- Neurological disorders: 8 - 12 weeks
- Burns: extremely variable, depending on severity and social circumstances
- Joint replacement: 2 - 4 weeks
- Polytrauma: multiple fractures, particularly lower limb, require prolonged stay, often because of restrictions for weight bearing
- Amputations: 4 - 6 weeks
- SCI: paraplegia — average 12 weeks; quadriplegia — average 24 weeks.

What does therapy involve?

- Doctor: daily visits to monitor general medical problems (see below) and liaise with therapists.
- Physiotherapy: by specialised neuro-physiotherapists, also utilising a hydrotherapy pool.
- Occupational therapy: restoring function in all activities of daily living, assessing equipment needs, wheelchair mobility and work, and home visits.
- Speech therapy: particularly for CVAs where speech and/or swallowing is affected.
- Group and individual therapy: e.g. education for spinal patients with regard to all aspects of their condition.
- Social worker: support for disability grants, pensions, Commission for Occupational Injury and Disease (COID), Road Accident Fund (RAF) and all aspects of family and social support, including counselling.

Which complications commonly arise in patients undergoing rehabilitation?

- Uncontrolled hypertension and diabetes — mainly in CVAs.
- Pneumonia: particularly aspiration if dysphagia is present.
- Urine infections: most patients are admitted with urine catheters. SCI patients eventually perform self intermittent catheterisation or may have a suprapubic catheter.
- Deep-vein thrombosis and/or pulmonary embolus: all SCI patients are given anti-thrombotic prophylaxis for 3 months after injury. Joint replacement patients also receive similar prophylaxis until sufficiently mobile.
- Seizures: common after CVA, HI, polytrauma.
- Muscle spasms: extremely common after SCI and can also occur in CVA patients.
- Neuropathic pain: extremely common in SCI patients.
- Wound sepsis: after surgery.
- Pressure sores: SCI patients are not infrequently admitted with established sores which significantly delay full, active rehabilitation.
- Myositis ossificans: common after multiple fractures or prolonged hospitalisation, e.g. severe burns or sepsis.
- Depression and/or anxiety: present in most patients in the rehabilitation setting. Early treatment with antidepressants and counselling is essential.
- Autonomic dysreflexia: in 'high' paraplegia (above T6) and quadriplegia. Commonly caused by constipation, blocked catheter or sepsis. MUST be treated as an acute medical emergency.

What are the financial implications?

- Financial cover is generally available from:
  - COID
  - the mining industry
  - Road Accident Fund
  - some medical aids.
- The costs do not stop after the period of rehabilitation, but may continue for the life of the patient (e.g. in spinal injury).
- Government funding is extremely limited, and not generally available.

What role can the GP play after the patient is discharged?

- Ensure that the patient is seen regularly to monitor progress and actively prevent further complications.
- Be aware of the common complications (as listed) which are not confined to the period of rehabilitation.
- Do not hesitate to refer back to therapists for advice.
- Provide counselling and support for immediate family or carer. Refer to social worker or psychologist if necessary.
- Understand that patients who have spent many weeks or months in a hospital environment are anxious and will have lost self-confidence. A caring GP will be an enormous support to both the patient and the family.

Further reading

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SECURING INTERCOSTAL DRAINS IN TRAUMA SURGICAL PRACTICE — HOW I DO IT

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The insertion of intercostal drains is one of the most common procedures in trauma practice, frequently carried out by junior staff in the course of resuscitation, as an emergency procedure in an awake and often intoxicated and unco-operative patient. This makes the procedure somewhat different from drains placed in the operating room environment after a thoracotomy, or

the drainage of pleural effusions in controlled environments.

Very little has been written on the most appropriate methods of securing intercostal drains. A multicentre study showed that in the USA up to 25% of intercostal drains were placed and secured incorrectly, and it is common knowledge that tubes pull out inadvertently in everyday clinical practice.

In this article I describe one safe method for securing intercostal drains following an Advanced Trauma Life Support (ATLS)-based dissection and drain insertion, giving good cosmetic results, excellent seal and secure anchoring of the drain to the chest wall.

Equipment

- Suitable size intercostal drain (34 - 36G in adults), with large holes down to about 10 cm from its tip. NB — the trocar sometimes supplied is NEVER used!
- Standard thoracostomy set
- Two thick nylon sutures (1 or 0) on Colts needle
- Sterile dressings
- Underwater seal bottle.

