

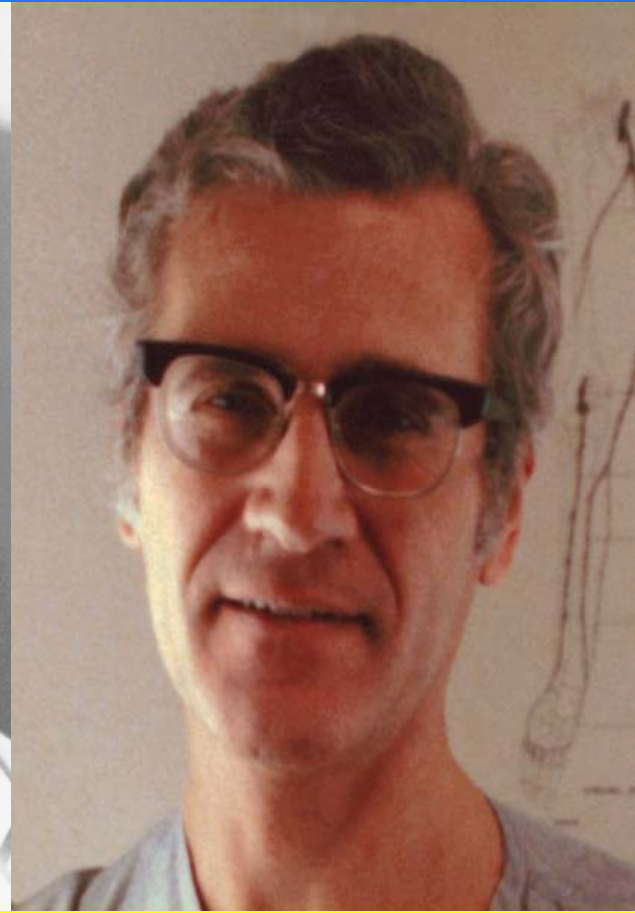
Transcatheter Fluid Drainage



A. Lunderquist



E. Ring



C. Cope

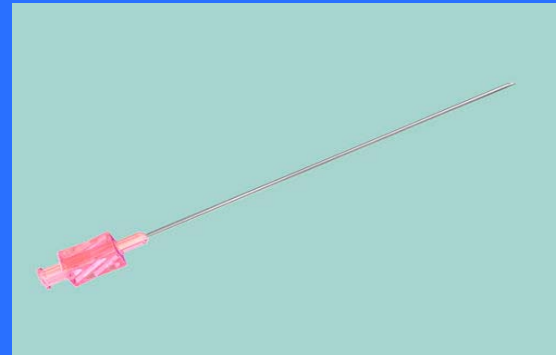
Dr Pankaj Sharma
Delhi State Cancer Institutes

Interventional Radiology

A subspecialty which provides minimally invasive techniques with the help of imaging modalities to diagnose or treat a condition.

All types of simple and complex collections drained in the chest, abdomen and pelvis

Requires ability to assess CT and US images and familiarity with drainage equipment

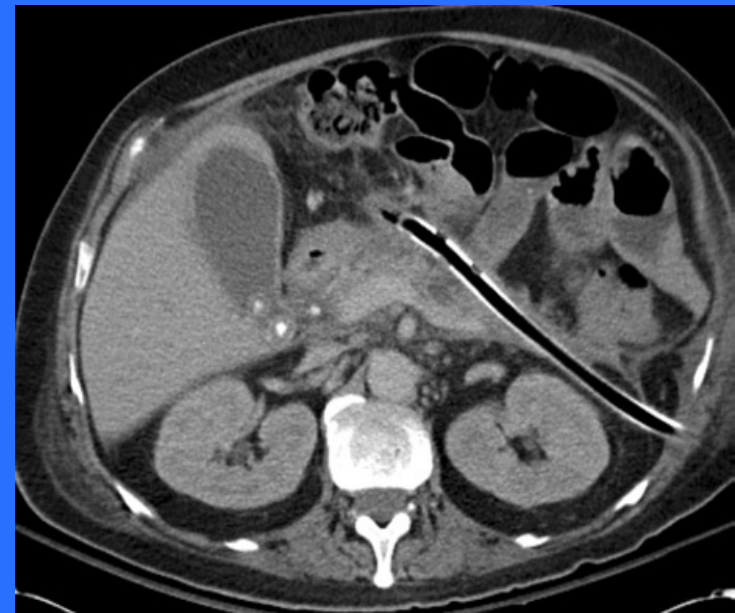
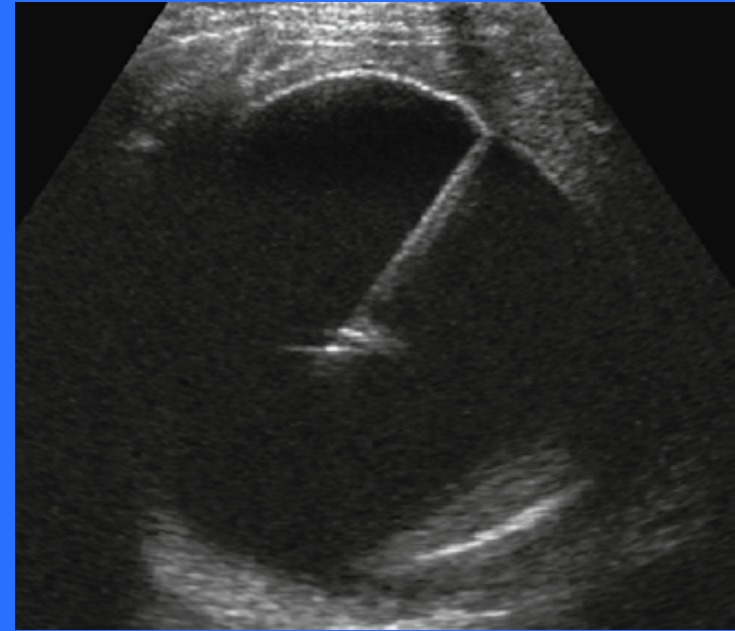


