Clinical Pearls from the Preventable Mortality Review Committee

Q3 2022

Pelvic Bleeding

Pelvic bleeding is a potentially lethal condition, and it rarely occurs without pelvic fractures that can be diagnosed on pelvic x-ray during the initial trauma survey. An abdominal binder will stop most venous bleeding, but control of arterial pelvic bleeding, diagnosed by CT scan with contrast, frequently requires methods not available in an emergency department or in smaller hospitals. These methods include:

1. Angiographic embolization: requires interventional radiology, and delays increase mortality; this is the only definitive treatment that does not require subsequent interventions.
2. Preperitoneal pelvic packing: requires operating room and limiting laparotomy to just below the umbilicus: associated with surgical site infection but possible in most hospitals with an OR and general surgeons.
3. Bilateral temporary internal iliac ligation: requires laparotomy; now recommend temporary ligation with vessel loops or Rummel Tourniquet and readdressing at OR takeback. Possible in most hospitals with an OR and general surgeons.
4. REBOA (REsuscitative Balloon Occlusion of the Aorta): requires vascular access skills and is only a temporizing procedure because it stops blood flow below the balloon; associated with vascular complications, including leg loss.

Rapid diagnosis, damage control resuscitation, prevention of hypothermia, acidosis, and coagulopathy, and rapid transfer to a Trauma Center with these capabilities is essential to save lives.

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Confirming Death on Hospital Arrival

Recommend Performing the following before Confirming Death on Hospital Arrival

1. Confirm airway with direct (or video) laryngoscopy (because Continuous End Tidal Waveform capnography will not be accurate during cardiac arrest)
2. Treat potential tension pneumothorax (PTX): bilateral chest tubes, finger thoracostomy, or needle decompression in the 4-5th axillary intercostal space
3. Ultrasound of the heart shows no pericardial fluid and asystole (if tamponade is present, resuscitative thoracotomy should be considered)

Resuscitative thoracotomy should be considered **futile** when ANY of the following are true:

a) prehospital CPR exceeds 10 minutes after blunt trauma without a response
b) prehospital CPR exceeds 15 minutes after penetrating trauma without a response
c) asystole is the presenting rhythm, and there is no pericardial tamponade
d) blunt trauma with NONE of the following:

- pupillary response,
- spontaneous ventilation,
- presence of a carotid pulse,
- measurable or palpable blood pressure,
- extremity movement, or
- cardiac electrical activity

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3. Inaba K, et al. Optimal positioning for emergent needle thoracostomy: a cadaver-based study. Journal of Trauma and Acute Care Surgery. 2011 Nov 1;71(5):1099-103.
4. Seamon MJ, et al. An evidence-based approach to patient selection for emergency department thoracotomy: a practice management guideline from the Eastern Association for the Surgery of Trauma. Journal of Trauma and Acute Care Surgery. 2015 Jul 1;79(1):159-73.
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Confirming Intubation

Confirmation of proper endotracheal tube placement should be completed in all patients at the time of initial intubation in the hospital and out-of-hospital settings. Physical examination methods such as auscultating the chest and epigastrium, visualization of thoracic movement, and fogging in the tube are not sufficiently reliable to confirm endotracheal tube placement. Similarly, pulse oximetry and chest radiography are unreliable as sole techniques for determining endotracheal tube location. During intubation, direct visualization of the endotracheal tube passing through the vocal cords into the trachea, especially with a video-laryngoscope, constitutes firm evidence of correct tube placement, but additional techniques should be used as objective findings to confirm proper endotracheal tube position.[1]

Continuous End Tidal Waveform capnography is the most reliable method for confirming the initial and ongoing placement and function of an advanced airway and is considered the standard of care for in-hospital advanced airway management. Given the availability of waveform capnography, unrecognized misplacement of an advanced airway should never occur. Although colorimetric devices and capnometry can confirm initial advanced airway placement, they are less sensitive and specific in low-flow states such as cardiac arrest.[2]

Continuous and non-waveform capnography may be less accurate for patients in cardiac arrest and those with markedly decreased perfusion. If capnography is inconclusive, other confirmation methods, such as an esophageal detector device, ultrasound, or bronchoscopy, should be used.[1] Esophageal detector devices have been shown to have false positives in several situations and should not be used as the sole confirmatory method. Re-visualization via direct or video-laryngoscopy may be required if the above methods are unavailable.

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Damage Control Resuscitation Principles

Stop exsanguinating bleeding ASAP

- Primary survey is now XABCDE (X = exsanguinating hemorrhage; coming to ATLS)
- For abdominal bleeding this likely requires the operating room

Prevent hypothermia: Temp goal >36 C. or > 98.6 F.

Permissive hypotension: SBP <85mmHg until major blooding is stopped

For treating bleeding: Whole Blood > platelets/plasma > RBC > Plasmalyte/Normosol > normal saline

Give calcium with massive transfusion: 1 gm at the start and with each round of MTP

Crystalloid & vasopressors are bad for bleeding patients.

- If must use: Vasopressin > Vasopressors (eg, norepinephrine, phenylephrine, etc.)
- Vasopressin 4 units IV to start > 0.04 units / minute infusion is standard dose

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Arkansas Trauma System