Preparation

This will usually involve placement of an IV line, explaining the procedure to the patient, obtaining informed consent, cleaning and draping of the chosen area, normally the 5th intercostal space (just anterior to the mid-axillary line to avoid the long thoracic nerve) and well away from breast tissue.

- Local anaesthesia: 1% lignocaine with or without adrenaline which should reach skin and subcutaneous tissue at least 2 - 3 cm either side of the planned incision, intercostal muscles and periosteum (Fig. 1).
- Tissue dissection: Incision with a scalpel through skin and subcutaneous tissues, creation of a small flap with an artery forceps by entering the pleura immediately above the upper border of a rib, careful finger sweep in order to avoid injuring lung or other structures (Figs 2 and 3).

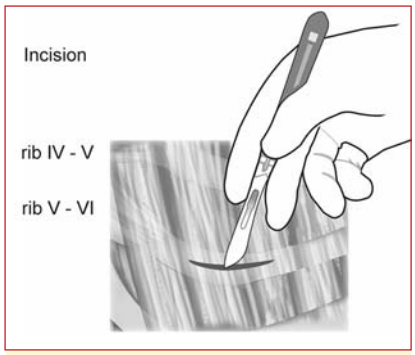

Fig. 1. Incision.

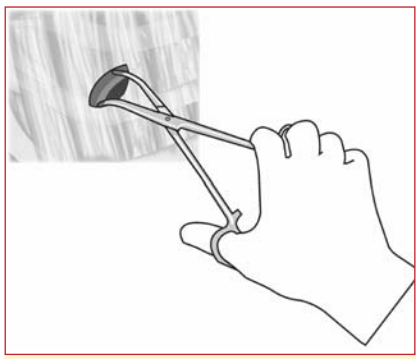

Fig. 2. Dissection.

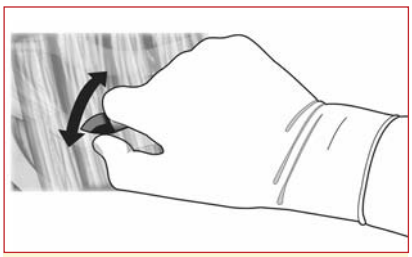

Fig. 3. Finger sweep.

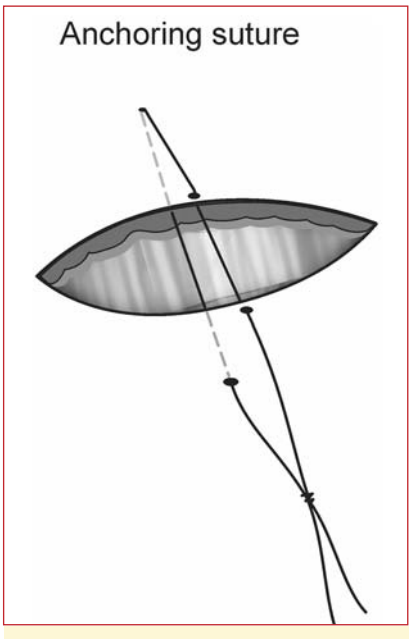

Fig. 4. Suture placement.

Suturing

- Place the main anchoring suture at this stage, before inserting the drain. The main suture can be safely inserted in the middle of the incision, offering better visualisation, avoiding the risk of catching the drain wall, and of sustaining needle-stick injury (Fig. 4).
- This main anchoring stitch is a vertical mattress suture, started inferiorly, and catching as much tissue as possible, often down to a rib, from about 2 - 3 cm away from the wound margin, and through the edge of the wound on the way back. The two ends of the suture are left to about 30 cm in length each.
- The chest tube is then inserted using a standard ATLS technique.
- A 'first throw' of the suture is placed and used to approximate the skin around the chest tube (Fig. 5).

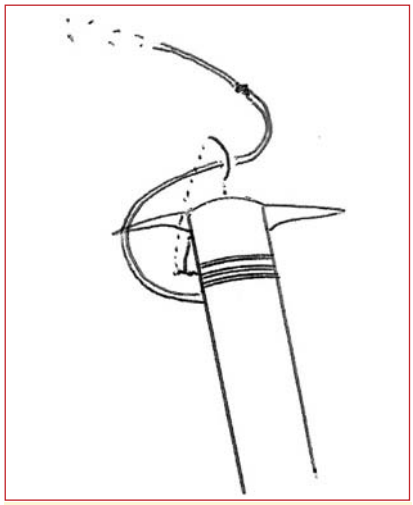

Fig. 5. Suture is placed under loop.