Imaging : USG or CT

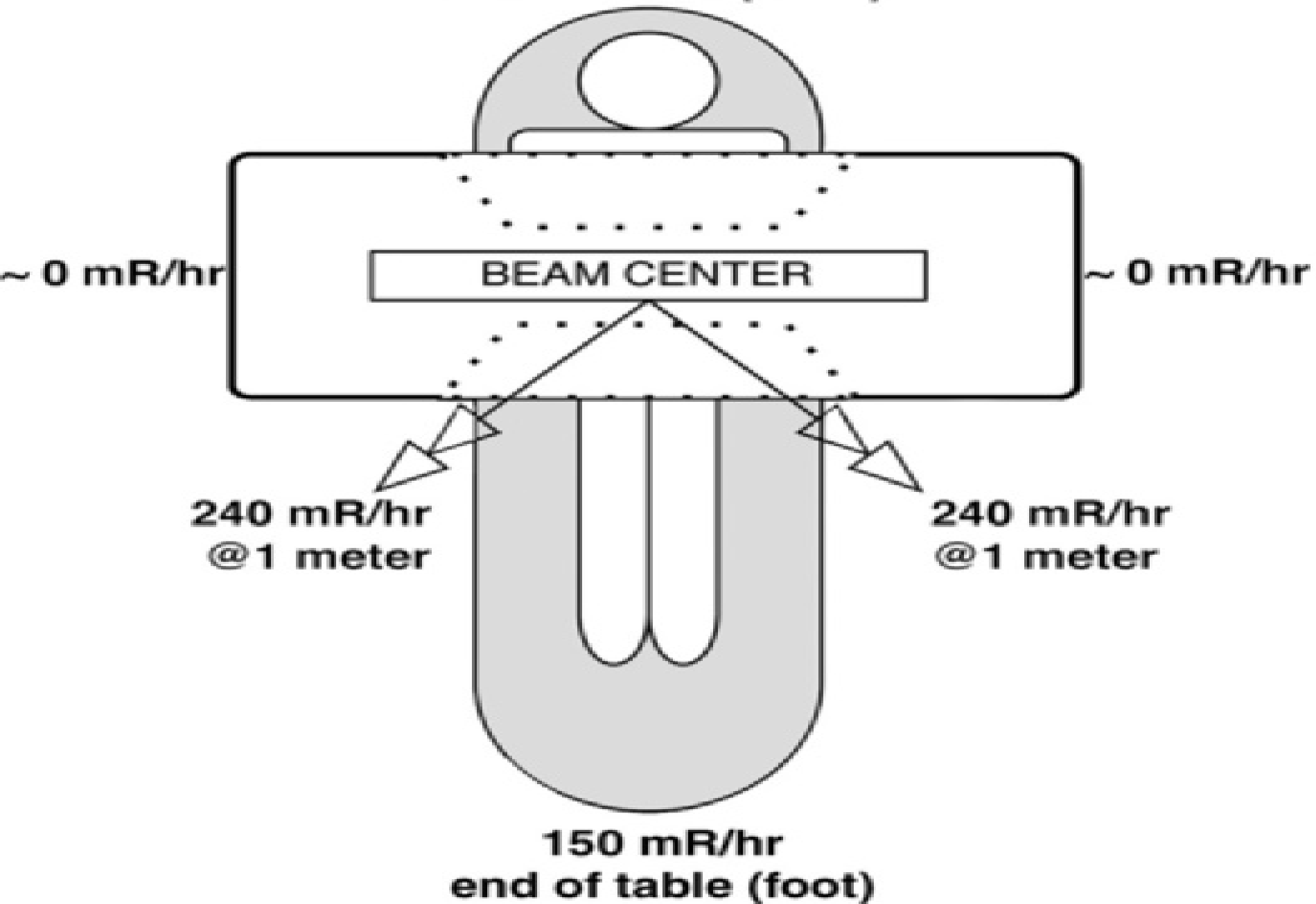
USG - real time
portable
operator dependent

CT- good visualisation
opacified bowel
not limited by ileus or
depth

Size + site of collection;
operator preference

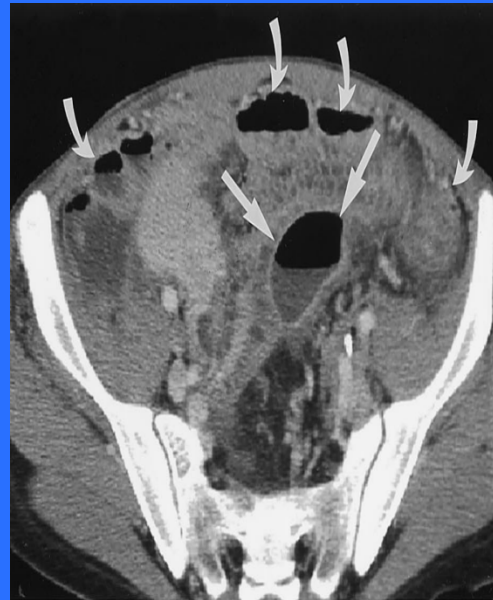
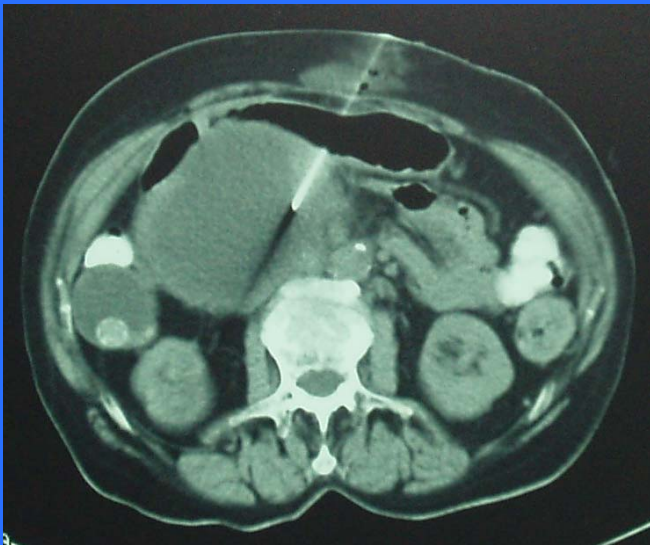


440 mR/hr
end of table (head)



Collection assessment : Imaging

- Aim- shortest, safest route to site drain in the most dependent position
- Avoid major vessels
- Avoid transgressing bowel
- Assessment of nature of fluid echogenicity; septations



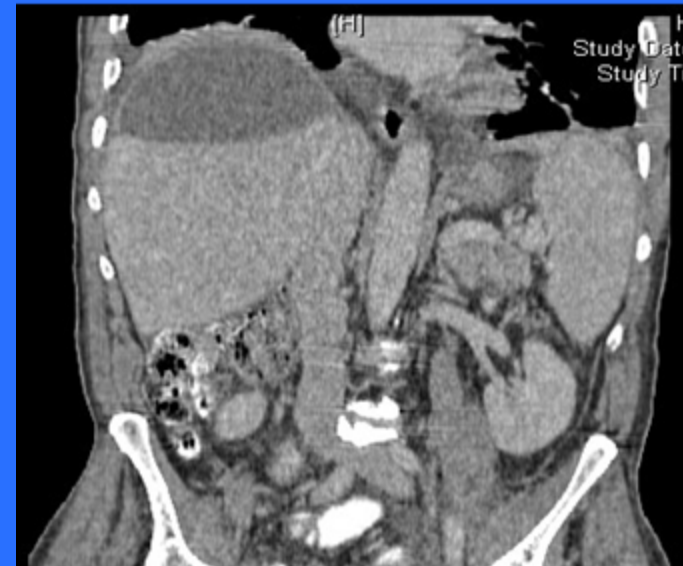
a.



b.

