



ESER

European Society of
Emergency Radiology

ESER 2019 WORKSHOP

May 12, 2019 | Oslo, Norway

Syllabus



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Magnus Mejlaender-Evjensvold, Oslo/NO

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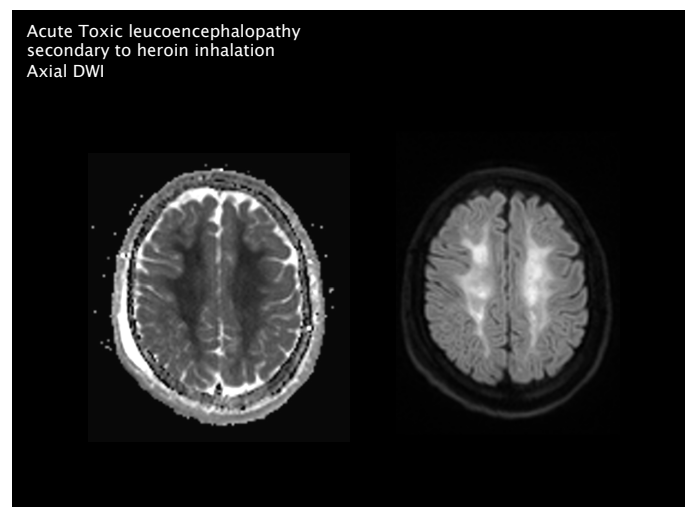
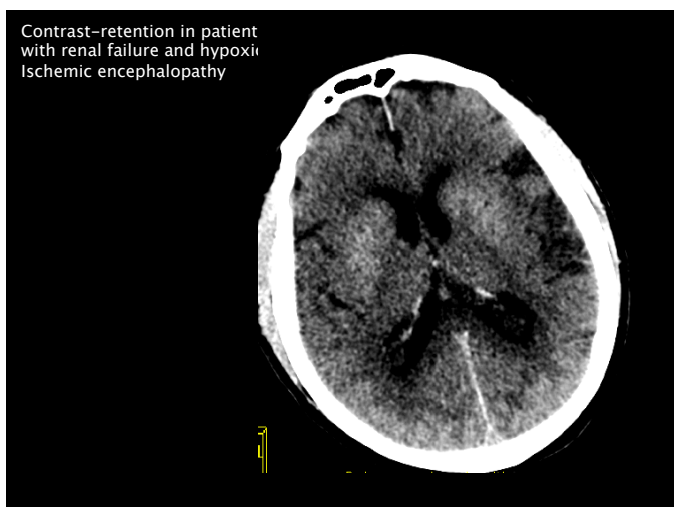
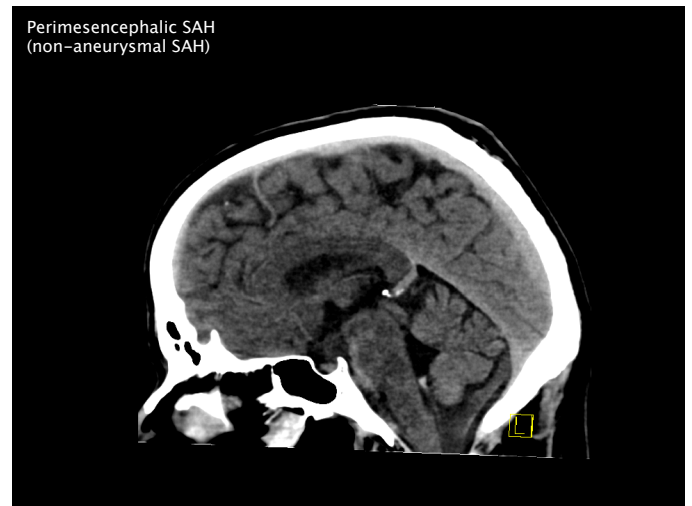
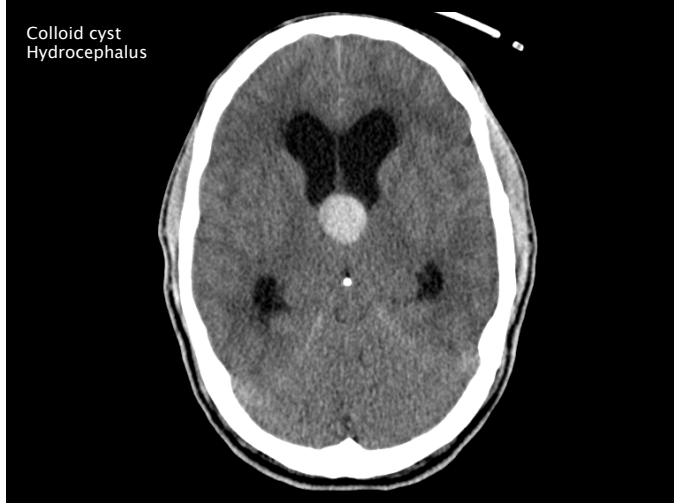
Elizabeth Dick, London/UK

» **Workshop 3 Acute Abdomen - Your first night on call**

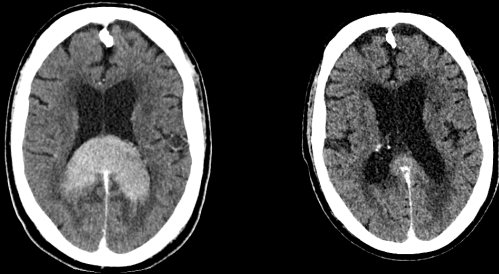
Mari Nummela, Helsinki/FI

» **Workshop 4 Post operative Abdomen**

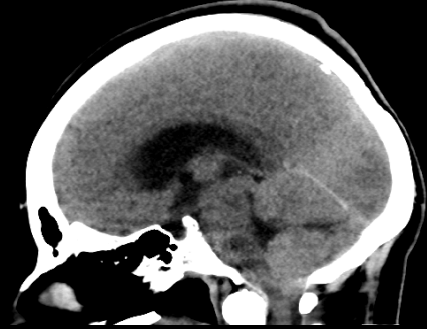
Giedre Kavaliauskiene, Oslo/NO



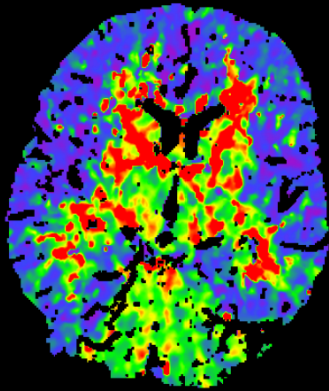
Primary CNS lymphoma
Before and after steroids



