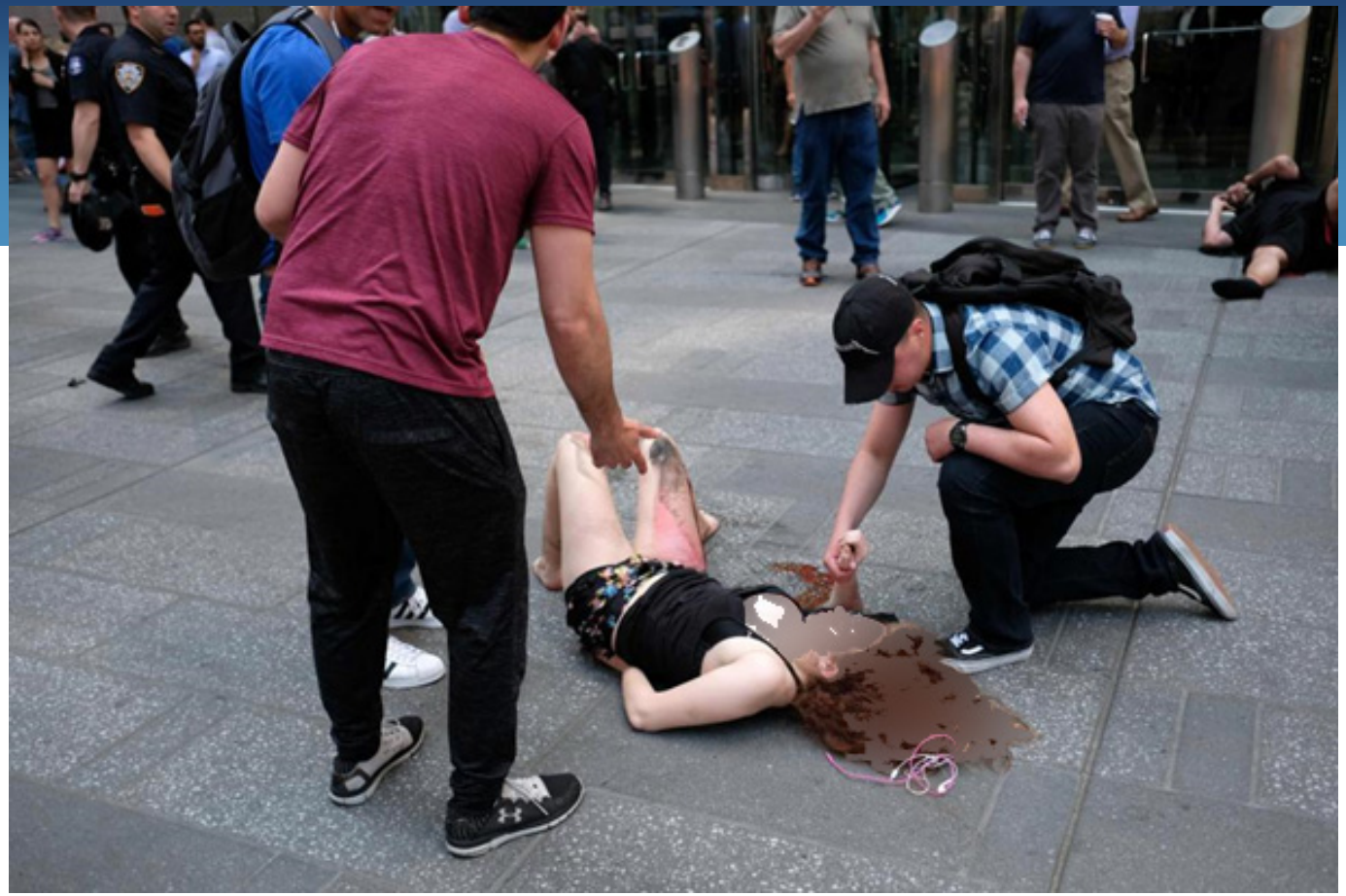

Taken to Bellevue's Level One ACS Trauma Center

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The New York Times

Inspired by War Zones, Balloon Device May Save Civilians From Fatal Blood Loss

Nanetta Hall, who had been run over by a pickup truck, was the first patient in the city to be treated with the ER-Reboa.
SAM HODGSON FOR THE NEW YORK TIMES

By DENISE GRADY
JUNE 19, 2017

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The Future

- Will become an adjunct for the care of trauma patients with life-threatening injuries.
- Techniques and devices will continue to evolve to overcome current pitfalls.
- Reports on use for OB-related hemorrhage and cardiac arrest

- Caution:
  - A set of complications will arise from the use of REBOA.