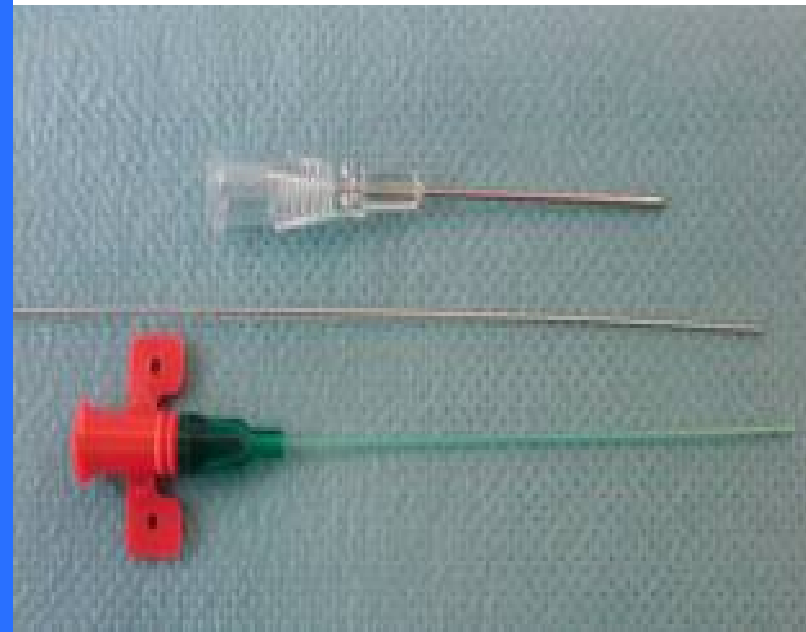
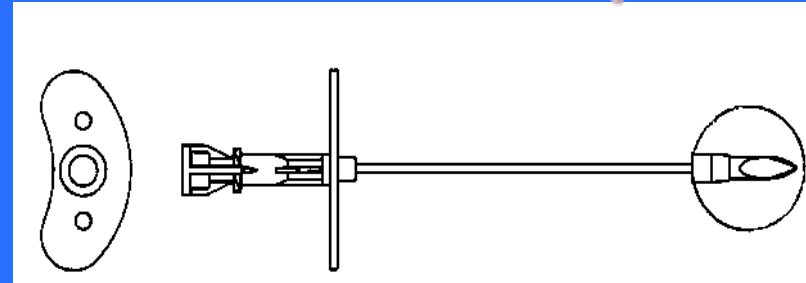
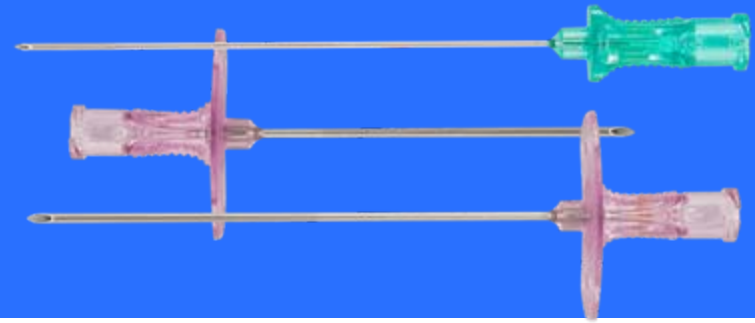
Subphrenic Abscess Drainage

- Traditional to use an extrapleural approach
- Pleural reflections-12th rib posteriorly;10th rib laterally;8th rib anteriorly
- Anterior subcostal approach recommended
- Lowest possible intercostal approach used-no empyema due to pleural adhesions



Access Needle

- Typical access needle has a sharp, beveled distal edge.
- Seldinger needle.
- 18 G single use, sterile needle.
- 2 parts-- a solid inner needle (stylet) & an outer thin wall needle for smooth passage.
- winged handle---good control.



Guidewires

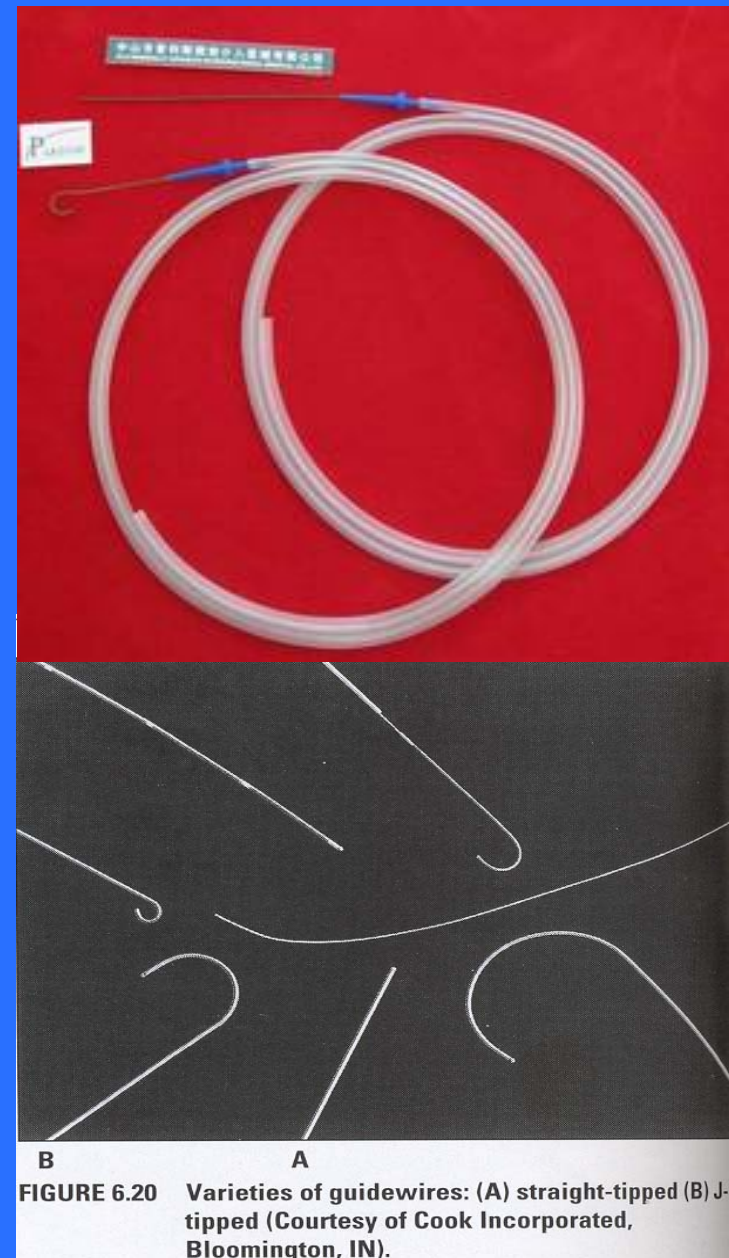
Ideal wire - stiff enough to allow passage of dilators and catheter but will coil within abscess and not perforate posterior wall.

Made of stainless steel.

An inner core wire that is tapered at the end to a soft flexible tip.