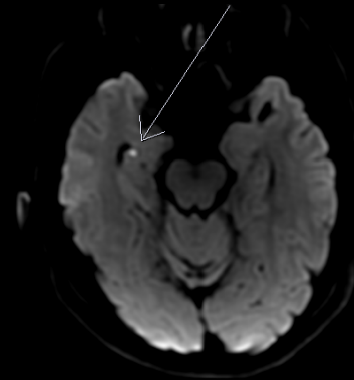
Intracranial hypotension
with tonsillar herniation
after spinal surgery (due
to CSF-leakage)

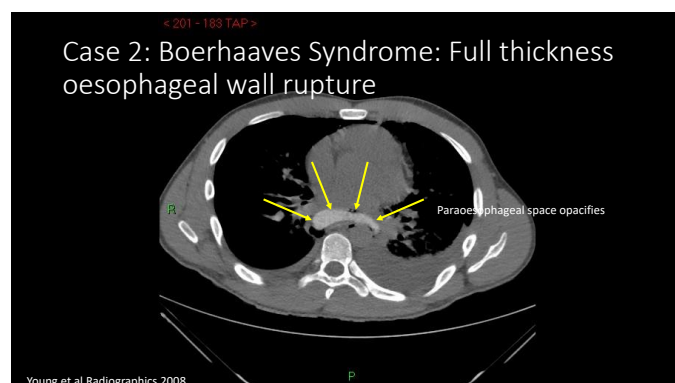
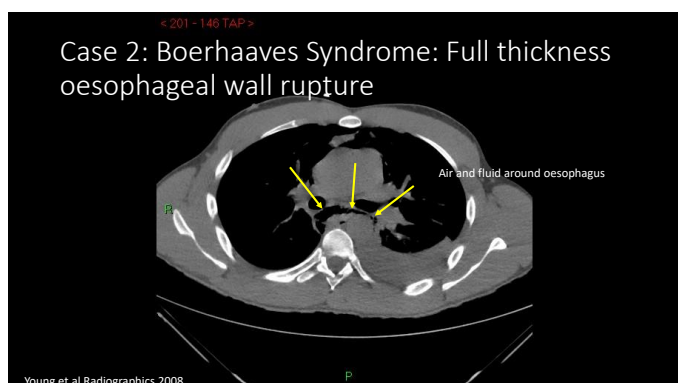
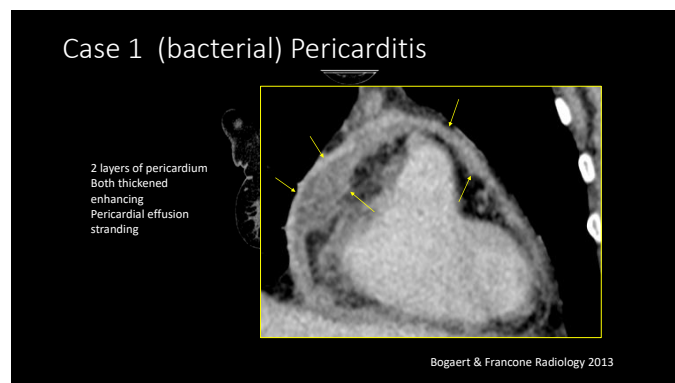
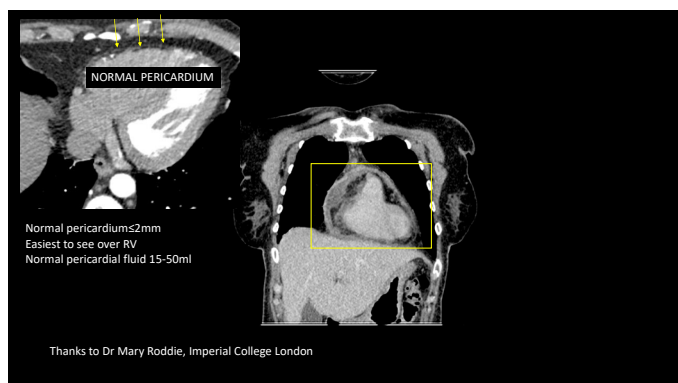
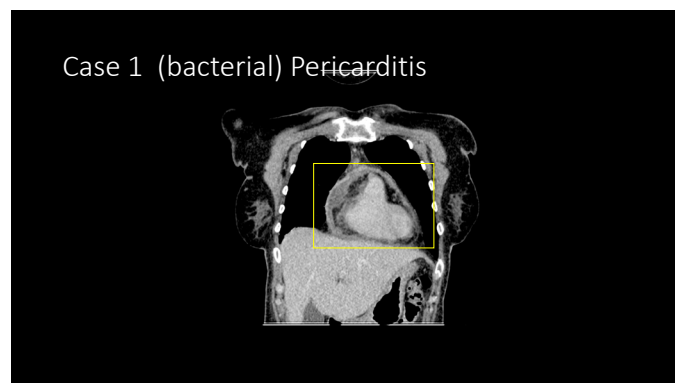


