Resuscitative Thoracotomy

PURPOSE

The indications for resuscitative thoracotomy (RT) have evolved significantly since the late 1800’s, when it was first employed in clinical practice. It is a procedure of last resort, and controversy surrounds its use given the lack of published RCT’s.

BACKGROUND

Overall RT success rate for patient in shock from a penetrating cardiac wound – 35%, all patients with penetrating wounds – 15%, blunt trauma with shock – 2%, blunt trauma without signs of life - < 1%.

Signs of life include any of the following: papillary response, spontaneous ventilation, carotid pulse, measurable/palpable BP, extremity movement, cardiac electrical activity

SURVIVAL DATA & RECOMMENDATIONS FROM EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA (2015)

* recommendations limited by lack of inclusion of arrest duration
** “Survival and neurologically intact survival are rare after more than 15 minutes of CPR regardless of injury mechanism”

A. Penetrating thoracic injuries presenting pulseless with signs of life

- Survival without RT: 2.8% (range 2-5%)
- Penetrating mechanism (stab vs. GSW) strongly predictive of outcome
- Patients were 8 times more likely to survive after RT, 5 times more likely to survive neurologically intact
- RECOMMENDATION: RT

B. Penetrating thoracic injuries presenting pulseless without signs of life

- Survival without RT: 0.2% (range 0-2%)
- Patients were 41 times more likely to survive after RT, 20 times more likely to survive neurologically intact
- CONDITIONAL RECOMMENDATION FOR RT

C. Penetrating extrathoracic injuries presenting pulseless with signs of life

- Survival without RT: 1.7% (range 1-5%)
- Patients were 9 times more likely to survive after RT, 11 times more likely to survive neurologically intact
• CONDITIONAL RECOMMENDATION FOR RT (does not pertain to patients with isolated cranial injuries)

D. Penetrating extrathoracic injuries presenting pulseless without signs of life

• Survival without RT: 0.1% (range 0-1%)
• Patients were 29 times more likely to survive after RT, 56 times more likely to survive neurologically intact
• CONDITIONAL RECOMMENDATION FOR RT (low quality of evidence)

E. Blunt injuries presenting pulseless with signs of life

• Survival without RT: 0.5% (range 0-3%)
• Patients were 9 times more likely to survive after RT, 8 times more likely to survive neurologically intact
• RECOMMENDATION: RT

F. Blunt injuries presenting pulseless without signs of life

• Survival without RT: 0.001% (range 0-0.01%)
• RT does not improve survival in this patient cohort
• CONDITIONAL RECOMMENDATION AGAINST RT (low quality of evidence)

RECOMMENDATIONS FROM WESTERN TRAUMA ASSOCIATION (2012)

• Blunt traumatic under CPR with < 10 minutes of prehospital arrest – RT
• Penetrating trauma under CPR with < 15 minutes of prehospital arrest – RT
  o Penetrating neck/extremity trauma with > 5 minutes of prehospital arrest without signs of life heralds non salvageability
• Profound refractory shock (signs of life or SBP < 60) – RT
• After performing the thoracotomy and pericardotomy, the patient’s intrinsic cardiac activity is evaluated
  o patients in asystole without cardiac tamponade are declared dead
  o patients with a cardiac wound, tamponade, and asystole are aggressively treated
RECOMMENDATIONS FROM AHA (2005)

**TABLE. Suggested Indications for Resuscitative Thoracotomy: Patients With Traumatic Cardiac Arrest**

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>Blunt trauma</td>
<td>• Patient arrives at ED or trauma center with pulse, blood pressure, and spontaneous respirations, experiences witnessed cardiac arrest</td>
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<tr>
<td>Penetrating cardiac trauma</td>
<td>• Patient experiences a witnessed cardiac arrest in ED or trauma center</td>
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<tr>
<td>Penetrating thoracic (noncardiac) trauma</td>
<td>• Patient experiences a witnessed cardiac arrest in ED or trauma center</td>
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<tr>
<td>Exsanguinating abdominal vascular trauma</td>
<td>• Patient experiences a witnessed cardiac arrest in ED or trauma center</td>
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REFERENCES