- The two ends of the suture are tied together 15 cm from the wound edge.
- The suture is wrapped tightly around the tube at skin level, until reaching the knot. The knot is then passed underneath the suture loop, leaving about 1 cm clear. The ends of the suture are then tied around the chest tube a few times, indenting it each time to retain it in place. As a result, any traction on the tube will tighten the hold on it.
- One or two vertical mattress sutures

are then applied to one or both ends of the wound to approximate it as any other linear incision and to avoid puckering (Fig. 6).

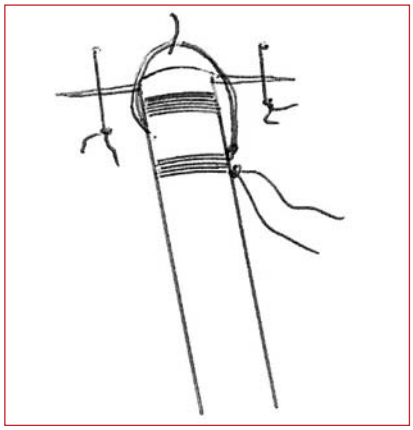

Fig. 6. Completed secure fastening.

For removal, the suture is cut just proximal to the knot. This will allow the anchoring stitch to be tied easily when the drain is removed.

Conclusion

Adequate anchoring of an intercostal drain is essential to avoid complications such as sepsis, patient discomfort, accidental dislodgement, creation of pneumothorax on removal, and unacceptable cosmetic results.

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TRAUMA IN PREGNANCY IN A NUTSHELL

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The risk to a fetus in pregnancy even in 'minor' or non-catastrophic trauma is still significant, with preterm labour occurring in 8%, abruption in 1% and fetal death in 1% of cases. In major trauma, the fetal death rate approaches 20%. Oxygen transport in the fetal placental unit is intimately tied to maternal blood flow. Because of the passive uptake of oxygen, fetal oxygenation is only as high as that in the uterine vein.

The patterns of injury to pregnant women differ slightly from those to non-pregnant women, with injuries to the abdomen more common than those to the head or chest. The ABCDE priorities of trauma management in pregnant patients are the same as those in non-pregnant patients.

Anatomical and physiological changes occur in pregnancy which are extremely important in the assessment of the pregnant trauma patient. These affect both the mother and the fetus.

Anatomical changes

- Size of the uterus gradually increases and it becomes more vulnerable to damage both by blunt and penetrating injury:
  - at 12 weeks of gestation the fundus is at the symphysis pubis
  - at 20 weeks it is at the umbilicus and
  - at 36 weeks at the xiphoid.
- At first the fetus is well protected by the thick-walled uterus and large amounts of amniotic fluid.

Physiological changes

- Increased tidal volume and respiratory alkalosis
- Increased heart rate
- 30% increased cardiac output
- Blood pressure usually 15 mmHg lower
- Blood volume higher than in the non-pregnant state
- Aortocaval compression in the third trimester with hypotension.

Pitfall

- Because the blood volume is higher, more bleeding will take place before shock intervenes. The volume of blood loss is commonly underestimated.
- Aortocaval compression must be prevented in resuscitation of the traumatised pregnant woman. If she is > 32 weeks pregnant, there is a danger of aortocaval compression and, if possible, she should be tilted in the left lateral position to prevent it.

Special issues in the traumatised pregnant patient

- Blunt trauma may lead to:
  - uterine irritability and premature labour
  - partial or complete rupture of the uterus
  - partial or complete placental separation (up to 48 hours after trauma)
  - severe blood loss potential with pelvic fractures.

It is not unusual in these patients, such is the severe mechanism of injury, for the equivalent of an entire blood volume to be lost. Unless this is anticipated, the resulting hypotension may result in the death of the fetus.

What are the priorities?

- Assessment of the mother according to the ABCDE.
- Resuscitation in left lateral position to avoid aortocaval compression.
- Vaginal examination (speculum) for vaginal bleeding and cervical dilatation.
- Marking of fundal height and palpation of tenderness.