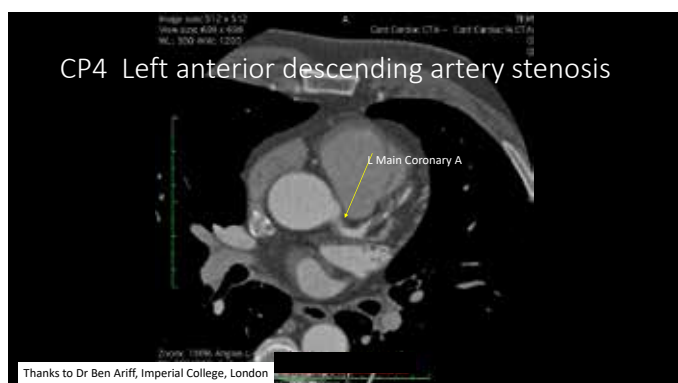
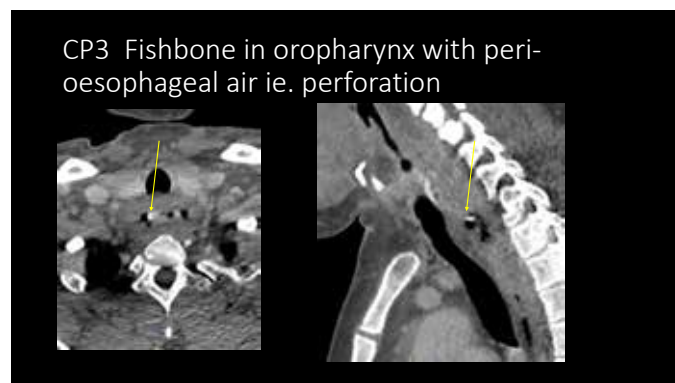
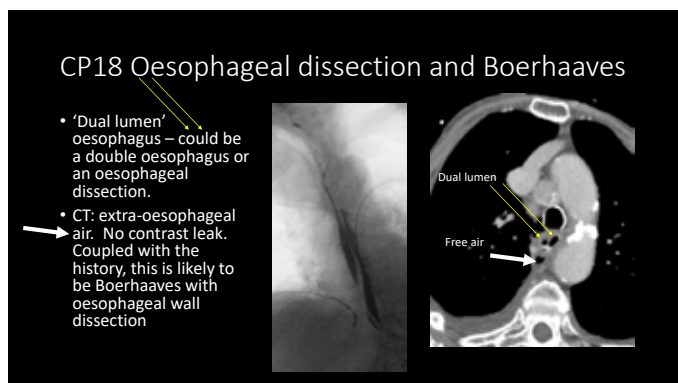
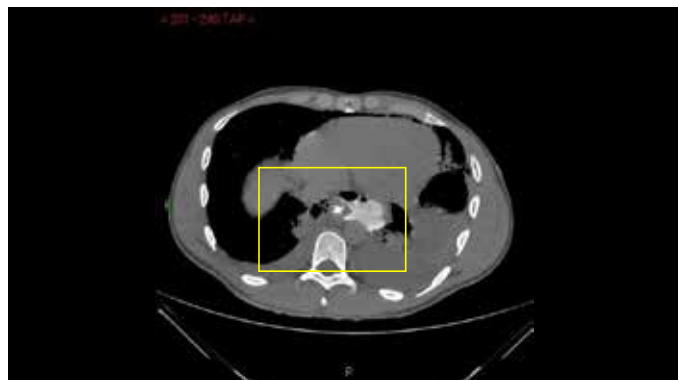
Central venous stasis due
To thrombosis of straight
Sinus - CT perfusion (TTD)

