

# VENESECTION INTRAVENOUS CATHETERISATION

Pages with reference to book, From 367 To 370

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These days a venesection is performed mainly for securing a route for intravenous fluid replacement and alimentation.

## **Difficulties may be encountered in:**

1. Selecting a site
2. Locating the vein
3. Selecting a 'tub'
4. Maintaining flow
5. Securing the catheter

## **Selecting the Site**

Veins in the upper limb are to be preferred for many reasons: the flow is better, the line is less likely to be displaced, it is more effectively nursed. However, veins in the upper limb may have been rendered unsuitable for I.V. catheterization by repeated punctures for I.V. injections and drawing blood. Under such circumstances a lower limb vein has to be used.

The three commonly used veins are the basilic and cephalic (in the upper limb) and the long saphenous at the ankle. Occasionally the long saphenous (in the thigh of infants) and the external jugular vein may be used.

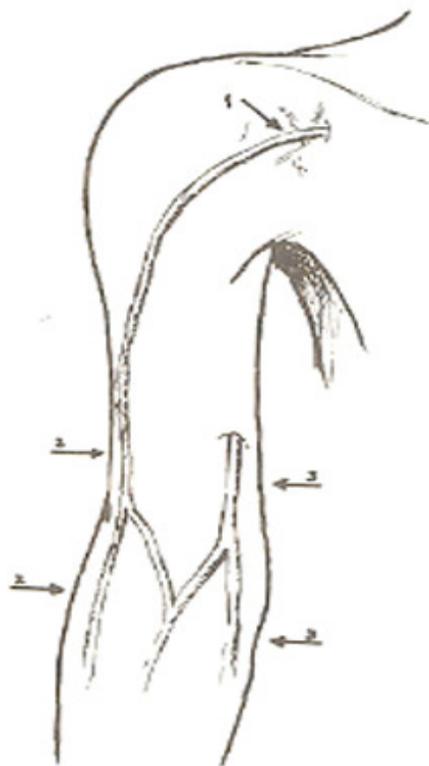
## **Locating the Vein**

This may be a problem in the collapsed, dark skinned, obese and oedematous patients.

The long saphenous may be located in the leg by palpating the anterior aspect of the medial malleolus, where a groove or depression is felt, in this lies the vein which in the elderly or shocked patient (due to venospasm) may feel like a cord and look like a tendon. However, no tendon crosses the medial malleolus in this location. The terminal branches of the saphenous nerve (sensory) lie with the vein over this part of the ankle and may be divided in scissor dissection, blunt dissection is therefore preferred.

The basilic vein may be located in the forearm at a point between the middle of the cubital fossa and medial epicondyle. This is a good vein to catheterize but because it lies in the crease of the elbow, kinking of the catheter and anchorage may be a problem.

The cephalic vein may be catheterized at one of three sites: (I) on the anterior aspect of forearm in the midline, 5 cms. below the elbow crease; (ii) on the lateral aspect of the upper arm if visible, and (iii) in the deltopectoral groove. This vein at the last two sites is not as a rule damaged by repeated puncture (Fig. 1).



1. The cephalic vein in the deltopectoral groove - a slender vein best catheterised where shown by the arrow though difficult to find, one of its many small tributaries may be followed to reach it.
2. The cephalic vein in the arm and forearm.
3. The basilic vein in the arm and forearm.

The saphenous vein on the medial malleolus blunt dissection advisable, to save the accompanying saphenous nerve.



Fig. 1. Cephalic Vein Catheterised at three sites.

The cephalic vein above and below the elbow crease lies in the superficial fascia just under the skin. In the deltopectoral groove it lies beneath the deep fascia which has to be incised for access.

**Selecting a 'tube'**

Two problems are encountered when catheters are to be selected, one of length and the other of diameter (internal/external). Unless catheterisation of a central vein is the aim, lengthy catheters should be avoided since they only increase resistance to flow. It is rarely possible to insert the catheter more than 20 cms. in the long saphenous vein.

Catheters of the largest possible external diameter that will comfortably enter the vein selected should be chosen. All other factors being constant doubling the diameter of the catheter increases flow 15 times. By contrast, doubling the head of pressure increases the flow only 5 times.

