

Action:	Trauma Team Members				
Info:	Cardio-Thoracic Consultants and Middle Grades				
Related documents:	Trauma Call SOP DCS SOP				
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EMERGENCY "CLAM SHELL" THORACOTOMY FOR THE NON-SPECIALIST

NB Bleep cardiac theatre team & Thoracic consultant immediately – in the interim proceed as follows:

NB Kit in ED but internal paddles and more extensive kit can be summoned from Thrusel ward.

Indication

Penetrating Chest / Epigastric trauma with witnessed cardiac arrest within 10 mins (any rhythm)

Contraindications

Definite loss of cardiac output for greater than 10 minutes

Any patient who has a cardiac output.

Blunt trauma



- 1 Intubation etc should be performed by others whilst skin is prepared without delaying thoracotomy.
- 2 Make bilateral large thoracostomies (breaching the intercostal muscles and parietal pleura) in the 5th IC space in mid-axillary line—NB stop at this point if tension pneumothorax is decompressed and cardiac output returns.
- 3 Connect the thoracostomies with a deep skin incision following the 5th intercostal space.
- 4 Insert two fingers into thoracostomy to hold lung out of the way while cutting through the intercostal muscles and pleura towards the sternum using heavy scissors. Do this on both sides leaving only a sternal bridge between.
- 5 Cut through sternum using the heavy scissors. If unable, pass Gigli saw beneath sternum & saw thru with large strokes.
- 6 Open with retractors/rib spreaders. If exposure is inadequate extend the incisions posteriorly.
- 7 "Tent" pericardium with forceps and make large midline longitudinal incision using scissors. Too short an incision limits access. Try to avoid the phrenic nerve!
- 8 Evacuate all blood and clot present, then inspect the heart rapidly but systematically for the site of bleeding.
- 9 One of three scenarios are now likely:
 - a. Good cardiac output returns – close any cardiac wounds as described below.
 - b. The heart begins to beat slowly with a considerably reduced cardiac output - close any cardiac wounds as described below. Then perform supplementary internal cardiac massage.
 - c. The heart remains in asystole. In this case wounds should be quickly closed and then attempts made to restart the heart as in step 9b. When massage is required it must be of optimal quality. The heart must remain horizontal during massage. Lifting the apex of the heart too far out of the chest can prevent venous filling.
- 10 Control any bleeding:
 - Holes < 1 cm can often be occluded with finger or gauze swab- or use 3/0 prolene (trying to avoid coronary artery)
 - For larger defects, a Foley urinary catheter can be passed through the hole then inflated and gently pulled back. This technique reduces the volume of the ventricular cavity (with subsequent reduction in stroke volume) therefore only a small volume (<10 ml) should be used in the balloon. Ensure that the catheter is clamped to prevent blood loss from it. If a catheter is used in this way, a "giving set" can be attached to permit rapid volume infusion directly into the heart.
 - If bleeding cannot be controlled with finger/gauze/Foley catheter, it may be necessary to close the defect with large sutures, but it should be emphasised this is a last resort as there is a risk of occluding coronary arteries. If sutures are used the minimum required to achieve haemostasis facilitated by finger/gauze/Foley catheter should be used. Non-absorbable size 0/0 or 1/0 monofilament or braided are appropriate; take 1–2 cm "bites".
- 11 If defibrillation is required use internal paddles with an initial energy level of 20 joules.
- 12 Success will be associated with bleeding from internal mammary & intercostal vessels. Bleeders may be controlled with forceps.
- 13 X-Clamp of single lung hilum may be needed to control bleeding and allow visualization of underlying defect.
- 14 If appropriate Hand pressure on descending Aorta will reduce distal blood loss prior to cross-clamp by thoracic surgeon.

AK Aug 2005

Ref: Emergency **thoracotomy**: "how to do it". **Wise et al** *Emerg Med J* 2005; 22:22-24