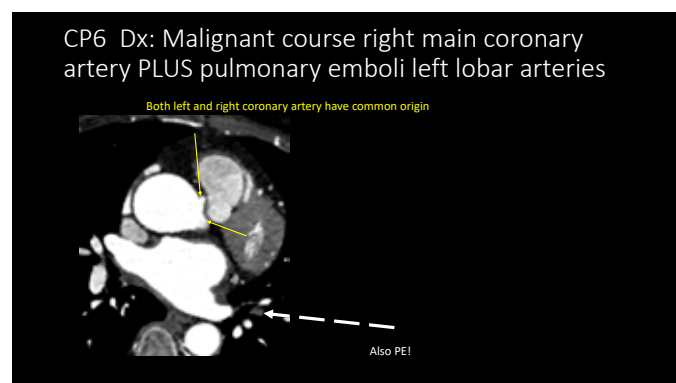
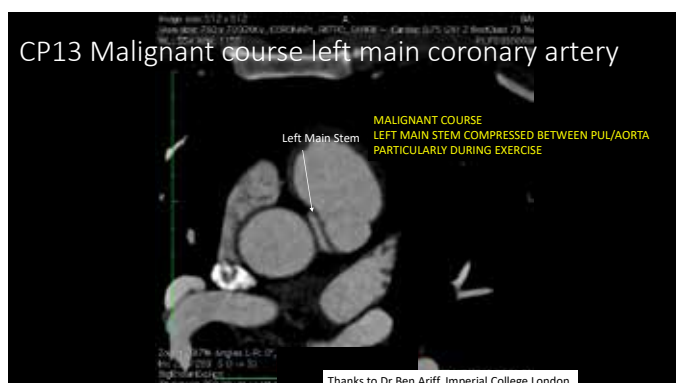
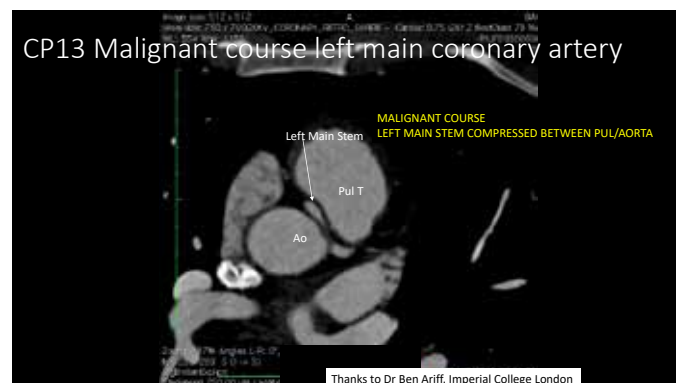
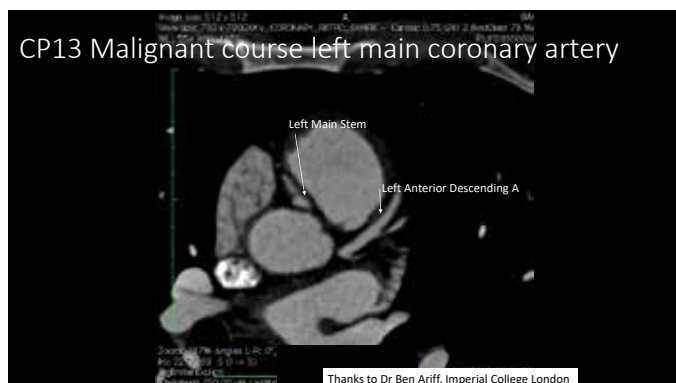
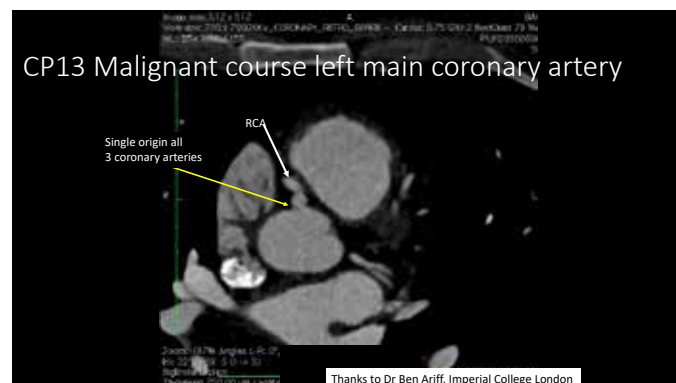
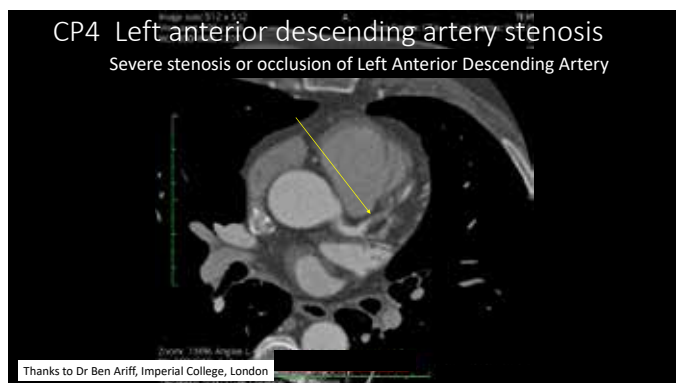


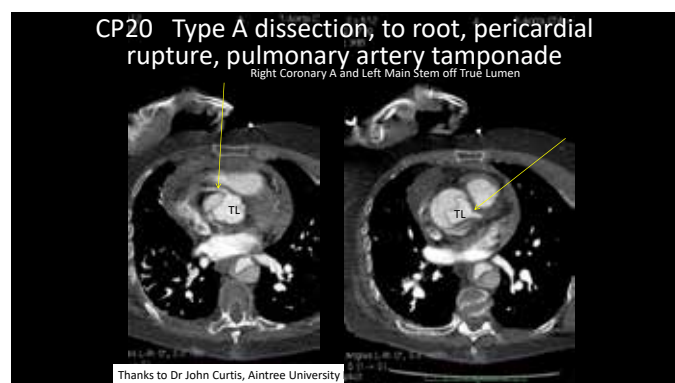
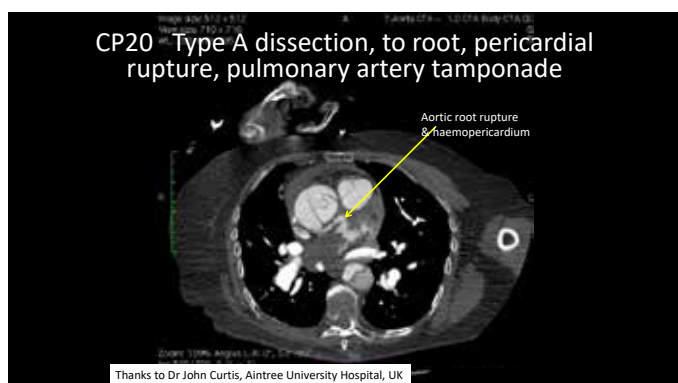
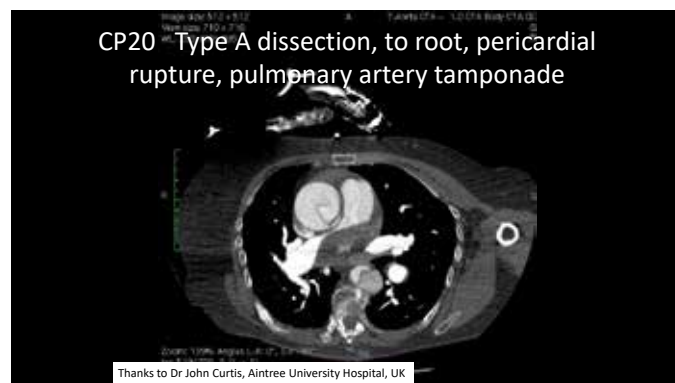
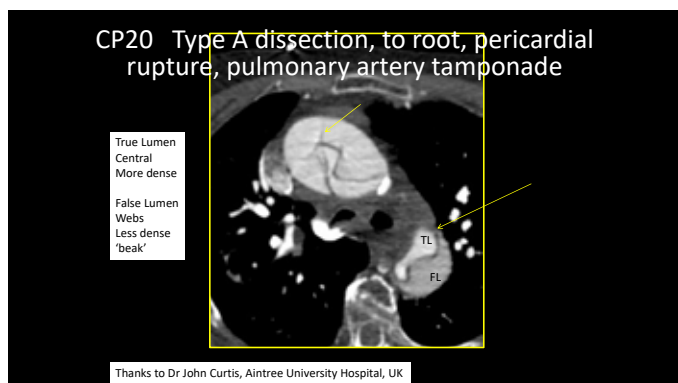
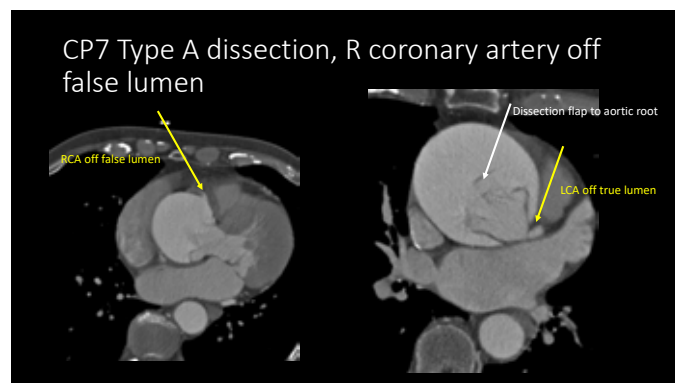
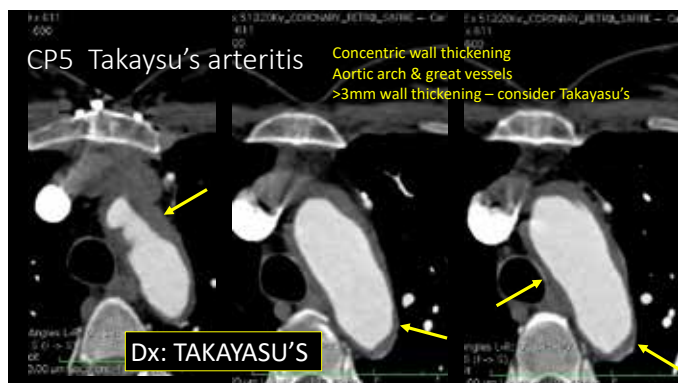
Transient Global Amnesia