In adults, catheters of 14 or 16G are appropriate whereas catheters of 18G calibre or less are inadequate when rapid fluid replacement for resuscitation is required.

P.V.C. Paediatric Feeding tubes in sterile packs are a good substitute for true I.V. catheters. Sizes 7, 6, & 5 Fr (Kawasumi, JMS) are adequate in terms of ease of insertion and providing a good flow-rate.

**Items required in the form of a prepared tray (Sterilised)**

1. Waterproof sheet (Mackintosh) as an underlay.
2. 4 operating drapes (medium size)
3. 2% Lignocaine and distilled water, for dilution (preparations with adrenaline are unsuitable).
4. 2.5 or 5 ml disposable syringe with 25 G needle.
5. Scalpel-two, or one with two blades 11 and 25.
6. Catgut plain 3/0 - one tube.
7. Silk 4/0-one tube/pkt
8. Fine dissecting forceps: toothed - 1 non-toothed -1
9. Mosquito haemostat curved - 1 straight - 1
10. Needle holder - 1
11. Retractors - one self retaining or 2 hook type.

**Procedure:**

- Scrub hands thoroughly with detergent and water for five minutes. Use a brush for nails. Clean the skin of the patient over the

selected site thoroughly with detergent and water, then with iodine and alcohol.

- Place the Macintosh covered with a sterile towel under the limb, proceed to drape the limb using three towels as shown in Fig; 2

