Clinical Practice Guidelines
Escharotomy for Burn Patients
NSW Statewide Burn Injury Service

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1. Indications

Circumferential full thickness & deep dermal burns of the chest or limbs with circulatory or respiratory compromise[1].

Consultation with the relevant burns unit should always be made before embarking on escharotomy[2]

1.1 Limb

Escharotomy is indicated when the circulation is compromised due to increased pressure in the burned limb and can not be relieved by simple elevation[2]. The burned skin is rigid and increasing oedema under this inflexible skin may interfere with circulation. Elevation of the affected limb should always be done first and then closely monitored.
Signs in a limb that may indicate the need for an Escharotomy are:

- Loss of circulation
    - Pallor, cyanosed
    - Reduced or absent capillary return related to capillary return in non burned areas
    - Coolness
    - Loss of palpable pulses (late sign)
    - Decrease pulse pressures as measured by Doppler ultrasound[2]
- Numbness
- Decreased oxygen saturation as detected by pulse oximetry

1.2 Chest

Escharotomy should be considered when a circumferential burn of the chest wall results in respiratory compromise by restricting normal chest wall movement[1,2]. Under some circumstances escharotomy may be necessary for non circumferential burns of the chest wall if chest wall movement is restricted.
Circumferential burns of the abdomen may also cause respiratory compromise by restricting diaphragmatic movement. Infants under 12 months are particularly vulnerable since respiration is predominately diaphragmatic[1]. Under these circumstances a subdiaphragmatic transverse escharotomy may be necessary.

Flame burns of the chest are often accompanied by burns to the face and neck and are commonly associated with an inhalation injury.
Consider the inhalation injury high priority.

- Secure the air way
- Oxygen by rebreathing mask at 8 ltr/min[1]
- Endotracheal intubation should be considered early if the airway is compromised.

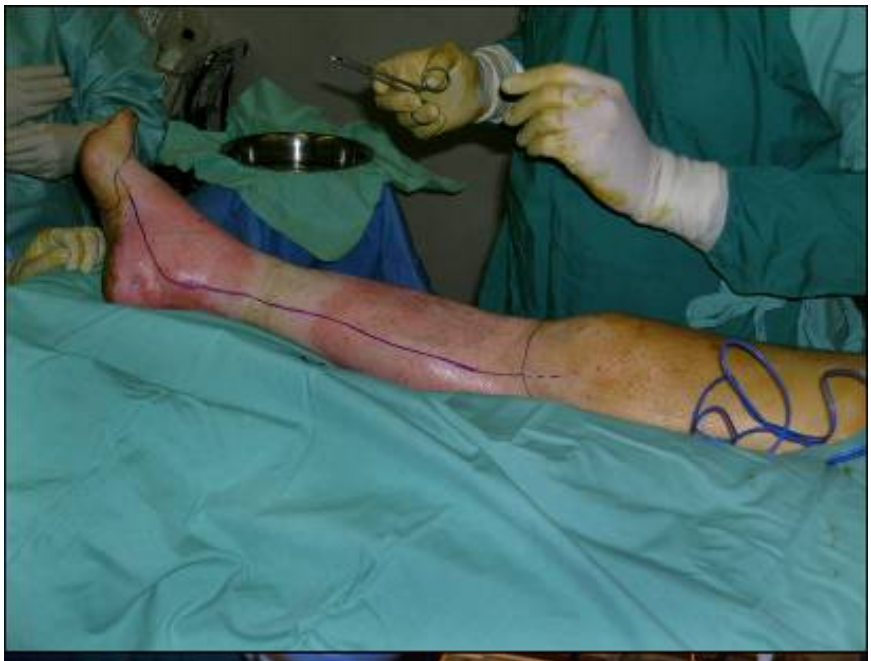
Once the airway has been secured consider chest escharotomy if there is-:

- Circumferential full thickness burns of the thorax and abdomen.
- Restricted movement of the chest wall or abdomen
- Reduced air entry bilaterally
- Shallow respiratory effort
- Tachypnoea
- Hypoxaemia
- NB. In paediatric patients burns to the abdomen may compromise respiratory function due to their abdominal breathing pattern.