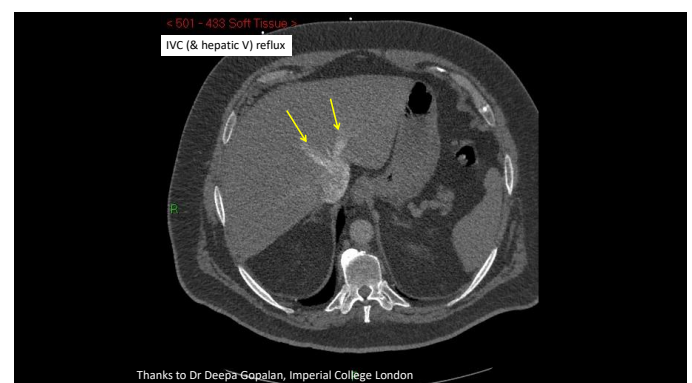
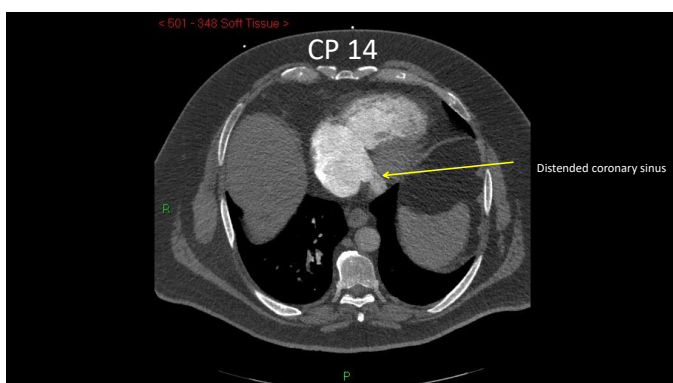
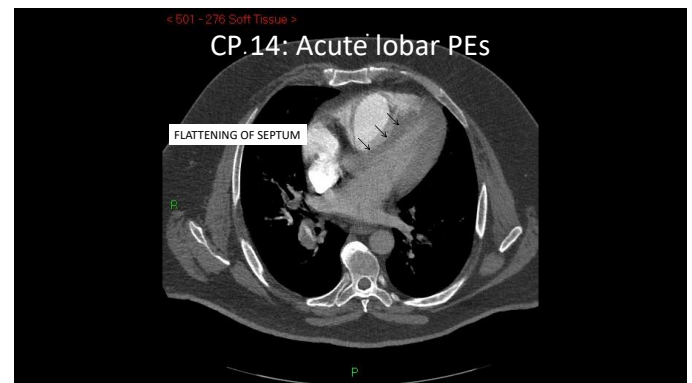
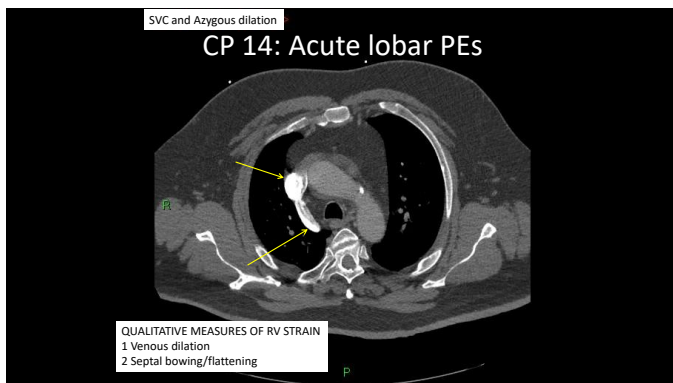
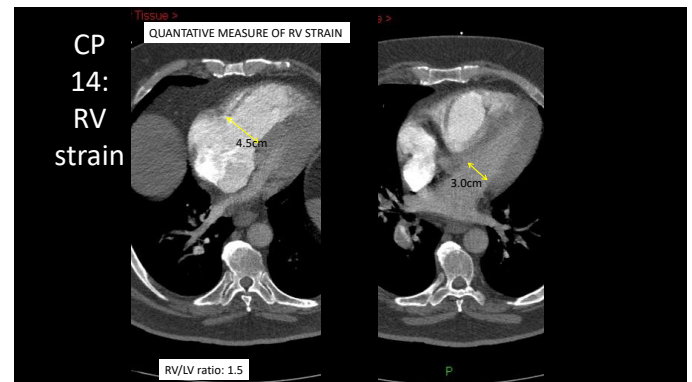
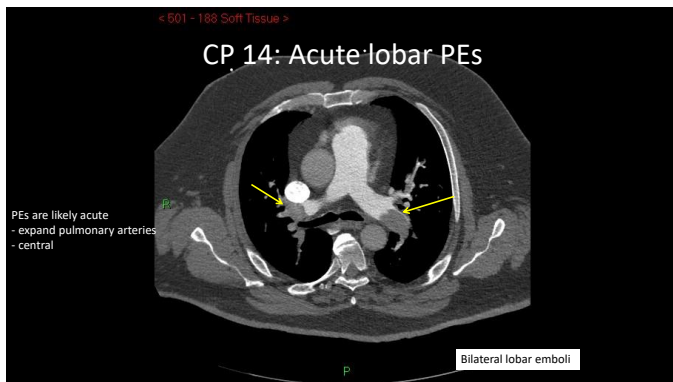