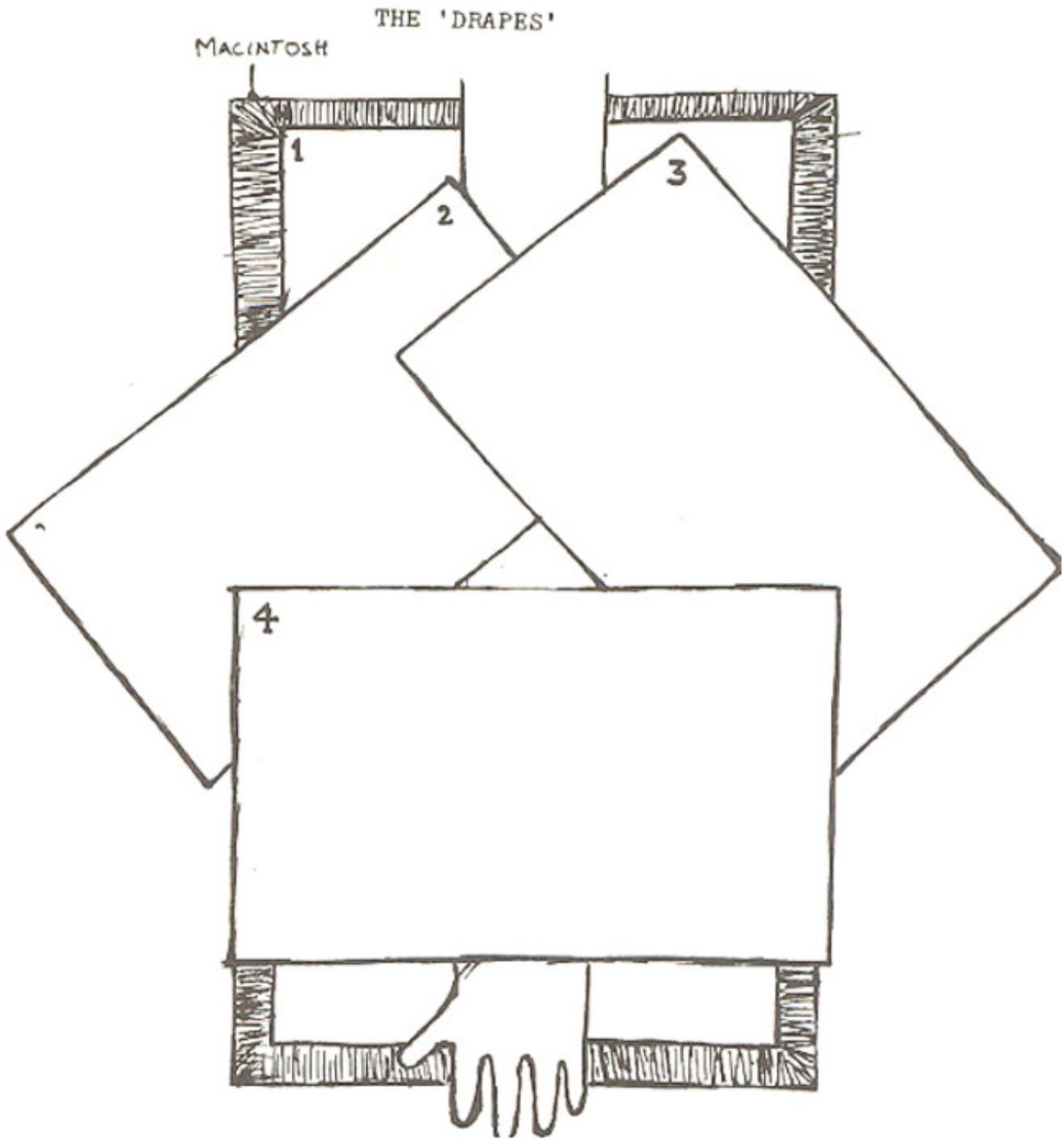


Fig.2. The Drapes.

Infiltrate the skin overlying the proposed incision site with 0.5 to 1 ml of 0.5% lignocaine (mix 1 part of 2% lignocaine with 3 parts distilled water) using a 25G needle. Prime the selected catheter after having connected it to the infusion system and keep it in readiness in its sterile cover.

- Make a small transverse (2 cm) skin incision over the vein - do not cut down too deeply.
- By gentle blunt dissection free the vein from surrounding tissues, it may appear tendon like by the time it is isolated. Do not clamp or hold the vein in the jaws of a haemostat or dissecting forceps.

- Secure the distal most end of the vein by a 3/0 plain catgut ligature. Tie securely, leave ends of tie long and hold in a haemostat. This action prevents troublesome haemorrhage into the field and allows traction to be applied to the vein.
- Using a # 11 (B.P.) scalpel blade make a transverse venotomy as shown in Fig: 3