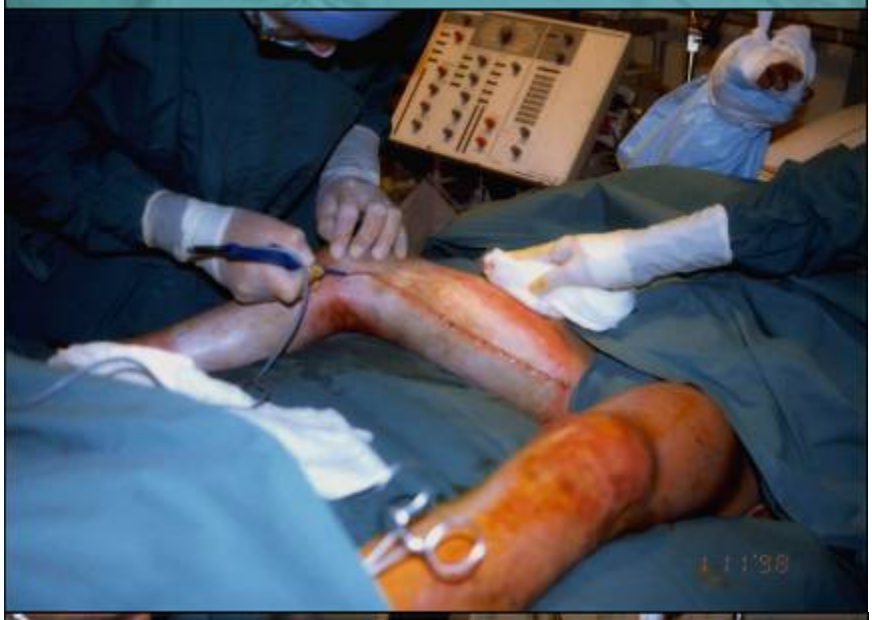
2. Instruction on performing Escharotomy[1]

If advised by the Burns Unit, escharotomies should be performed under the following guidelines:
Limbs: incisions should be performed in the “mid axial line” bilaterally
(see schemas below)

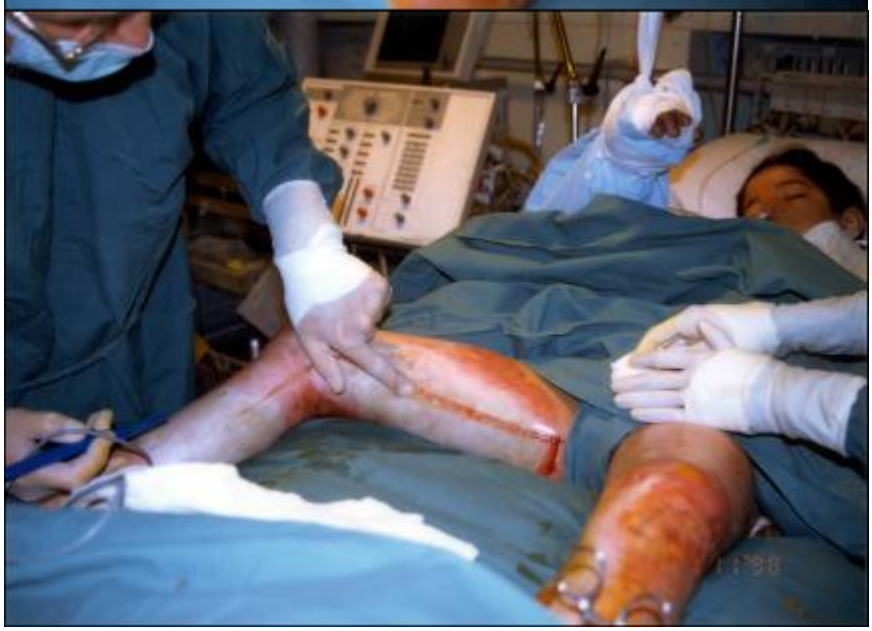
- Generally no anaesthetic is required in adults- the patient should be appropriately sedated and given adequate pain relief[3]. **General anaesthetic should be used for children**
- Always start and finish the incision one centimetre into unburned healthy tissue where possible[1] **(use local anaesthetic for the unburned skin)**
- Sterile procedure with adequate drapes
- **Before starting, the upper limb should be in the supine position, and the lower limb in the neutral position.**
- Avoid the ulnar nerve at the elbow and common peroneal nerve at the knee (see diagram for those and other areas to avoid)[2]
- Incisions of the limbs are in the mid-axial lines between flexor and extensor surfaces; avoid incisions across the flexural creases of joints[1]. Mark anatomical “at risk areas”
- For the chest, incisions along the mid axillary lines, continuing over the abdominal wall if the burn extends to this region. A transverse elliptical incision across the abdomen below the costal margin can be made joining the vertical incisions.
- Draw a line where you will make the incision
- Full thickness incision into subcutaneous fat sufficiently to see obvious separation of the wound edges[3]
- Running a finger along the incision will detect residual restrictive areas
- Incision needs to be on both sides of limb or chest to restore circulation
- Ensure the adequacy of the incisions by reassessing the circulation or respiration (there should be a noticeable separation and relief of pressure from tight “tourniquet” effect of burn
- Have diathermy or ligatures available for haemorrhage control
- Dress wounds with alginate dressing eg Kaltostat® or Vaseline gauze
- Continue to assess limb circulation/chest expansion to ensure the procedure is effective[3]