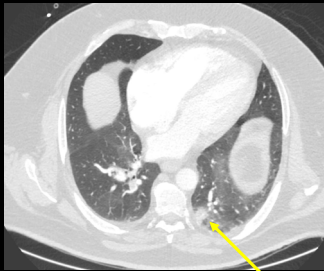




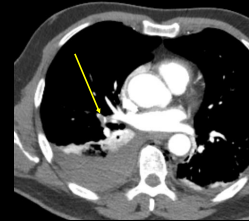




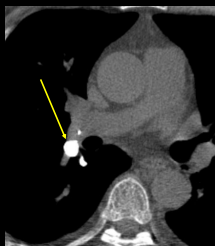
Secondary lung infarction



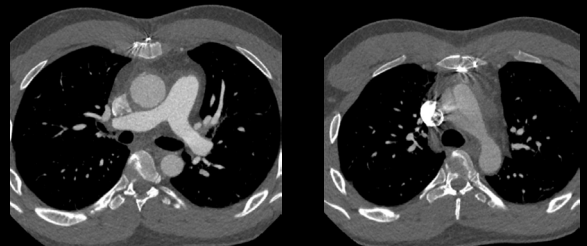
CP17 fat embolus post # (measure ROI)



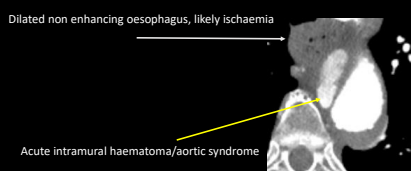
CP11 cement embolus



CP15 Acute chest pain ?PE (for CTPA) - actually due to Type A aortic dissection



CP19 Acute chest pain due to acute aortic syndrome and oesophageal ischaemia



DON'T MISS THIS! ESSENTIAL EMERGENCY IMAGING HANDS-ON WORKSHOP

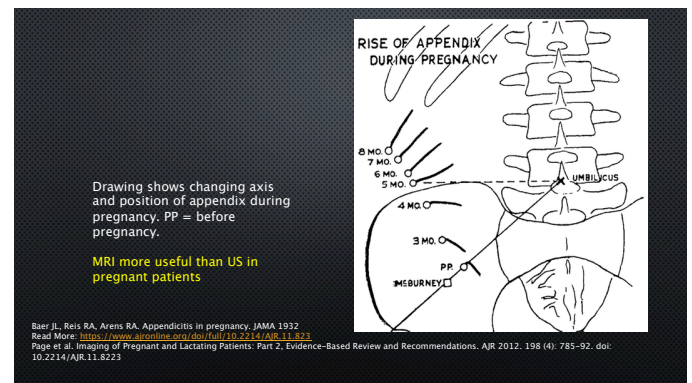
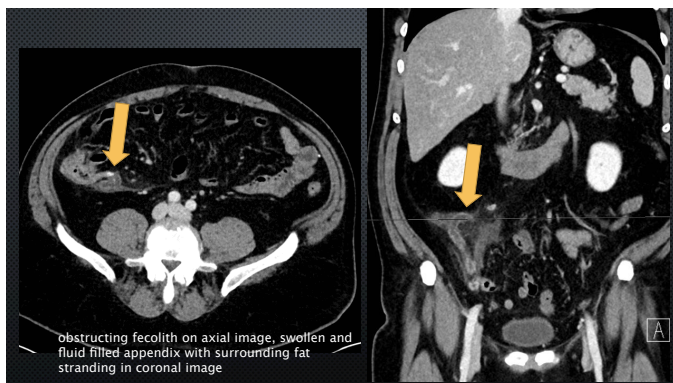
13:00–14:15
ACUTE ABDOMEN – YOUR FIRST NIGHT ON CALL

