

How to place a pig-tail seldinger chest drain

Yorkshire & Humber Neonatal ODN

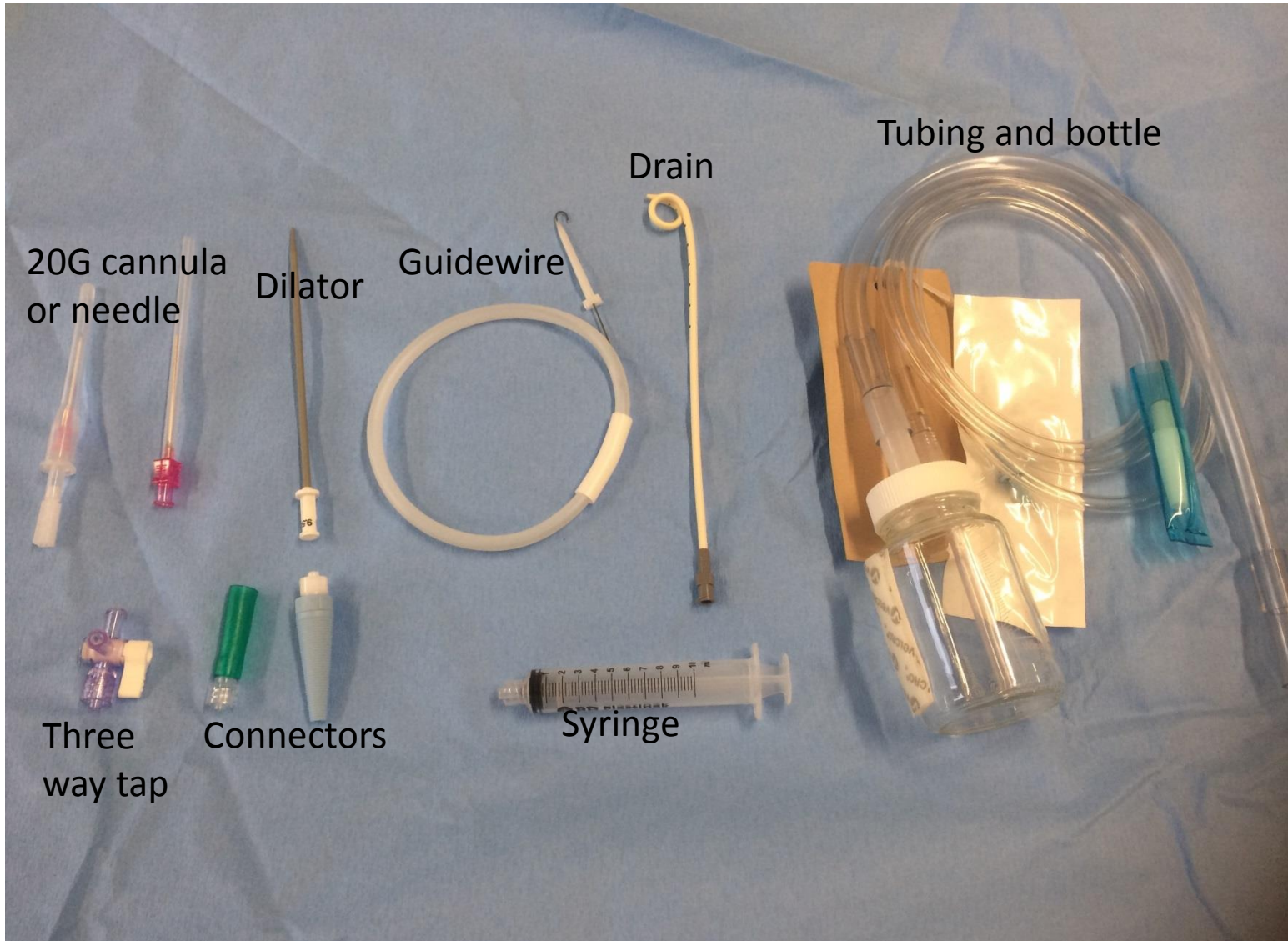
Based on previous NTNN procedure from Dr L
Pilling