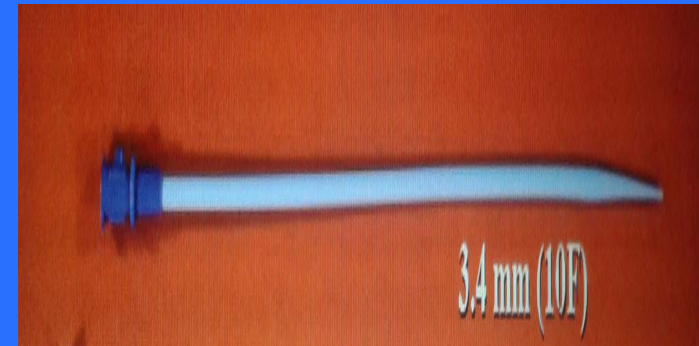
Tips at the end of GW

- Straight
- J- tipped



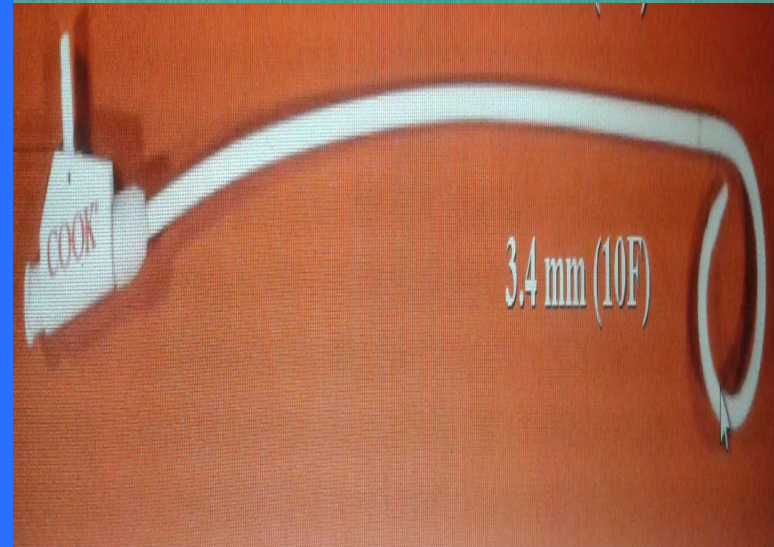
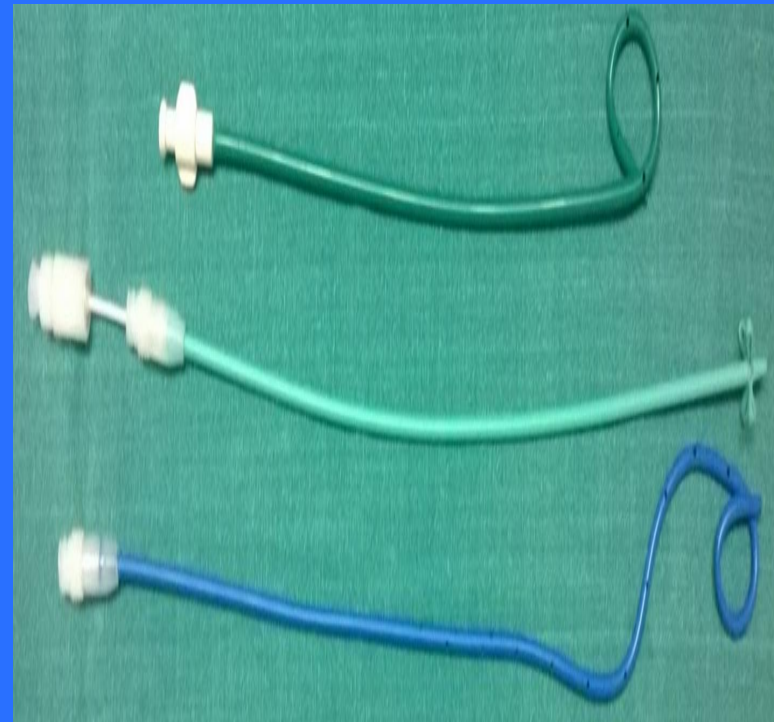
Dilators

Short stiff tapered plastic catheters which are used to spread the soft tissue/fascia so as to facilitate the sequential passage of a catheter.



Catheters

- A typical catheter consists of
of following parts :
 - Tip : the distal tapered part
 - Shaft : the long tubing
 - Hub : the proximal part with a plastic funnel for ease of guidewire insertions and attachment of syringes for contrast injection.
- 3Fr=1mm.



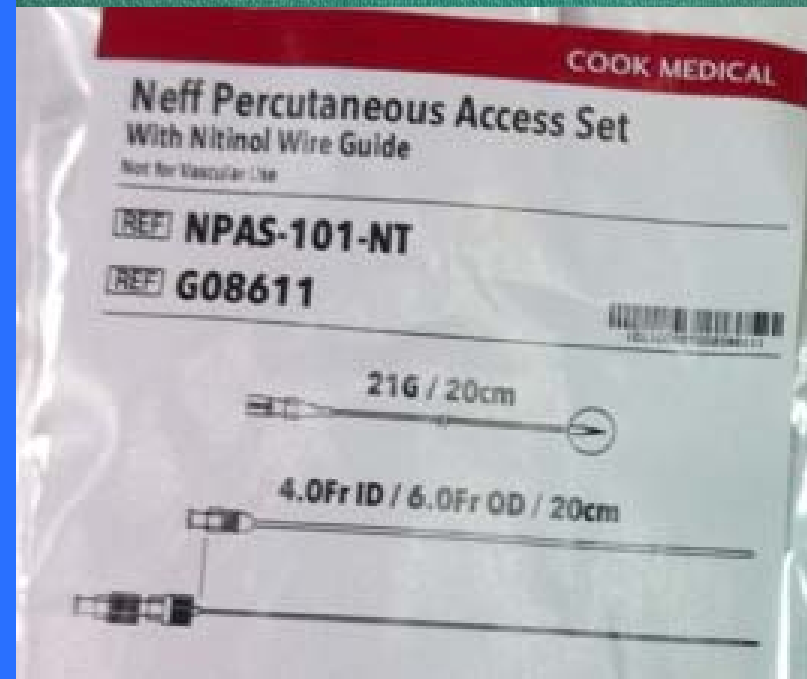
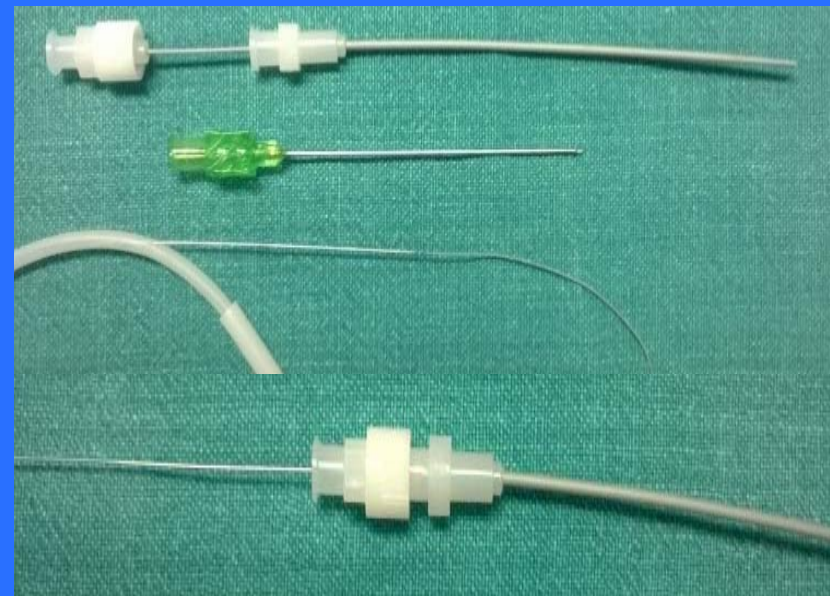
Catheter selection and Insertion

- Bore size – Thickness of fluid (as on C.T)
 - 14-16 Fr to 36 Fr
- Multiple side holes, maximum should be in the collection
- Seldinger technique
- Irrigated daily



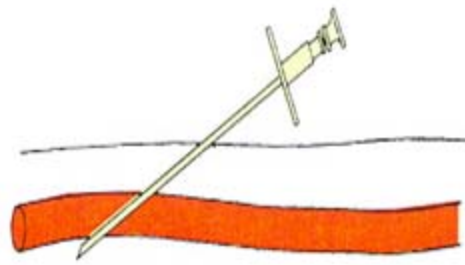
Micropuncture Set

- 21G needle used to puncture the vessel.
- 0.018 inch guidewire.
- Co-axial dilator system
- Guidewire and inner dilator removed and 0.018 inch guidewire replaced with 0.035 inch guidewire.