MARI NUMMELA, HELSINKI/FI

ESER/NORDTER OSLO WORKSHOP
SUNDAY, MAY 12, 2019

CASE 1 – NUMABD_1

- 62 M
- ACUTE APPENDICITIS

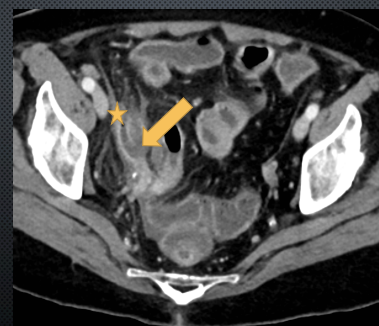


CASE 2 – NUMABD_2

- 70 F
- PERFORATED APPENDICITIS

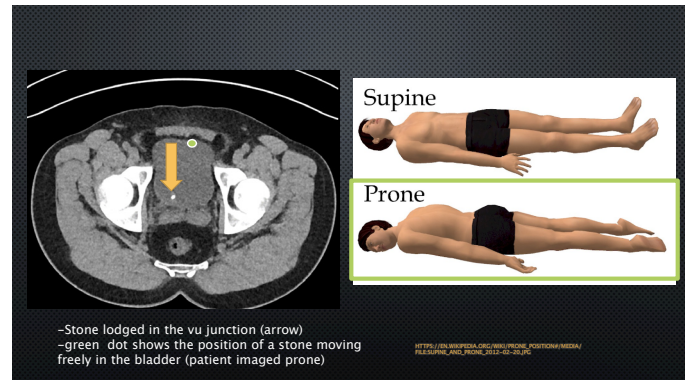
defect in the appendiceal wall, fluid leakage (arrow)

adjacent peritoneal wall is thickened due to focal peritoneal irritation/peritonitis (star)