Contents

- Equipment required
- Analgesia
- Identify insertion site
- Insert needle/cannula introducer
- Advance guidewire
- Dilate skin entry port
- Insert drain
- Attach
- Secure
- How to remove
- Acknowledgments

Equipment required

remember additional needles (25G & drawing up needle) and syringe for lignocaine



Fully sterile
assistant



Analgesia

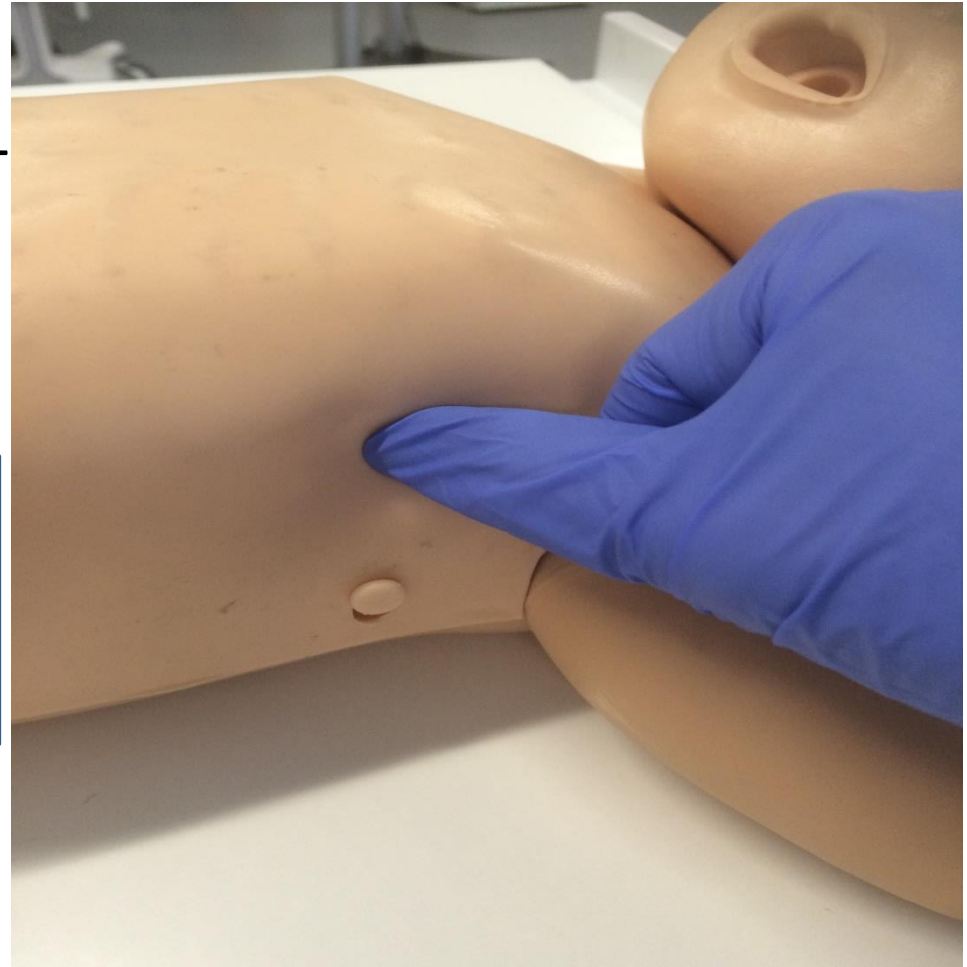
- Ensure baby is continuously monitored
- Ensure baby has adequate analgesia
- Use local anaesthetic (usually lignocaine)
- If ventilated a morphine bolus may be given
- If not ventilated low dose morphine or fentanyl (watch for chest wall rigidity) may be used

Positioning

- The baby should lay supine
- Place the arm on the affected side above the head
- Turn the face away from the affected side

Strict asepsis & identify insertion site

- Full asepsis should be used: gown and gloves +/- hat & mask – as per local policy
- Identify site, usually
4-5th intercostal space, just above 5th rib (to avoid neurovascular bundle), mid axillary line*.
- Clean skin according to local procedures and infiltrate with anaesthetic