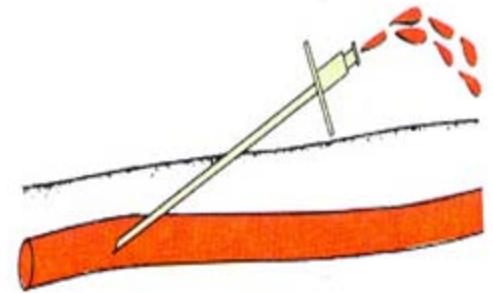


The **Seldinger technique**, also known as **Seldinger wire technique**, is a medical procedure to obtain safe access to blood vessels and other hollow organs.

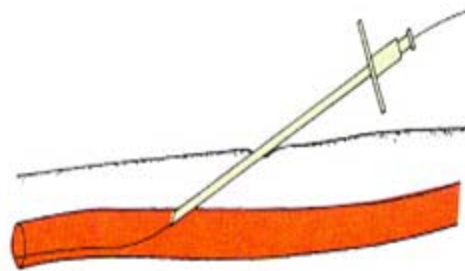
It is named after Dr. Sven-Ivar Seldinger (1921–1998), a Swedish radiologist who introduced the procedure in 1953.



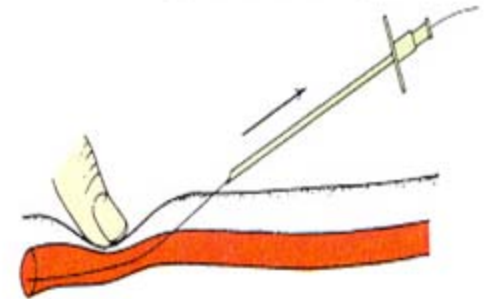
Step 1. Insertion of needle
(with inner cannula)



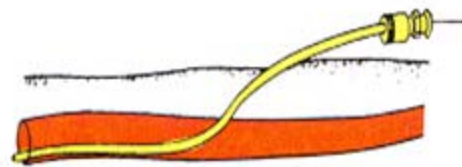
Step 2. Placement of needle in
lumen of vessel (inner
cannula removed)



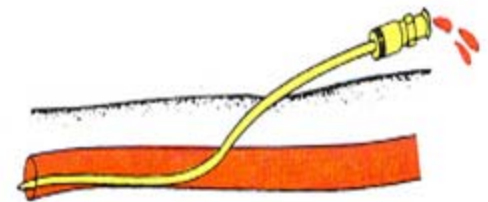
Step 3. Insertion of guide wire



Step 4. Removal of needle



Step 5. Threading of catheter
to area of interest



Step 6. Removal of guide wire

Tandem Trocar Technique

- Reference needle in collection
- Catheter assembly advanced to the same depth ,in the same plane
- Remove stylet and aspirate
- Advance catheter over stationary stiffener

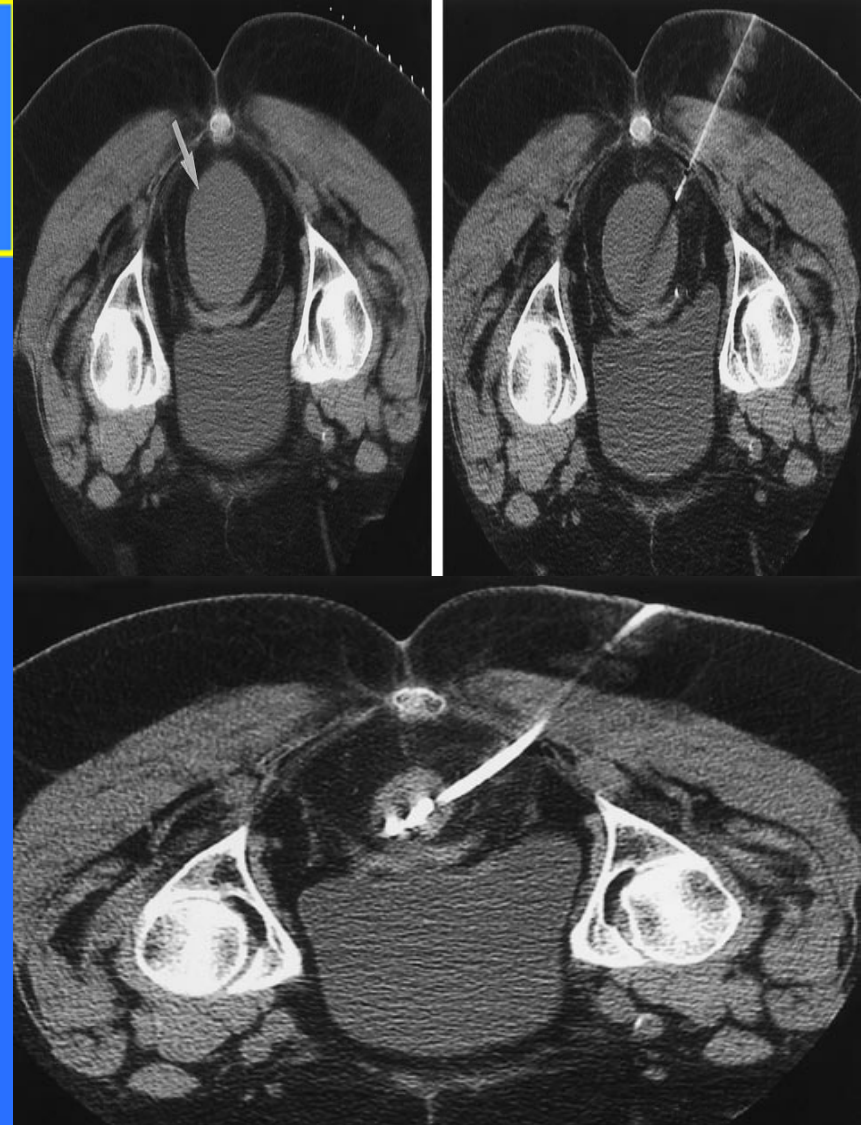
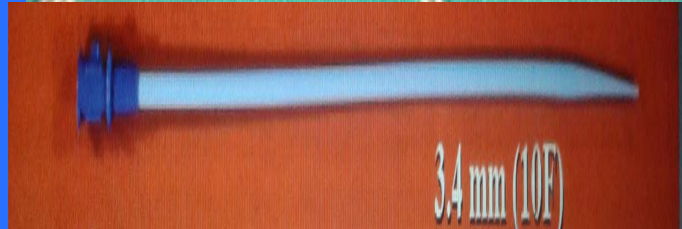
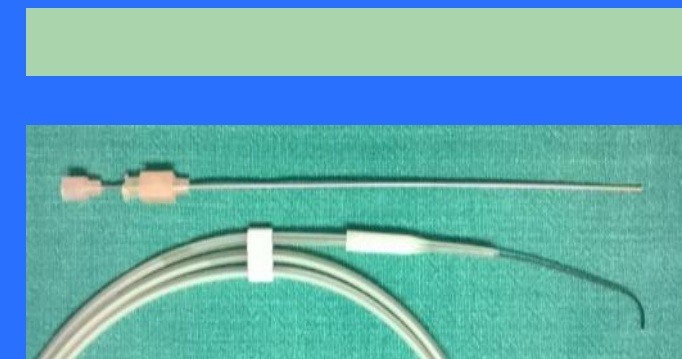
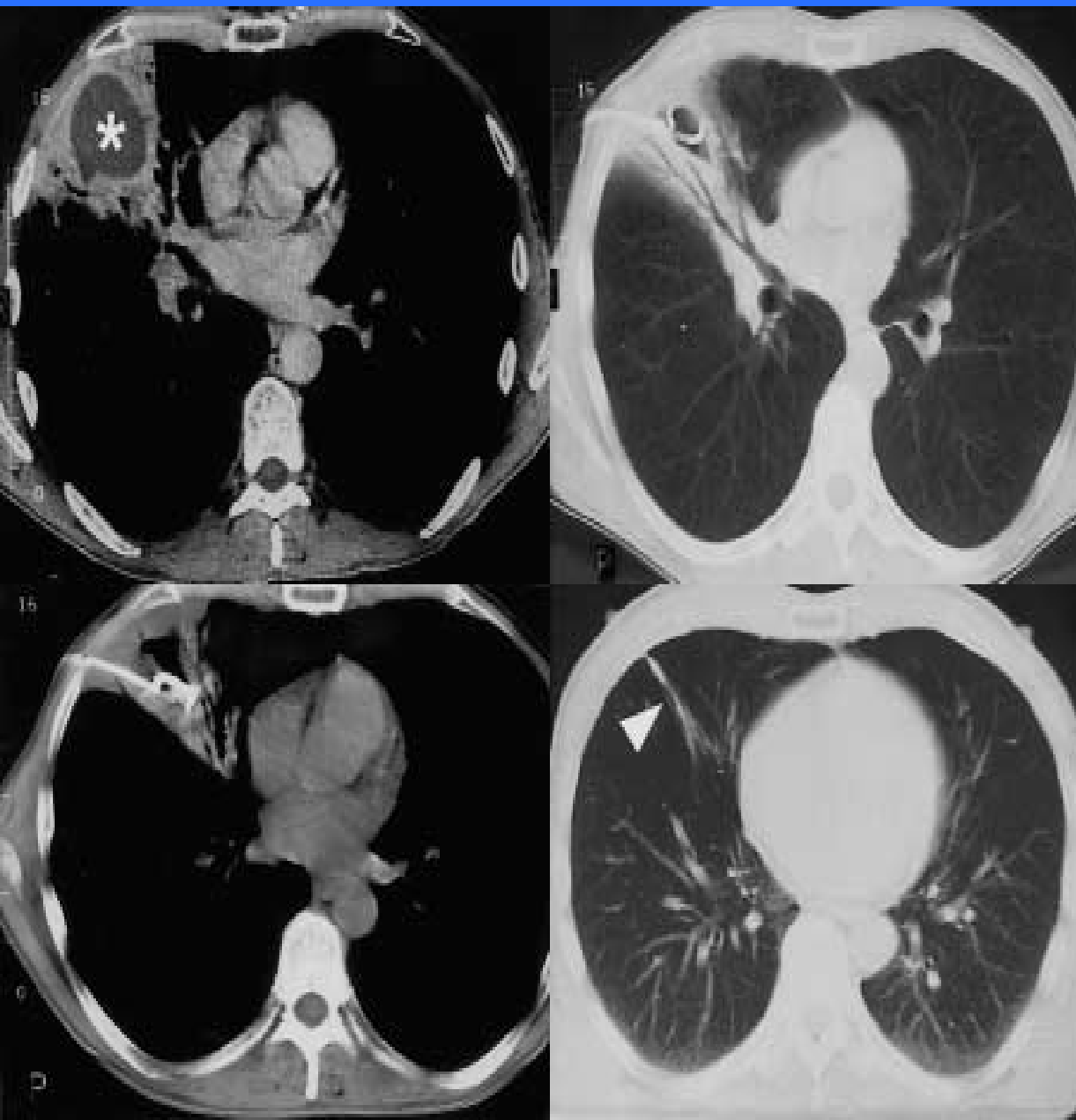