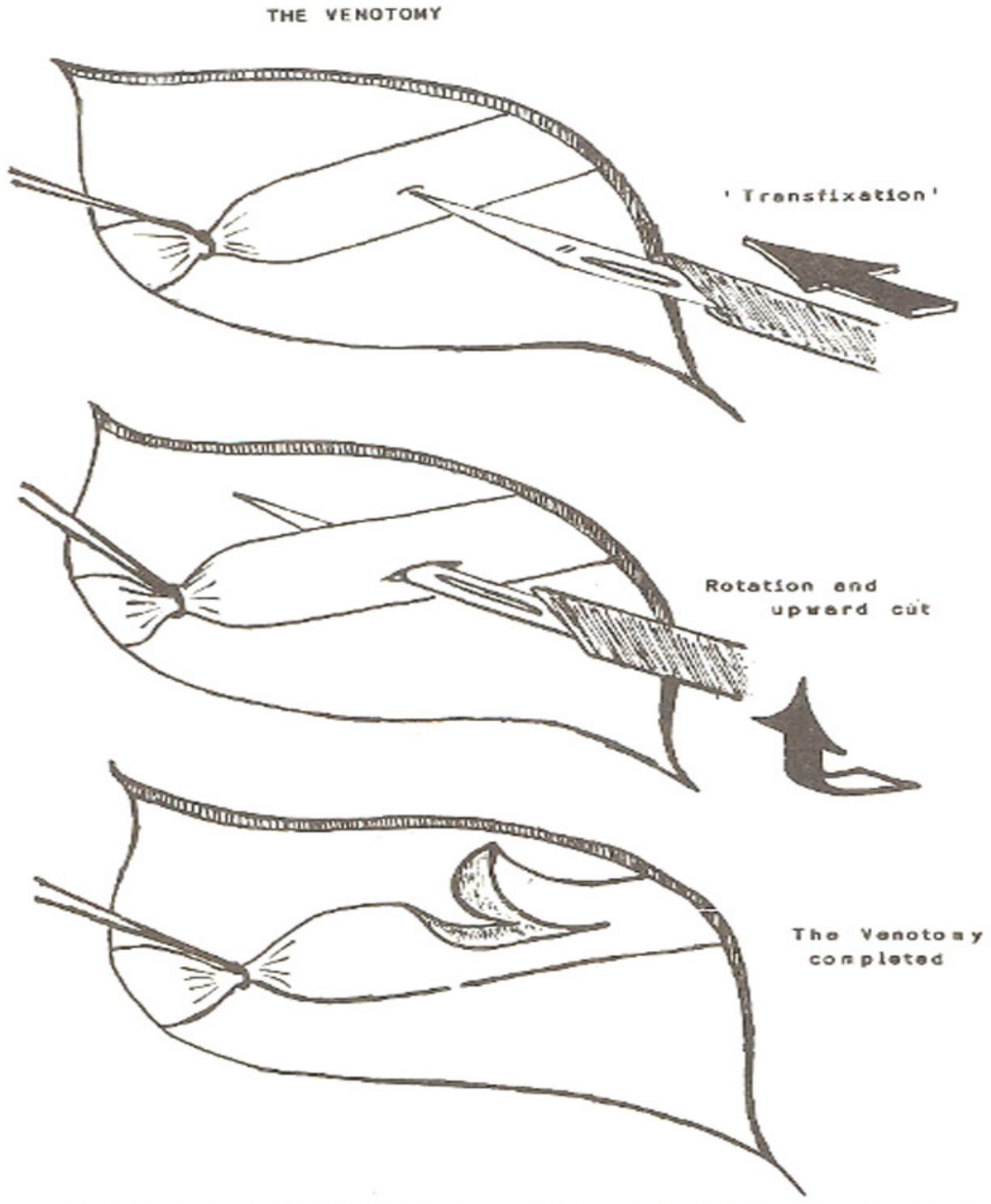


Fig.3. The venotomy.

The closed tip of a fine haemostat may be used to dilate the lumen of vein if it is in spasm.

- The tip of the feeding tube or plain catheter may be bevelled by cutting across it with a sharp scissor in order to facilitate passage.

- As the catheter is being inserted, the infusion fluid should be allowed to run into the vein. If passage of the catheter into the vein or flow of fluid is arrested, withdraw the catheter a centimeter or two until good flow is established. Application of local heat (with a hot water bottle) helps to overcome venospasm in those in shock.

- Tie a second ligature (3/0 plain catgut) over the proximal part of the vein with the catheter in situ. Close the wound with 2 or 3 fine skin sutures (4/0 silk).

- Cover wound with antibiotic ointment and an occlusive dressing.

### **Securing the Catheter**

If the site of catheterisation is near a joint, secure the tubing to the proximal part of the limb rather than the distal. - Such anchorage would prevent displacement of the cannula much more surely in case of movement. (Fig. 4).