* Sometimes mid-clavicular line may be preferred

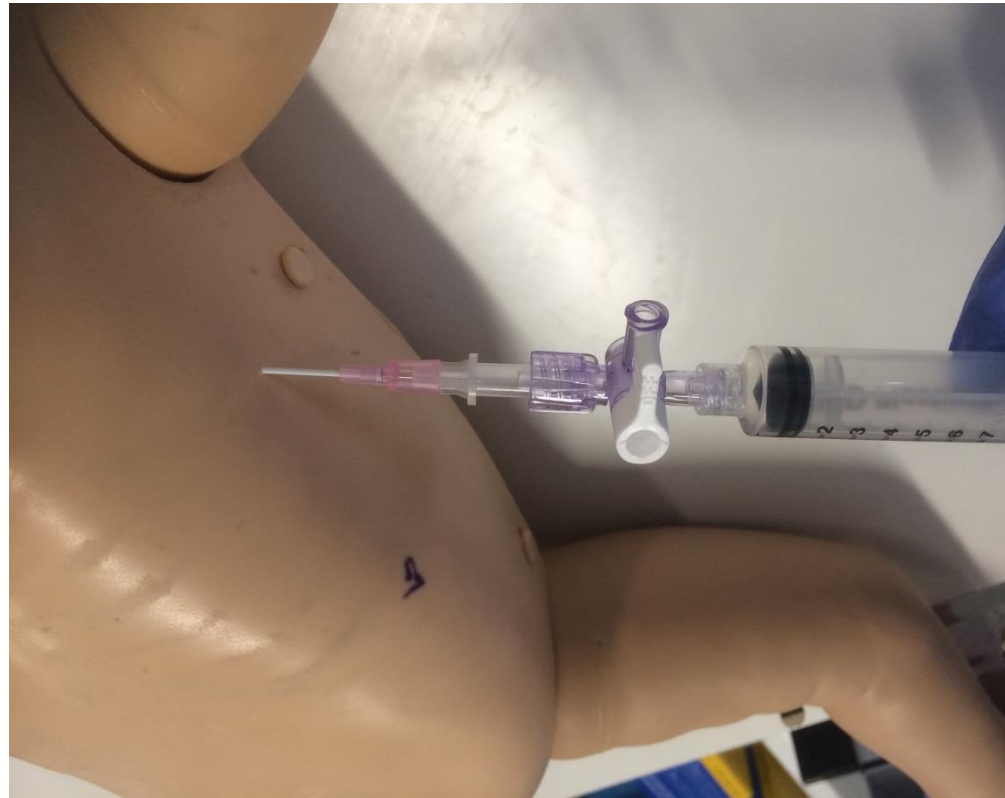
Needle or cannula?

- A 20G needle is available to use.
- A pink 20G cannula may be used instead.
 - The benefit being that once the soft tissues are breached the sharp needle may be slightly withdrawn, ensuring the underlying structures (lung, heart) are not damaged when advancing the device into the pleural space.