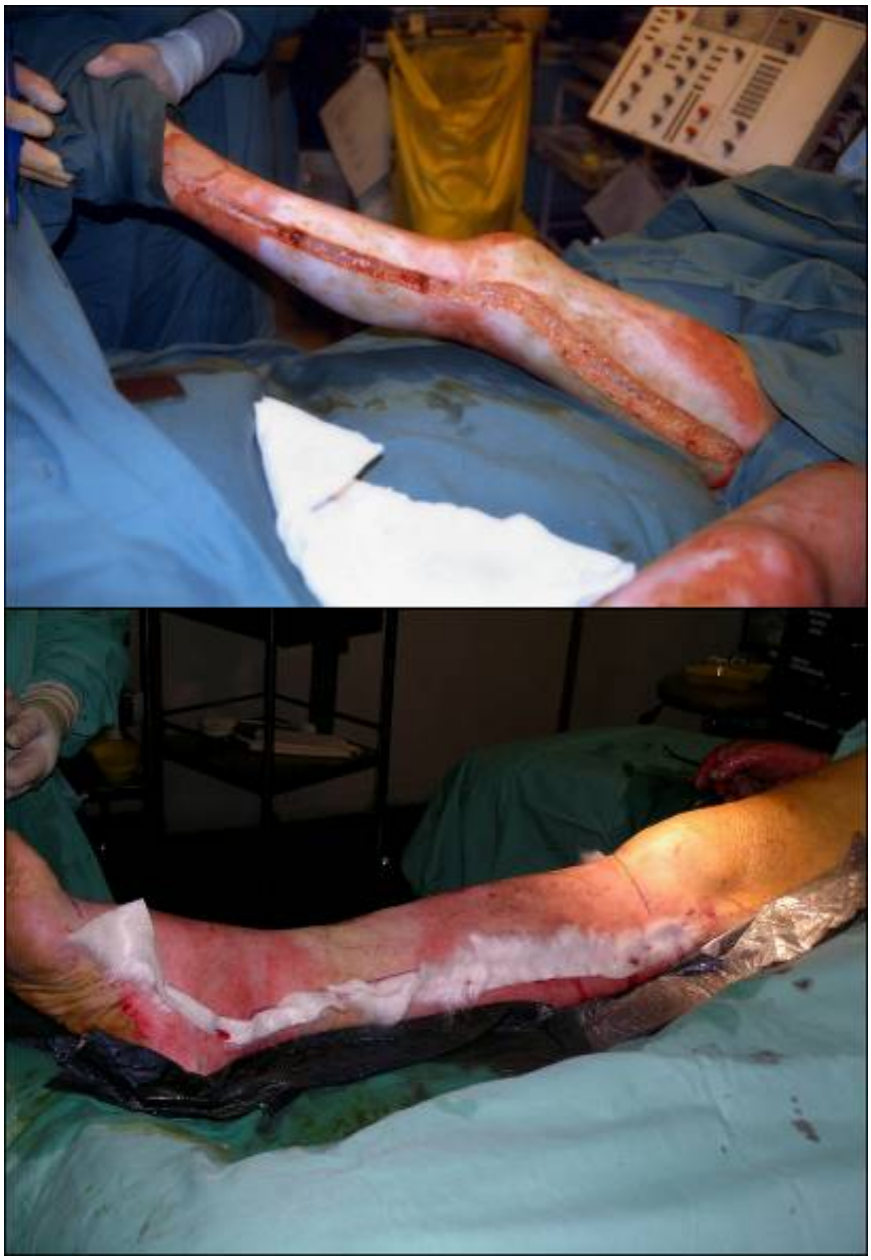
Plan where incision to be made



Incision using diathermy



Checking adequacy of incision



Complete
Note separation of eschar relieving pressure

Dressing of incision

3. References / Bibliography

1. Australian & New Zealand Burn Association, Emergency Management for Severe Burn Injuries Manual; Edition 15, 2011
2. Orgille DP & Piccolo N 2009, 'Escharotomy and decompressive therapies in burns', *Journal of Burn Care & Research*, vol 30, pp759-768.
3. Feldmann ME, Evans J & Seung-Jun O 2008, 'Early management of the burned pediatric hand', *Journal of Craniofacial Surgery*, vol 19, no 4, pp 942-950.

ESCHAROTOMY GUIDELINES

AIM

- To release rigid and inelastic burnt skin (eschar) to allow
    - Circulation (in a limb)
    - Breathing (when chest involved)
- BEFORE problems arise OR to treat an existing problem

INDICATIONS

- Compromised circulation in a limb with circumferential deep dermal to full thickness burn
- Amount of predicted or actual swelling (oedema, fluid resuscitation)
- Respiratory compromise with deep dermal to full thickness burns to chest (may not be circumferential particularly in paediatric patients)

ENVIRONMENT/EQUIPMENT

- Diathermy (or scalpel), skin prep, drapes and crepe bandages
- Dressing Pack (contains Algisite®, Bactigras® and Melonin®)
- Generally no anaesthetic is required in adults- the patient should be appropriately sedated and given adequate pain relief. **General anaesthetic should be used for children**
    - Can be done in ED/resus/ICU with local anaesthetic
    - Can be done with scalpel but will need diathermy to control bleeding

PROCEDURE

- ENSURE limb is in anatomical position (forearm supinated NOT pronated)
- Draw a line where the incision will be made
- Prep wound with chlorhexidine or non-alcoholic Betadine skin prep
- Cut with either diathermy or scalpel along lines (see diagram other side)

Limbs – release both medial and lateral sides
Chest – release bilateral mid axillary lines and inferior transverse elliptical below costal margin joining vertical incisions

