Abdominal emergency interventions

• The concept of IR
• Emergency interventions
• Septic patient
  - Percutaneous drainage of collections of fluid
  - Percutaneous urinary interventions
  - Biliary interventions
• Complications
• Summary
The concept of interventional radiology

- Percutaneous minimally-invasive
- Real-time
- Images are used to direct interventional instruments throughout the body
- Diagnose and treat patients using the least invasive techniques

Advantages of IR

- Offering curative therapy to some patients
- Capability to perform bedside procedures
- Reduction / elimination of the need for general anesthesia
- Possibility of delaying surgery in critically ill patients until it is feasible time

Radiology - imaging / interventions

- Diagnosing
- Radiologic interventions techniques allow non-surgical treatment
- Detecting complications in follow-up studies
Pre-procedure

- Assist procedure planning and risk assessment
- Optimizing the preoperative status of the patient

- an intravenous line should be established before the procedure.

Pre-procedure

Guiding modality for IR is chosen on:
- “what” and “where” to treat
- “target” (organ) size
- personal preference of the interventional radiologist
- and appearance on the previous images in the different modalities

Fluoroscopy / CT / Ultrasound / MRI
- different advantages / limitations

Anesthesia?

Procedure

- In general the procedures are done in local anesthesia, but the patient may be monitored by an anesthesiologist under intravenous sedation.
- Standardization of technique for treatment
- Prophylactic antibiotics should be considered if procedural time exceeds 3 hours
- Procedure time

- Minimize risk / improve outcome
You can reach anywhere throughout the body with your needle

The value of clinical interventional radiology.

Seldinger vs. trocar

- Trocar: many drainage catheters come with the option of being deployed as a trocar by putting in an inner stylet
Dr. Sven-Ivar Seldinger

- Dr. Sven-Ivar Seldinger (1921-1998), a Swedish radiologist from Mora, Dalarna County, who introduced the procedure in 1953.
Post-procedure

- Observation

- Suggest follow-up examinations: an abscessogram to evaluate the reduction in size of an abscess cavity / fistula formation
Emergency interventions

- CNS
- Vascular / bleeding
- Septic patient
  - instituting IR in an emergency setting

Acute care imaging / IR

- The Emergency Radiology provides constant and immediate consultation by interpreting all studies performed in the University Hospital Oslo, Ullevål.
- These studies range from minor injuries and illnesses to the most severe life-threatening afflictions, e.g., motor vehicle accidents, falls, gunshot wounds, etc.
- Some life-threatening conditions will need immediate abdominal emergency interventions.
Acute non-vascular Abdominal IR

- CNS
- Vascular / bleeding
- Septic patient

Septic patient

Dealing with the septic patient in the interventional radiology setting.

Interventionists must be prepared to institute therapy and manage the patient through the procedure.

Percutaneous abscess drainage (PAD)

Percutaneous urinary interventions

Biliary interventions
Percutaneous abscess drainage (PAD)

- Bacterial peritonitis
- Pancreatitis
- Mediastinal abscesses after esophagectomy

Infected tissue categorized by:
- Location
- Viscosity
- Complexity
- Contents
- Etiology
- Surrounding structures
Preprocedure evaluation

- Abscesses on CT and US, strong signs:
  - well-circumscribed fluid collection
  - thickened membranes or septations
  - peripheral contrast enhancement
  - does not demonstrate central enhancement on imaging studies
  - gas bubbles
  - debris

What can be treated?

- Size (3 cm)
- Viscosity and complexity
- Complex abscesses:
  - lytic agents
  - multiple catheters
  - maceration technique
  - larger diameter catheters

What can be treated?

- An aggressive practical approach with relatively simple devices and techniques may yield a high success rate with few complications.
- Flush the catheters?
- Drainage bag?
Post-interventional to PAD

- Follow up studies (abscessogram)

- Drainage time from 1 week to months
  - A fistula increases the duration of catheter use
  - Adjust the volume and frequency of catheter flush

- Removal of catheter:
  - withdrawn when clinical, laboratory, and radiologic improvement is observed

Routs to the pancreatic bed

- a) transhepatic transgastric route → lesser sac
- b) transgastric route → lesser sac
- c) gastrosplenic ligament
  - lesser sac
- d) left anterior pararenal space
- e) paravertebral
- f) right pararenal space to the duodenum
- g) through the
duodenum
The Salamander is set free
…looking for the gallbladder mouse

Percutaneous urinary interventions
Pyonephrosis
Biliary interventions

Cholangitis
Cholecystitis

• Percutaneous transhepatic cholangiography, PTC
  – Image obstructions
  – Treatment (catheters / stents placement)
  
  PTC: treatment of choice in benign anastomotic strictures after bilioenterostomy

• Cholecystostomy
  – Placement of a tube into the gallbladder
“Rendevouz” = date
Drainage of the gallbladder

Complications

Identify

Avoiding

• General or specific
• Early and delayed complications
• Minor / major complications
Radiological postinterventional complications

- Pain
- Perforation
- Pneumothorax
- Infection
- Vascular (bleeding) and biliary injury
- Death

Rad. postinterventional complications cont.

- Peritoneal bleeding can be treated with blood transfusions and/or transarterial embolization
- Infections are treated with administration of antibiotics (PAD?) and observation.

"The patient in the next bed is highly infectious. Thank God for these curtains."
• Strategies for improving IR outcome:
  – instituting IR in an emergency setting
  – standardization of technique for treatment
  – optimizing the pre-interventional status of the patient
  – identify & avoiding complications

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