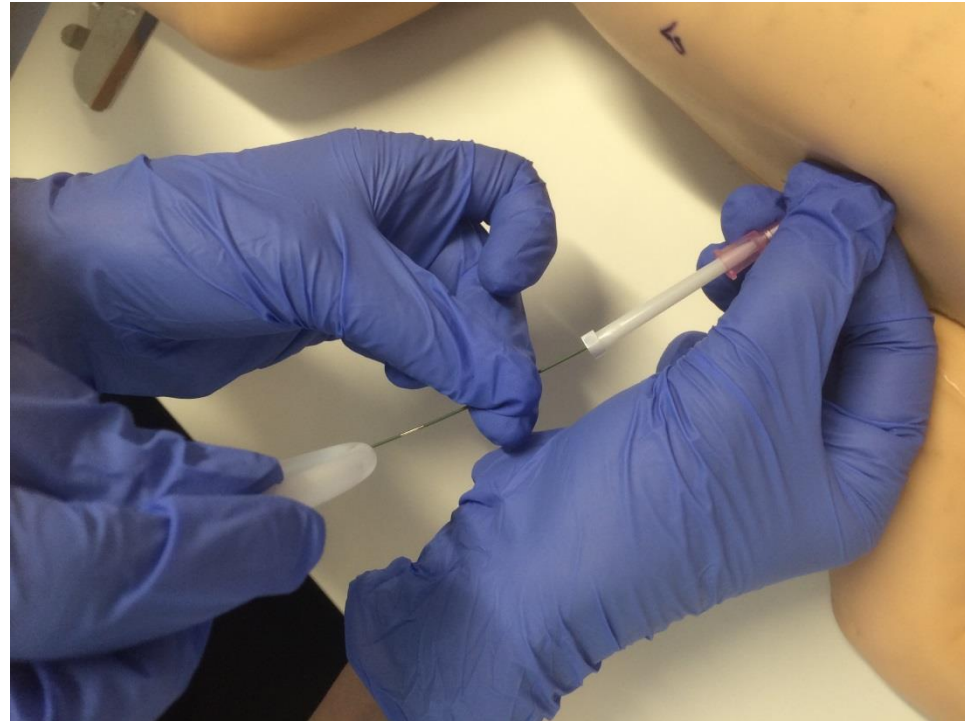
Advancing the needle/cannula

- Attach the three way tap and syringe to the end of the needle or cannula. Filling the syringe with 0.9% sodium chloride may aid seeing bubbles
- Advance through chest wall, aspirating the needle as you advance into the pleural space.
- This may be less than 1cm in preterm babies



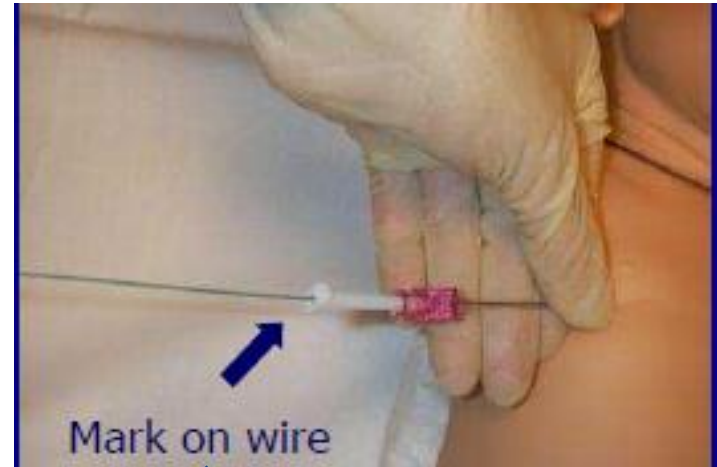
Insert the guidewire

- Once in the pleural space (air will be easily aspirated), remove the three way tap and syringe
- If using a cannula, hold the outer plastic cannula securely in place & withdraw the needle
- Using your assistant, insert the guidewire introducer into the end of the needle/cannula
- Advance the guidewire into the pleural space
- There should be little resistance



