Midlands Critical Care, Trauma and Burns Networks
Network: North West Midlands and North Wales Trauma Network
Publication:
Document name: **Guidelines for aftercare following a successful resuscitative thoracotomy in a trauma unit**
Document purpose: locally appropriate guidelines for the ongoing care and transfer of patients in the event of a successful thoracotomy outcome'
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Publication date: May 2019 Review date: 2021 Review next due: May 2023 Ref No. 48
Target audience: Trauma Units in North West Midlands Trauma Network
Action required: Add to network website, circulate to NWM&NW TN board.
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Background

The North West Midlands and North Wales Trauma Network has issued guidelines for resuscitative thoracotomy. These focus on when the procedure should be performed and how to undertake it, but end by stating that if the patient recovers a cardiac output, they should be transferred to the operating theatre immediately.

In a Major Trauma Centre with on-site Cardiothoracic Surgery, this should be fairly straightforward. Should the procedure be performed in a Trauma Unit, however, the picture is substantially different, and the patient will require an inter-hospital transfer in order to access definitive surgical care.

In April 2017, The Royal College of Emergency Medicine issued a position statement supporting the use of resuscitative thoracotomy in a TU when it is indicated. The guidance states that all TUs should develop 'locally appropriate guidelines for the ongoing care and transfer of these patients in the event of a successful outcome'.

Guidance

It is reiterated here that resuscitative thoracotomy must **only** be attempted if all of the indications for the procedure are met: the patient must have sustained a **penetrating** injury to the thorax or upper abdomen, must be in cardiac arrest, and must have had a confirmed cardiac output **within the last 15 minutes.**

The procedure should **not** be attempted for blunt trauma patients, unless all the following apply: the patient must have a **proven** cardiac tamponade (on echo or CT), must have sustained their cardiac arrest in front of the resuscitating team, and must have no other obvious cause for the arrest. Thoracotomy may then be **considered.** This is in accordance with the existing network guidelines.

It is also reiterated that this guideline is intended as a companion to the network guidelines already issued, and is not intended to replace them. The details of the procedure are covered by those guidelines, and will not be described again here.

1. Haemopericardium

The vast majority of patients who have a return of circulation following a thoracotomy will do so after the release of a haemopericardium. Should this occur, then the heart itself should be inspected for haemorrhage. The primary cardiac wound may in fact have sealed itself. If there is no active blood loss, the patient should be packaged for transfer as below.

2. Active cardiac haemorrhage

ROSC may potentially occur if bleeding from a cardiac wound can be controlled successfully (either before or after release of the haemopericardium). Direct finger compression is most likely to be successful, and to have the least complications. If this fails, primary repair of the wound may be attempted using either 3/0 or 4/0 Prolene – this may be supported with the use of a collagen patch dressing such as Hemopatch. This may be technically difficult. The use of surgical staples, or of Foley catheters inflated inside the ventricle, is not recommended.

If haemostasis can be achieved by these means, then the patient should be packaged for transfer as below. If it cannot, then direct pressure (or a 'finger in the hole') should be maintained on the injury, and further advice should be sought urgently from the Cardiothoracic consultant at Royal Stoke University Hospital (see below).

3. Intra-thoracic bleeding

In a very few cases, ROSC may potentially occur after bleeding from another intra-thoracic location is controlled by direct pressure. Should this occur, the pressure should be maintained, and further advice sought urgently from the Cardiothoracic consultant at RSUH (see below).

Packaging for transfer to RSUH

If the return of circulation is sustained once any active bleeding has been controlled, then resuscitative efforts should continue. Sedation/anaesthesia will be required, due to the possibility of the patient regaining awareness. It is vital to maintain a secure, definitive airway (the patient should have been intubated prior to, or at the same time as, the thoracotomy).

Contact should be made urgently with the Cardiothoracic consultant on call for RSUH (rather than with the Trauma Team Leader, as is the usual ED practice). They will issue

further advice: this will include making a decision as to whether the patient should be transferred urgently to RSUH, or whether the consultant should go to the TU to manage the patient.

Should transfer be considered, the Trauma Team Leader for RSUH should be contacted without delay, as they will be responsible for receiving the patient on their arrival.

If the patient is to be transferred, the skin overlying the chest wound should be closed to decrease the risk of infection. A large swab soaked in Betadine should be placed in the wound prior to closure. The material used for the closure is not of vital importance as it will be removed later in theatre – a sticky drape is recommended, but large silk stitches or surgical staples are acceptable options. Bilateral chest drains should be placed prior to wound closure, to prevent secondary tension pneumothorax during transit.

In North Wales, patient transfer should take place according to the Welsh Government 'Designed for Life' guidelines, with an appropriately trained medical escort. These guidelines are available here:

http://www.wcctn.wales.nhs.uk/sitesplus/documents/1210/Guidelines%20for%20the%20transfer%20of%20the%20critically%20ill%20adult_Approved_2017.pdf

During daylight hours, assistance may be sought from EMRTS Cymru (the Emergency Medical Retrieval and Transport Service).

Trauma Units in the parts of England served by the North West Midlands and North Wales Trauma Network should follow the Midlands Critical Care Transport Group guidelines, available here:

https://www.mcctn.org.uk/transfer-policy.html

Further advice on packaging and transfer is available from the Trauma Resuscitation Anaesthetist at RSUH. The TRA can be contacted via the Trauma Team Leader at RSUH on request.