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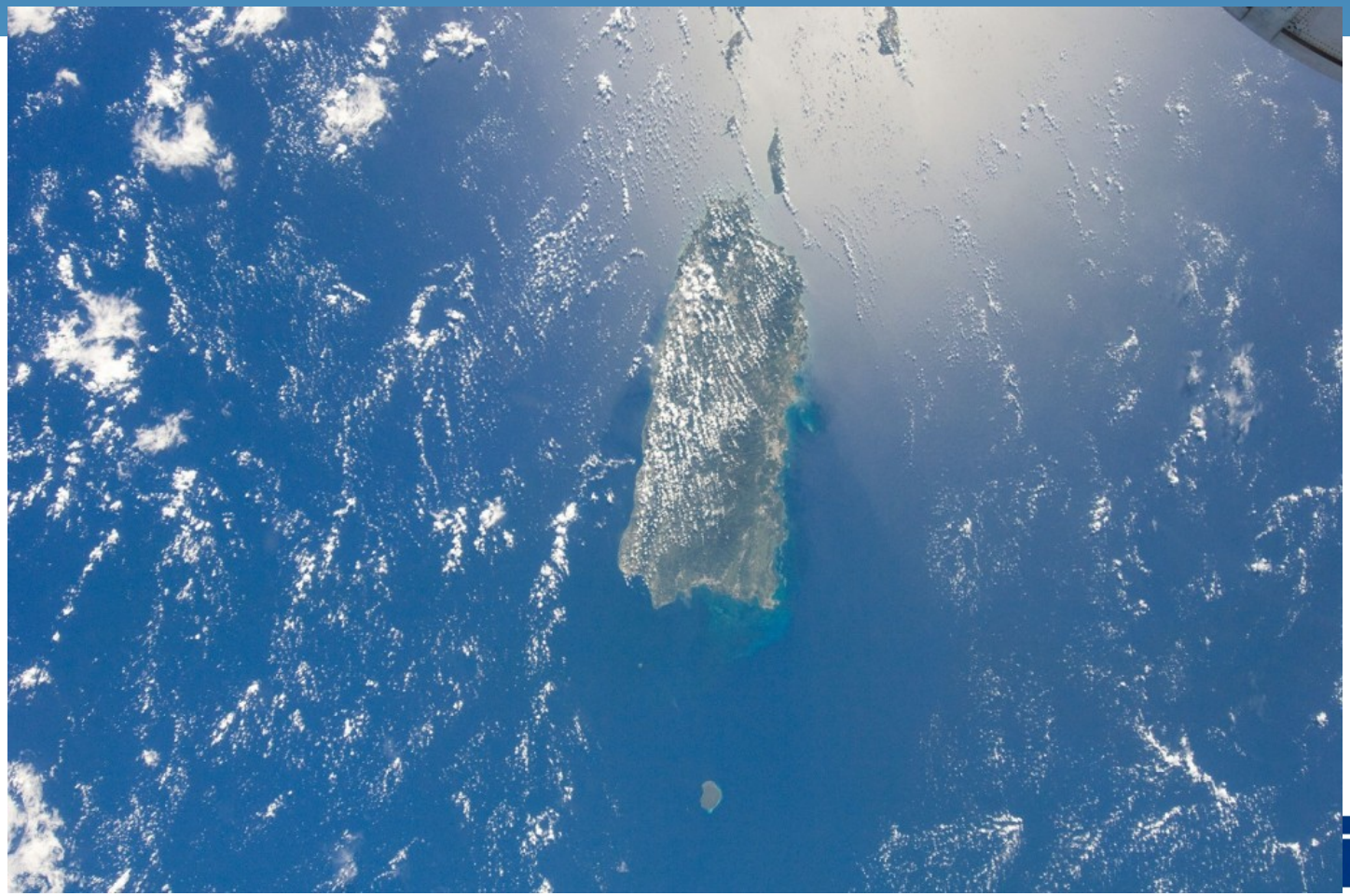

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