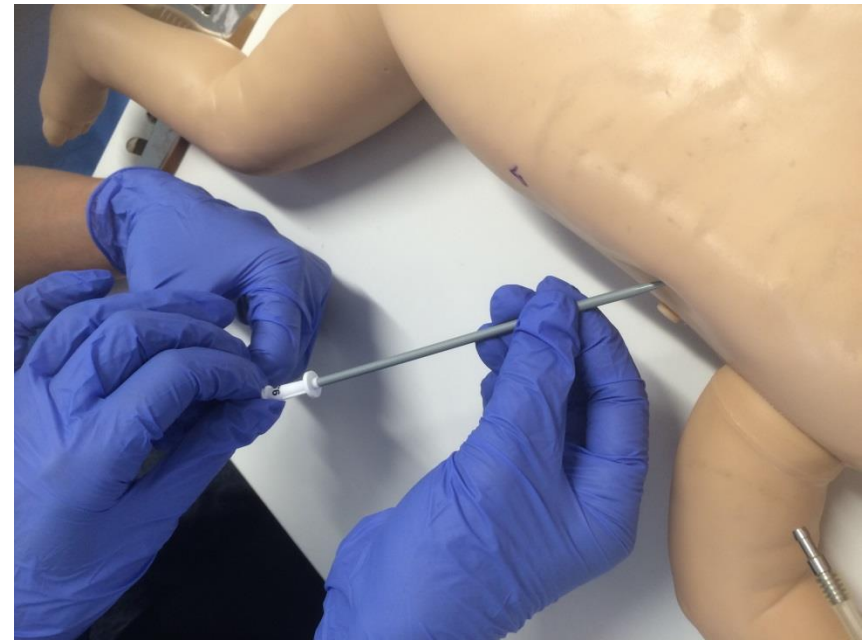
Advance guidewire

- Advance the guidewire to the mark on the wire
- Remove the cannula/needle, ensuring the guidewire remains in place and does not move
- Use assistant to hold the guidewire in place and “control” it



Stretch the soft tissues

- Using the assistant, pass the dilator over the guidewire
- Advance ~1cm through the skin to stretch the entry port for the drain.
- The skin may require a small incision to help
- Aim anteriorly
- The dilator can then be removed (wire remains in place)

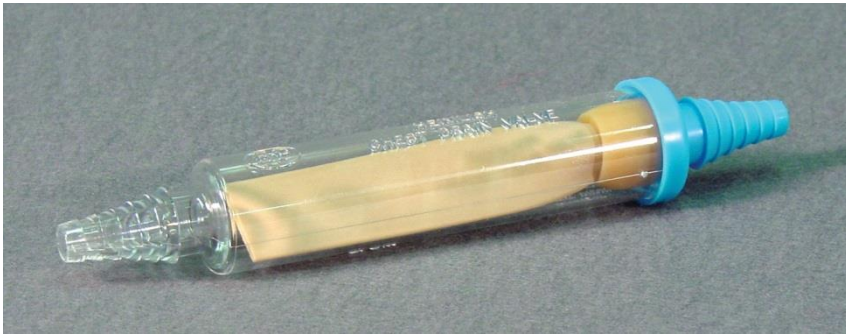


Insert the drain

- Advance the drain over the wire (usually requires assistant)
- Advance the drain to at least the first black mark
- Holding the drain in place, remove the wire



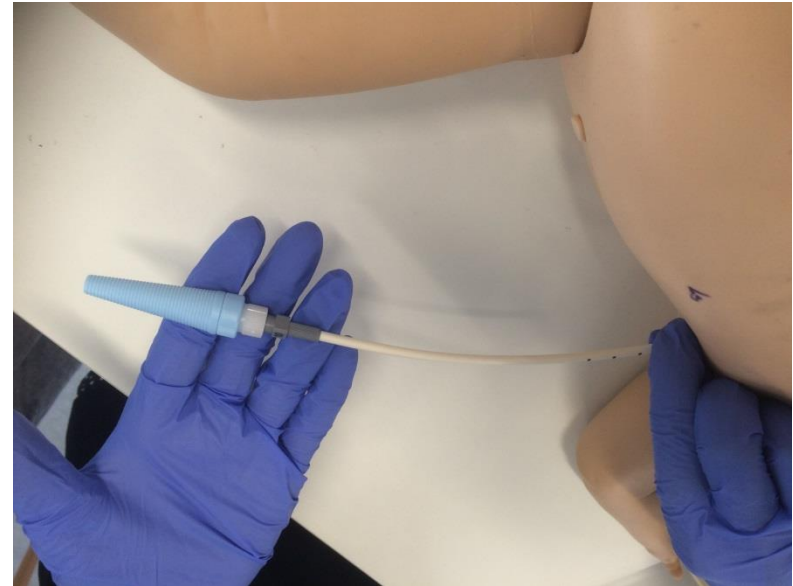
Flutter valve or bottle and tubing?



- The bottle should be filled to the line with sterile water and kept upright.

Attaching a flutter valve

- Attach the blue connector to the end of the drain. The flutter valve is clearly labelled as to which end to attach.