Image Guided Abscess Drainage



Interventions in Pancreatitis

The presence of *asymptomatic* pseudocysts and pancreatic and/or extrapancreatic necrosis do not warrant intervention, regardless of size, location and/or extension.

The inaccessible or Undrainable Abscess : How to drain it

Transvaginal and transrectal
USG guided drains in
low pelvic abscesses.

Tilting of CT gantry to access
high pelvic abscesses.

Transgluteal approach - close to
sacrum to avoid sciatic nerve +
gluteal vessels; below piriformis
to avoid sacral plexus



Post Procedure Care

Routine irrigation 2 to 3 times each day.

Proper irrigation involves the following steps :

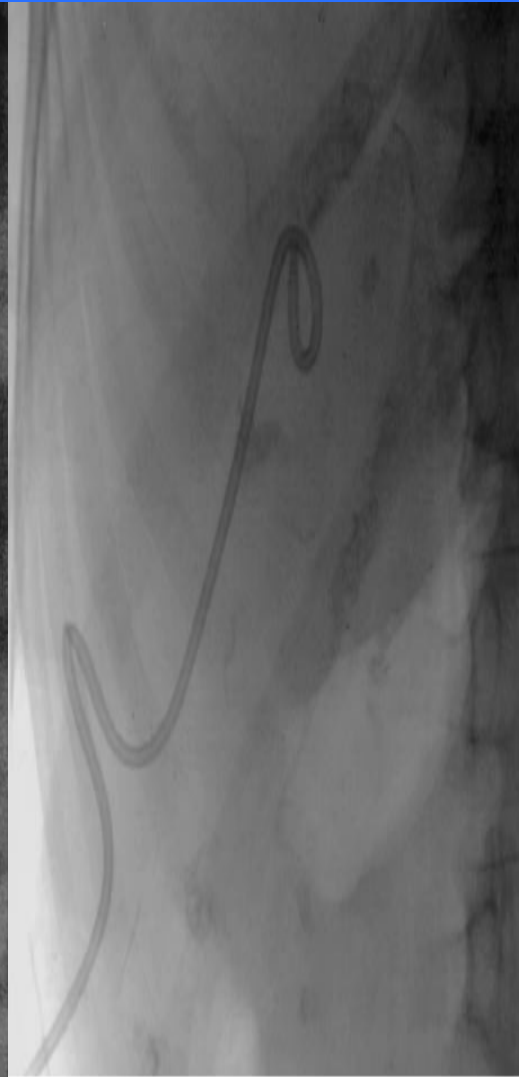
- Place a syringe in the stopcock and aspirate residual fluid
- Inject 10 ml of normal saline
- Aspirate the irrigant
- Reflush the catheter with 5 ml of normal saline.

A 2 to 4 mg dose of t-PA in 10 to 20 ml or more of normal saline may be instilled in drains that are properly positioned in viscous collections that are refractory to drainage after normal irrigation.

Problems encountered during catheter exchange/removal



Use Straight Guidewire



a.

b.

a.