## THE PROXIMAL ANCHORAGE

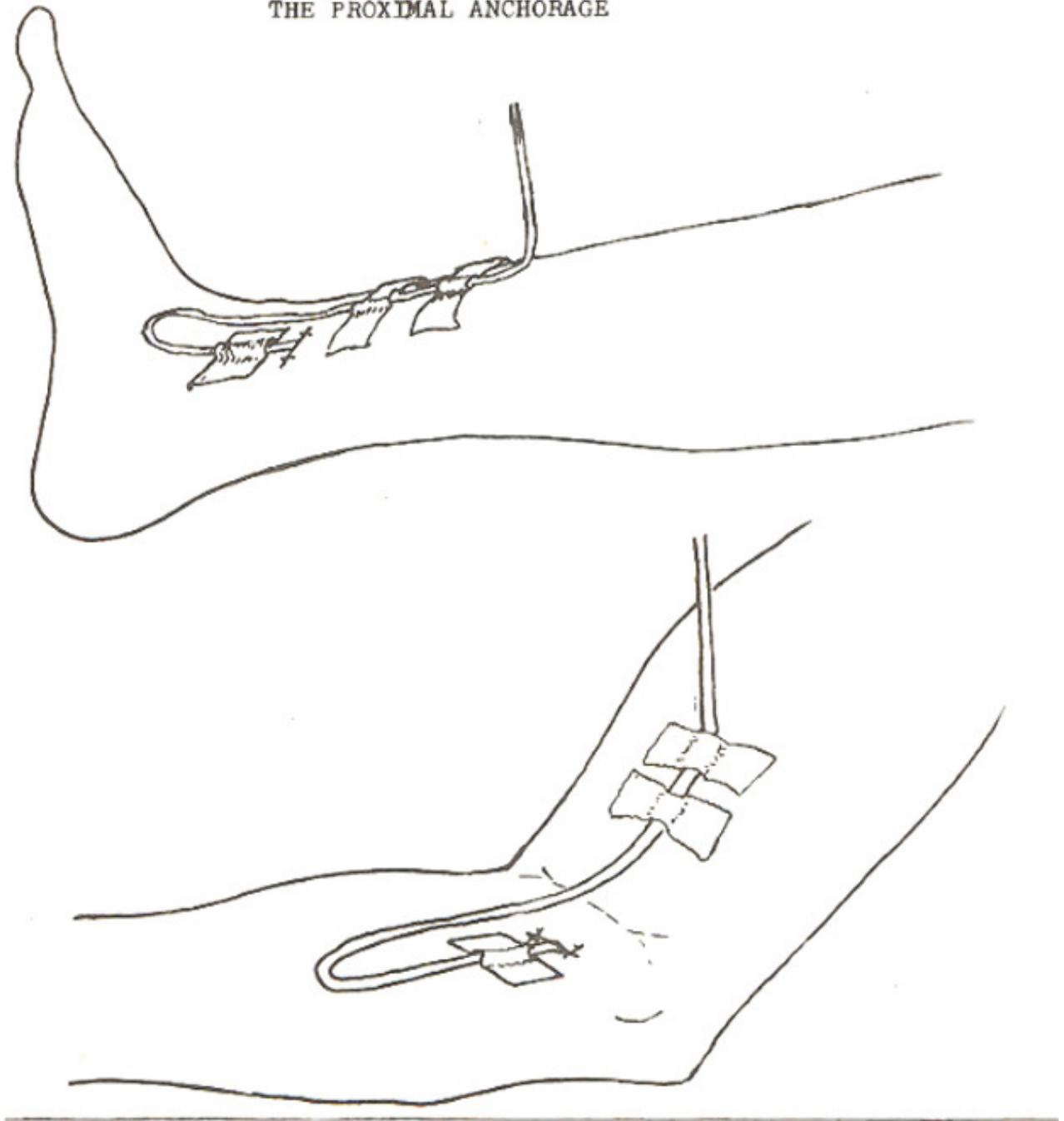
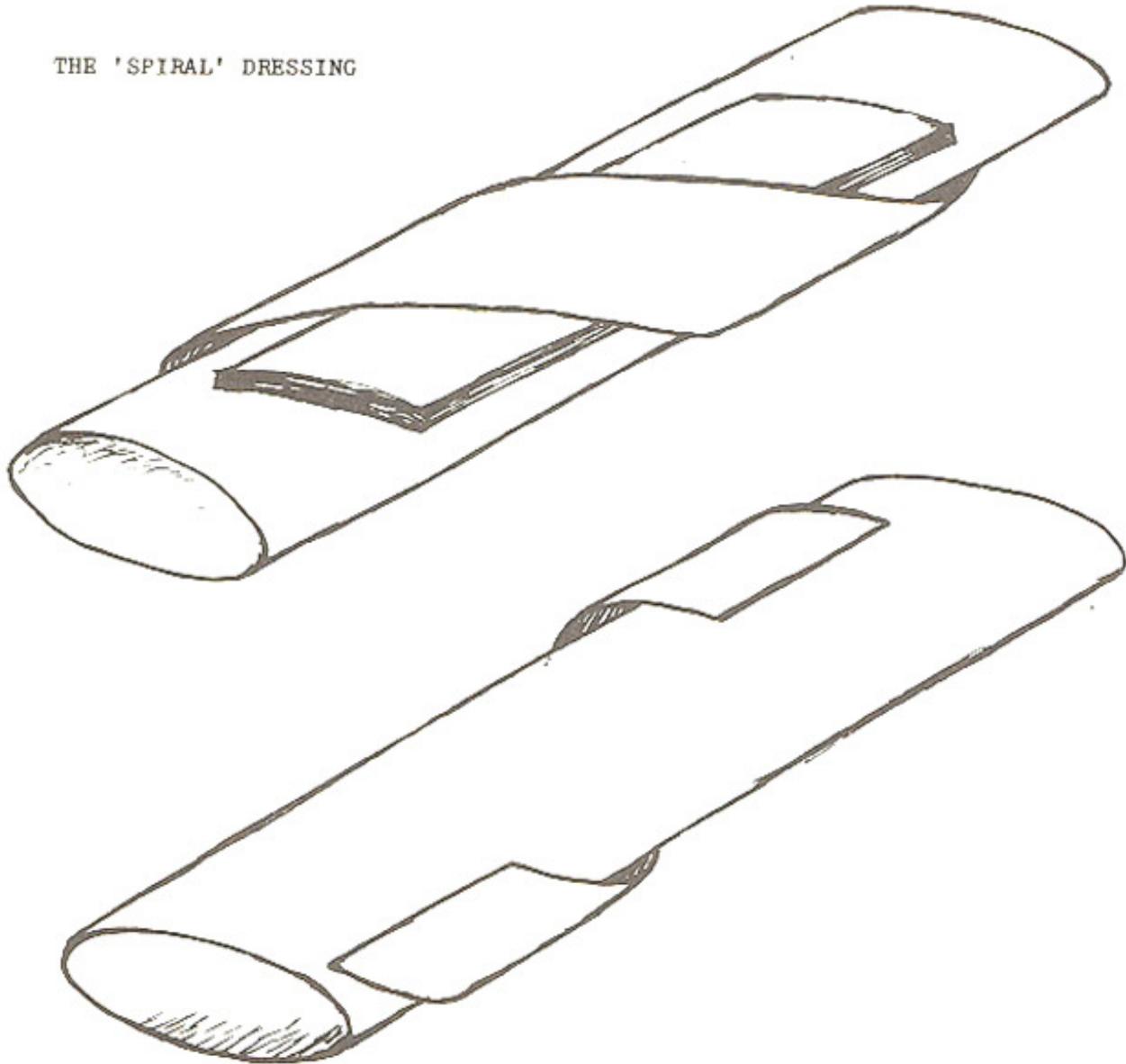