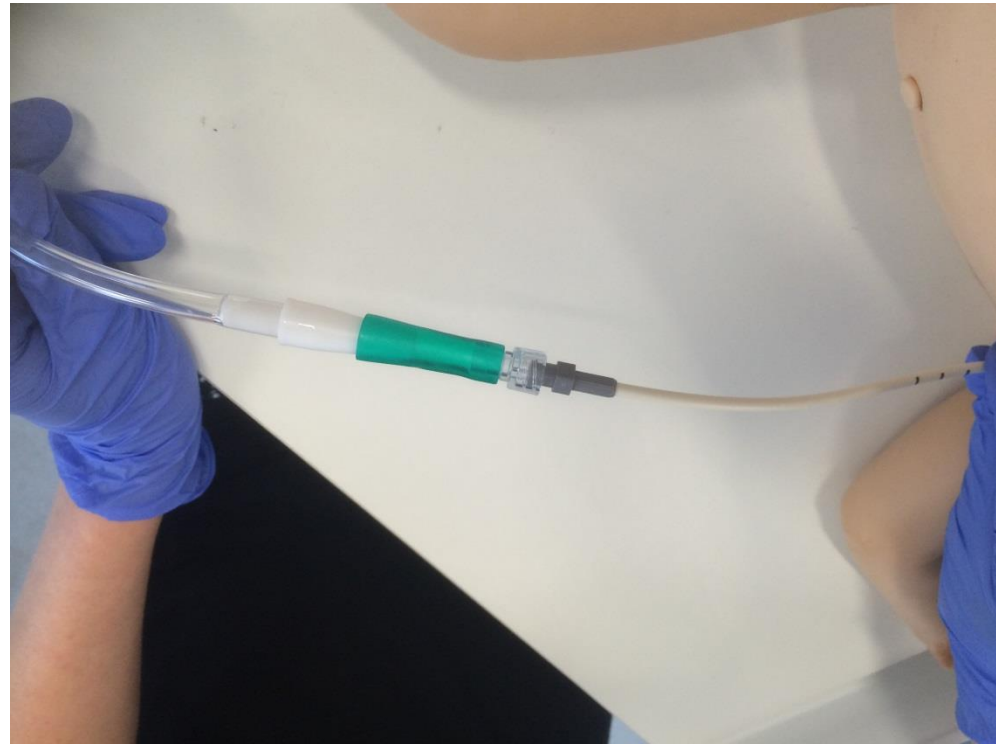


- Attach three way tap, extension tubing and flutter valve to drain



Attaching a drainage bottle

- Attach the green connector to the end of the chest drain
- Attach to tubing and bottle.
- Bottle **must** be kept below the patient at all times
- Attach 5-10cm H₂O suction if using



Securing the drain

- Sutures are not usually necessary
- “Sandwich” the drain between two pieces of Tegaderm
- If necessary a suture through the skin and tied around the drain may be used
- Do not use a purse string suture
 - this is unnecessary and may leave a scar
- If using tubing and drain, use forceps or tape to secure tubing to bed and the bottle to the incubator (to maintain in upright position)

Important points

- **Bubbling**

- Bubbling of air through the water in the bottle should be seen when the patient exhales.
- Continuous bubbling may indicate a leak in the system and it should be checked for disconnection.

- **Swinging**

- Swinging of the water level in the seal chamber will rise and fall as the pneumothorax resolves.
- This will diminish as the pneumothorax resolves.
- Sudden loss of swinging may indicate blockage or kinking of the tube and should be looked for.

Removing the drain

- Leave drain in situ for 24 hours after bubbling has stopped
- Consider clamping the drain using artery forceps for 4-6 hours. If transparent tubing filled with static serous fluid clamping may not be necessary. Consider re-x-ray (earlier if symptomatic). If there is no reaccumulation then proceed to removal.
- Gather equipment:
 - sterile pack,
 - sterile gloves,
 - Steristrips,
 - Tegaderm.
- Clean the area, gently removing the Tegaderm.
- Remove the drain, immediately occluding the incision site (send tip for M,C and S)
- Close entry site with Steristrips, applying Tegaderm over this
- Re-x-ray after 2 hours unless clinical deterioration before.