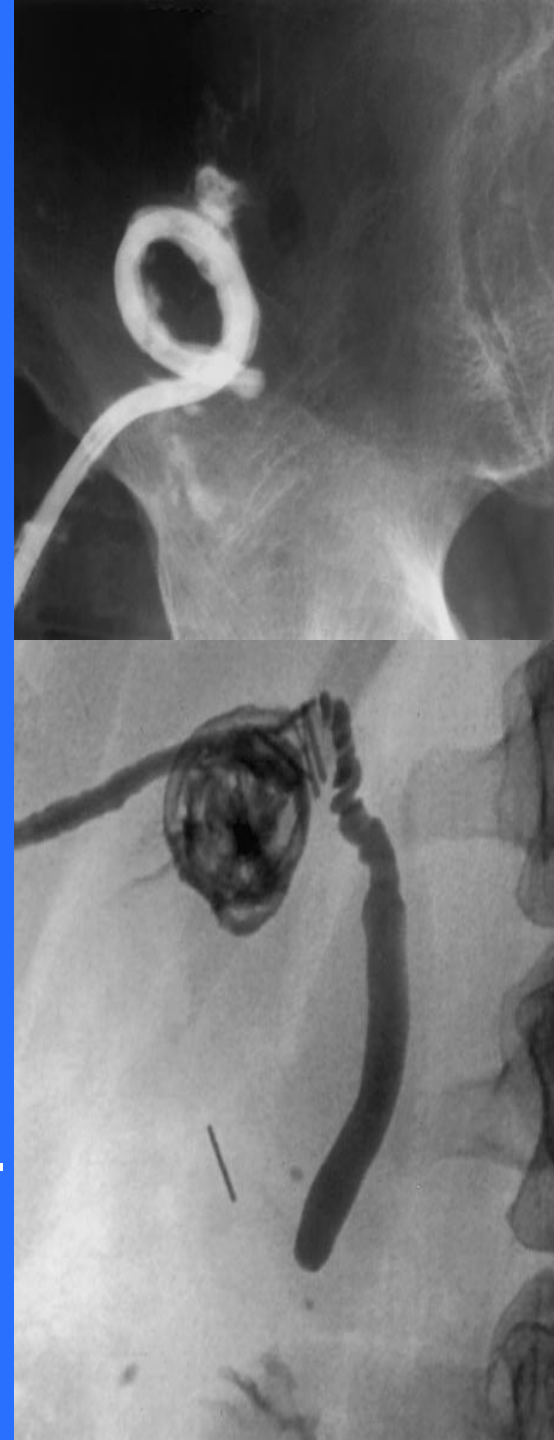
b.

Catheter may be removed when output is reduced to <10 ml/day and patient's clinical status improves.

If the patient's condition has improved, but drainage output has remained stable or increased, a catheter sinogram is indicated to evaluate for fistula.

Fistulas close with proper drainage unless :
The system (GI, urinary, biliary) is obstructed distally.

Infection or tumor resides in the fistula tract.
The patient has impaired healing (poor nutrition, steroid therapy)

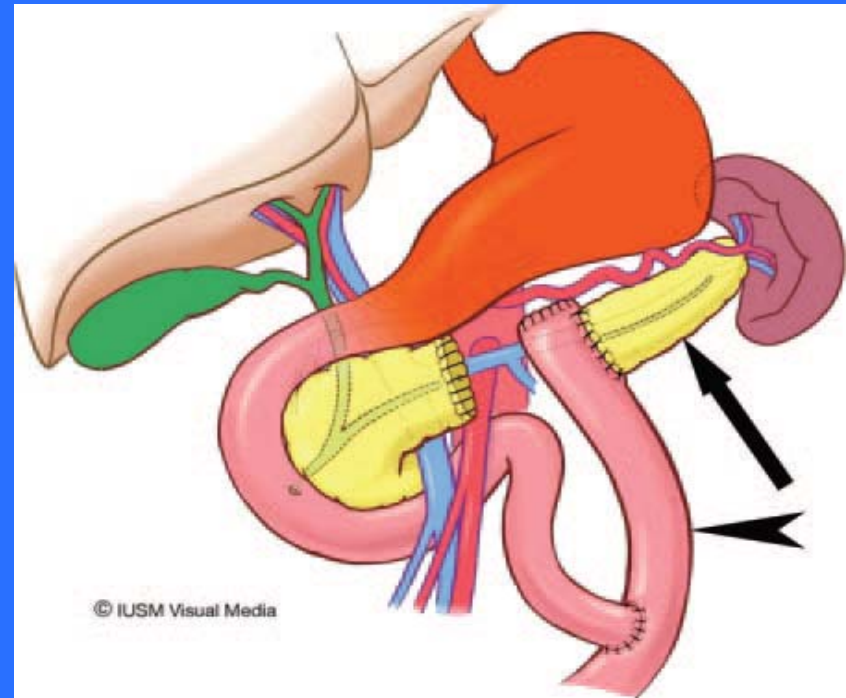


Persistent Pancreatic Fistula

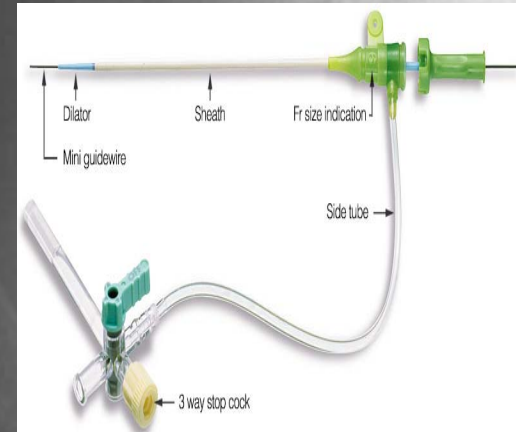
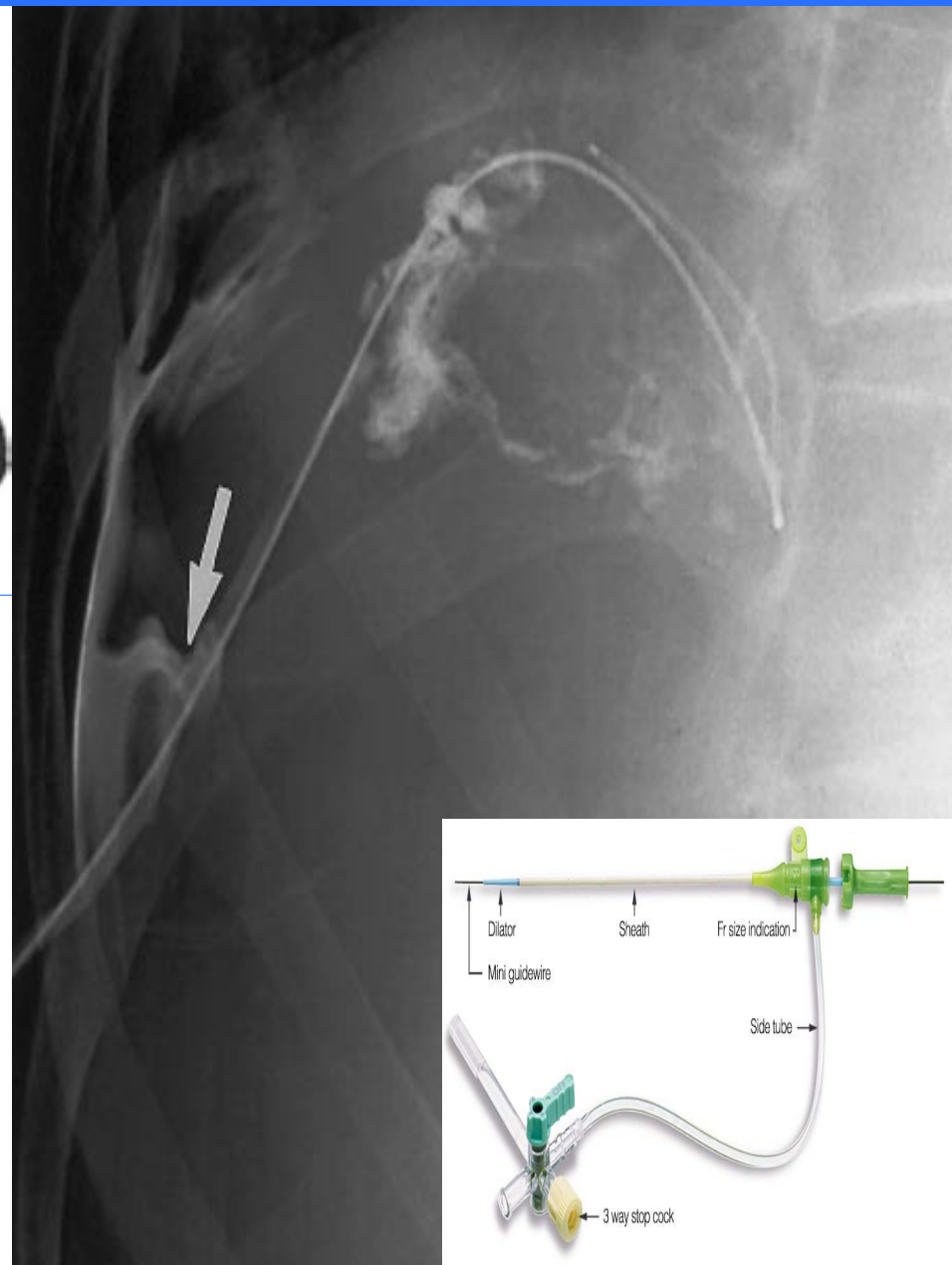
Drainage of clear pancreatic fluid for more than 4 weeks is diagnostic.

