Prehospital Trauma Care: Rethinking Traumatic Cardiac Arrest in Austin!

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What's Your Plan??
Why bother??

- Survival rates: 0.77%-1.5%
- Some studies have recommended asystole as a contraindication in PTCA resuscitation
Should ALS be initiated??

- Journal of Acute Care Surgery 2013
- Retrospective cohort study 2006-2009
- Evaluated survival rates in Post-Traumatic Circulatory Arrest

Should ALS be initiated??

• BLS and ALS units dispatched for TCA + EMS Supervisor

• ALS includes:
  • Intubation
  • IV fluids
  • Medication administration
  • POC Ultrasound
  • POC lab testing
  • Chest tube
  • Pericardiocentesis
Mechanism of Arrest

- MVC: 40%
- Assault, Stab, GSW: 27%
- Fall from Height: 17%
- Other: 16%

Legend:
- MVC
- Assault, Stab, GSW
- Fall from Height
- Other
• 49.1% ROSC
• 6.6% CNR
• Children: 23% survival
• Adults: 5.7% survival
• Elderly: 3.7% survival
How much time do you have?

- Mean response time for survivors: 6.9 min
- Mean response time for non-survivors: 9.2 min
- **AFTER 10 MINUTES** from the time of the initial incident: **zero survivors**
What difference does the rhythm make?

<table>
<thead>
<tr>
<th></th>
<th>ROSC</th>
<th>CNR</th>
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</thead>
<tbody>
<tr>
<td>VF</td>
<td>90.9%</td>
<td>36.4%</td>
</tr>
<tr>
<td>PEA</td>
<td>60.5%</td>
<td>7%</td>
</tr>
<tr>
<td>Asystole</td>
<td>40.2%</td>
<td>2.7%</td>
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</tbody>
</table>
Fluid Resuscitation

ROSC

- Patients with ROSC received significantly more fluids
- 1,888ml crystalloids vs. 890ml
- 488ml colloids vs. 184ml

CNR

- No significant difference in fluid amounts given in those who achieved CNR
• Pit Crew CPR for Trauma
• POC Ultrasound + PCT
• Whole Blood
• REBOA? *EMS Physician Only
• Simple (Finger) Thoracostomy
• Pit Crew CPR for Trauma
• POC Ultrasound + PCT
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• Simple (Finger) Thoracostomy
Needle Thoracostomy

- 3.2-4.5 cm catheter
  - Estimated Failure rate 50-65%
- 5 cm catheter
  - Estimated Failure rate 42.5%


Simple Thoracostomy

in 1991 Delooz stated that ‘if the highest expertise is involved on the scene, prehospital care will not cause delay; on the contrary, it will result in earlier definitive care, limitation of oxygen debt and transfer to the most appropriate trauma care facility’.”
Simple Thoracostomy

Italy
- 55 patients
- No complications

UK (London HEMS)
- 4/17 ROSC
- No complications
- No survivors
Simple Thoracostomy: Moving Beyond Needle Decompression in Traumatic Cardiac Arrest

Fri, Mar 28, 2014 | By Mark E.A. Escott, MD, MPH, FACEP, Guy R. Gleisberg, MBA, BSEE, NREMT-B, EMS-I, Kasia Kimmel, MD, Andrew Karrer, LP [Andrew Karrer, LP], Jared Cosper, BS, LP [Jared Cosper, BS, LP], Brett J. Monroe, MD

Needle thoracostomy, by the anterior approach, is currently the preferred emergent EMS chest decompression procedure. Photo Kevin Nutt/Montgomery County Hospital District
The MCHD EMS Experience
Training

• Didactic presentation
• Part-task Trainers
• Live Tissue Lab
• PHYSICIAN EDUCATORS!
• REGULAR RETRAINING!!
Indications

Traumatic cardiac arrest with known or suspected injury to the chest and/or abdomen
Contraindications

Any patient that has cardiac output, including hypotensive patients.

Last known alive > 10 minutes.
Simple Thoracostomy

4th or 5th intercostal space midaxillary line
Simple Thoracostomy Procedure

Utilize blunt dissection with finger or forceps to get through the intercostals.

Grasp Kelly forceps at curve to maintain control.

Pierce through the pleura with forceps, expand forceps
Simple Thoracostomy Procedure

Insert finger into pleural cavity, ensure lung is palpated and expanded or expands.

If possible, feel caudally for the diaphragm.

Allow the soft tissues to fall back over the wound, this will act as a flap valve.
Mechanism of TCA

- Penetrating: 28%
- Non-penetrating: 72%
Rhythm on Arrival

Initial Rhythm

- PEA: 66%
- Asystole: 21%
- VF/VT: 7%
- Missing data: 6%
The MCHD Experience

- 46 Patients
- 12 ROSC (26%)
- 5 Survival 24hr (11%)
- 3 Survival to DC with CNR (6.5%)
Why Bother??
YOUR SEASON OF HOPELESSNESS IS OVER
References


- Prehospital Management of Patients with Severe Thoracic Injury: Injury; 1995, 26(9):581-585
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