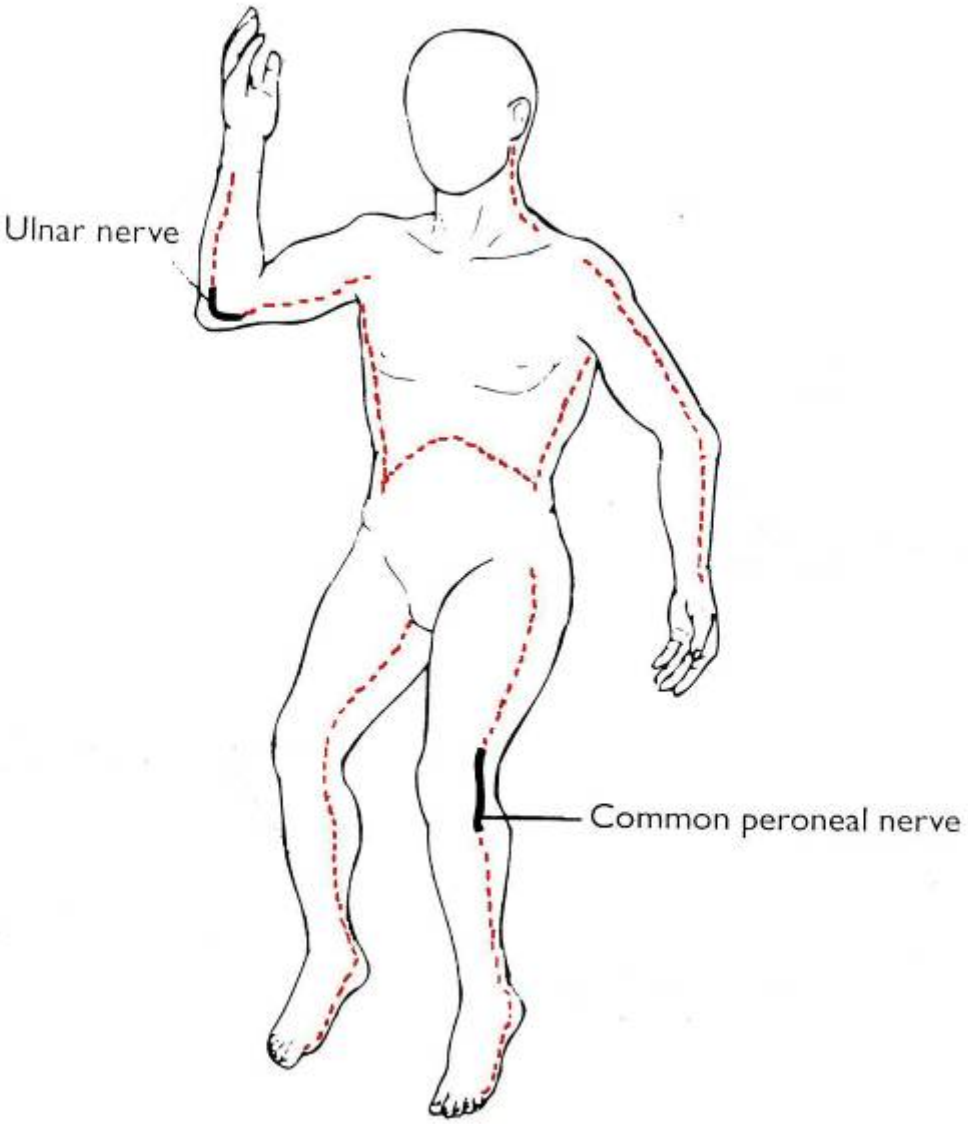
CAUTION: Identify and avoid important structures (see diagram next page)

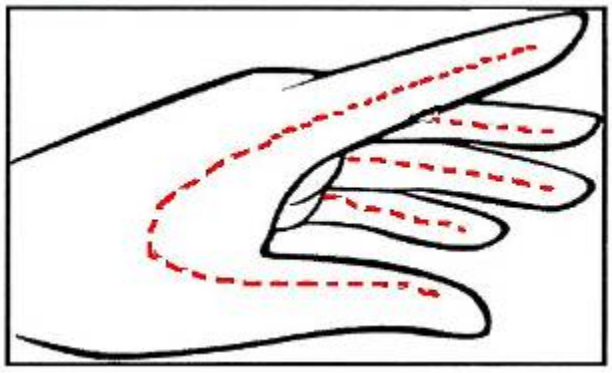
- Ensure incision is SKIN DEPTH ONLY
    - See fat not muscle at base of wound
- Ensure adequacy of release
    - No remaining tight bands – run finger along wound
    - Escharotomy extends above & below burn into unburnt skin (where possible) **(use local anaesthetic for the unburned skin)**
    - Monitor for return or preservation of circulation (limb), breathing (chest)
- Dress with
    - Alginate eg Algisite® or Kaltostat® (in escharotomy wound)
    - Vaseline gauze Bactigras® (over rest of burn wound but NOT CIRCUMFERENTIAL)
    - Loose Melonin® & crepe as outer dressing

POST ESCHAROTOMY CARE

- Continue MONITORING
    - Circulation (in a limb)
    - Breathing and ventilatory pressure (when chest involved)
- Elevate Limbs
- Continue Burn Care

Consultation with the relevant burns unit should always be made before embarking on escharotomy





Diagrams from ANZBA EMSB course