After acute inflammation has subsided , such fistula can be reduced effectively by octreotide (50 to 150 mg, s/c three times daily).

Surgery (Median segment pancreateojejunostomy or distal pancreatectomy) in disconnected pancreatic duct.



Tractography



Results and complications

Success rate of PFD combined with antibiotics and nutritional support is about 90% for simple complications.

Cure rate drops to 70% for complex collections :
infected hematomas,
multilocular abscesses,
abscesses complicated by bowel fistula,
pancreatic abscesses and
infected necrotic pancreatic collections.

Am J Roentgenol 2010; 194: 815

World J Surg 2001; 25: 362

Results and complications

The major complications of PFD are :

Bleeding, Bowel or bladder perforation, and Sepsis.

Hemorrhage is most likely when suboptimal access route was used for catheter placement or due to uncorrected coagulopathy.

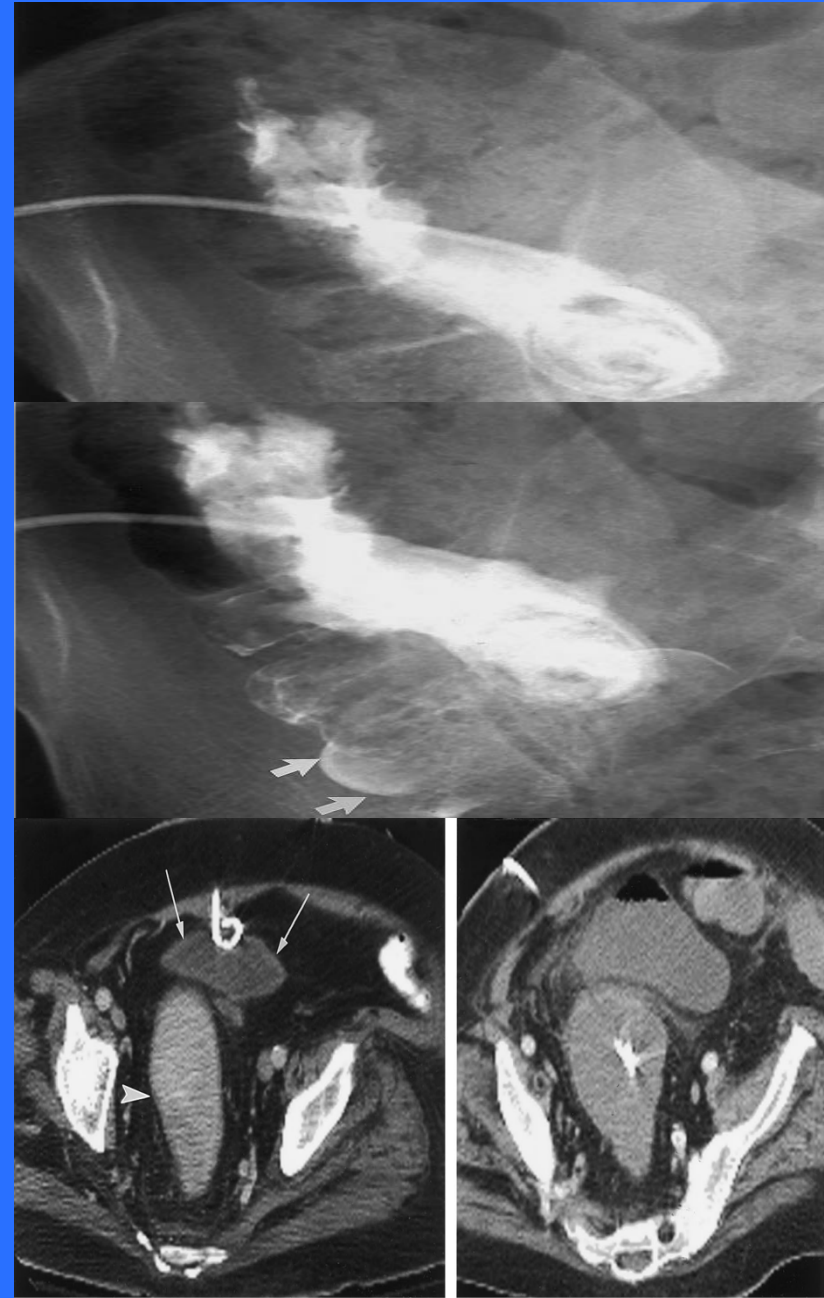
Commonly a second or third generation cephalosporin may be administered within 1 hour of the procedure, with a combination of clindamycin and gentamycin reserved for patients with penicillin allergy.

Inadvertent Bowel Perforation

If a loop of bowel is traversed en route to fluid collection, a second catheter is placed in the collection.

The first catheter is withdrawn until its tip is in the bowel lumen.

This enterotomy catheter is removed when a mature track has formed.



Inadvertent Bladder Perforation

On recognition of bladder perforation by a drainage catheter, the catheter is removed.

A Foley catheter is placed (if not already present) to ensure good bladder drainage.

The Foley catheter is left in place for 5 to 7 days to allow healing of the perforation.

The catheter then is clamped for 4 hours and removed if no urine leak is evident.

Minimising Complications

- Broad spectrum antibiotics
- Correct coagulopathy
- Adequate sedation + analgesia-beware the restless patient
- Good bowel opacification at CT
- Post procedure catheter management
- Beware collections adjacent to implants
aspirate>drain
- Discuss cases with clinical team



Thank you for your
attention