Fig. 4. The proximal anchorage.

When securing dressings or the line do not use strips of plaster that encircle the limb completely. Large strips of adhesive plaster should be applied in a spiral manner (Fig: 5).

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THE 'SPIRAL' DRESSING



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Fig. 5. The Spiral Dressing

This provides good anchorage without the possible 'tourniquet effect' of an encircling dressing.

**After care**

Eliminate all unnecessary connections between the drip chamber and the I.V. tube. This will reduce chances of the system being subject to faults (air/fluid leaks, contamination and disconnections).

Explain the importance of the line to the nursing staff to ensure their interest in its care. Give specific instructions regarding:

- \* Drops/minute to be given and total amount of fluid to be administered.
- \* Manner in which infusions are to be connected or disconnected from the system.
- \* Junctions which are not to or tampered with. be disconnected
- \* Insist on a high standard of hygiene and disallow casual and unsupervised use of the line for I.V. injection. Do not allow injections to be given through rubber junctions insist on the use of threeway

taps, capping them securely after use.

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**Every 12 hours:**

\* observe and palpate the course of the vein for redness or tenderness (phlebitis) indicating need for removal of the catheter.

\* insist on careful and supervised use of patient's muscles and joints to cannulation

**Every 24 hours:**

\* change dressing apply antibiotic ointment/ powder.

\* change infusion set (tubing, chamber, connections).