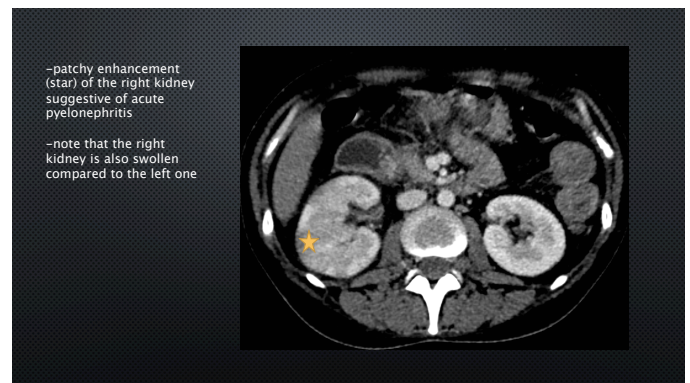
CASE 3 – NUMABD_3

- 50 M
- URINARY STONE



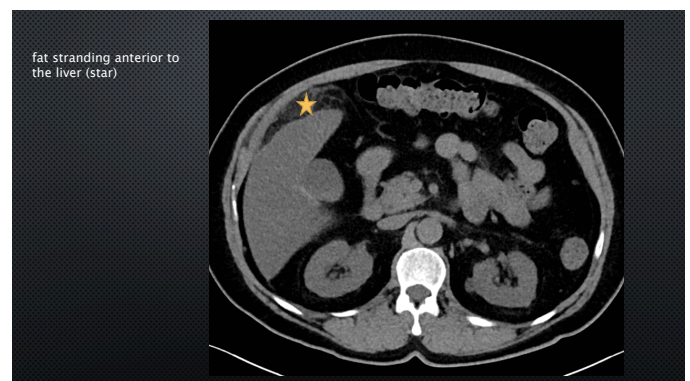
CASE 4 – NUMABD_4

- 30 F
- ACUTE PYELONEPHRITIS



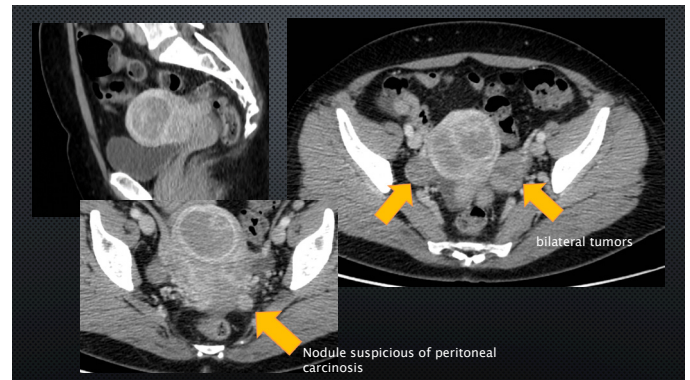
CASE 5 – NUMABD_5

- 58 F
- OMENTAL FAT INFARCTION



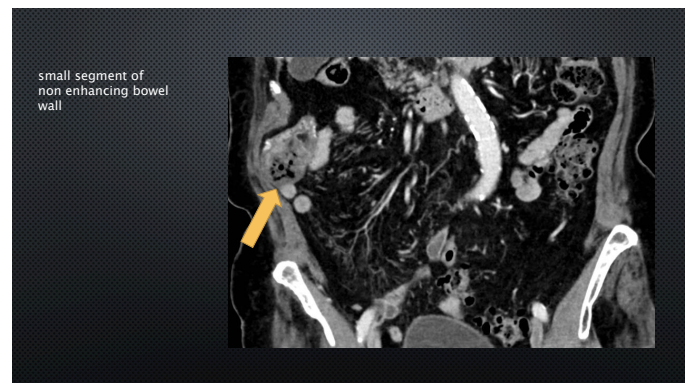
CASE 6 – NUMABD_6

- 52 F
- BILATERAL OVARIAN TUMORS



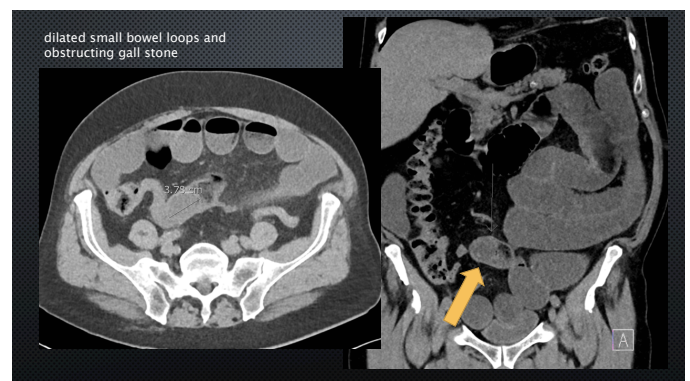
CASE 7 – NUMABD_7

- 87 F
- MESENTERIC ISCHEMIA, SMALL NON-ENHANCING SEGMENT IN THE CAECUM WALL (NO TOTAL VESSEL OCCLUSION)



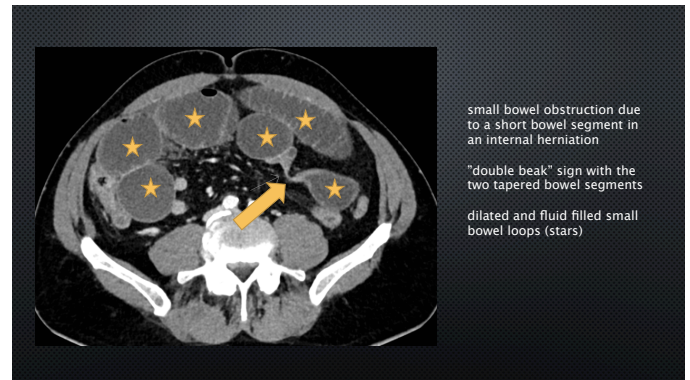
CASE 8 – NUMABD_8

- 73 M
- GALL STONE ILEUS



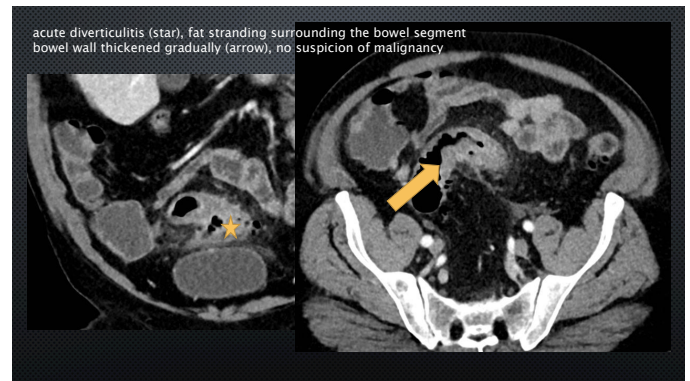
CASE 9 – NUMABD_9

- 56 M
- CLOSED LOOP OBSTRUCTION



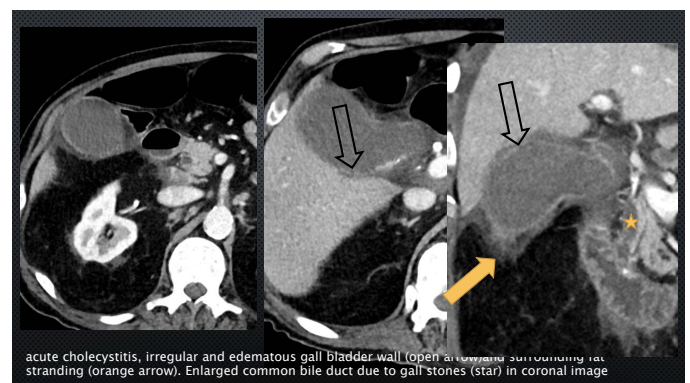
CASE 10 – NUMABD_10

- 71 M
- DIVERTICULITIS



CASE 11 – NUMABD_11

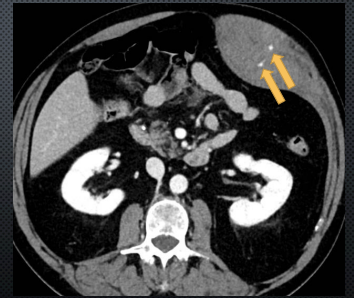
- 63 M
- ACUTE CHOLECSTITIS



BONUSCASE 12 – NUMABD_12

- 62 YO MALE
- RECTUS MUSCLE HEMATOMA

rectus muscle hematoma with
active contrast extravasation



Postoperative abdomen “Key Images”

Giedre Kavaliauskiene
Oslo University Hospital

ESER Oslo Workshop
Sunday, May 12, 2019

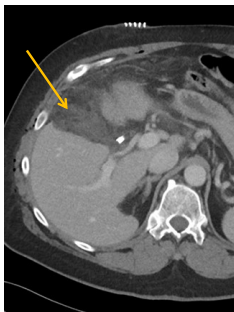


Case 1

- Previous gastric bypass surgery re-operated several months ago
- 2 days after cholecystectomy (stones)
- Now fever and abdominal pain.
- Bile leak? Bowel perforation? Internal hernia?

Answer: Bile leak after cholecystectomy

2nd day



9th day

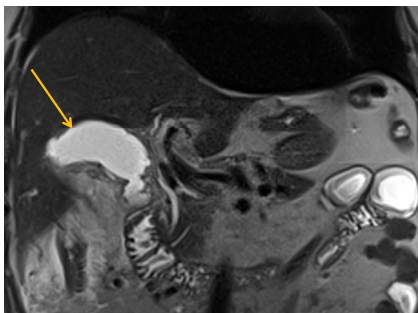


Too much fluid in gallbladders bed in the initial CT and increasing after 7 days

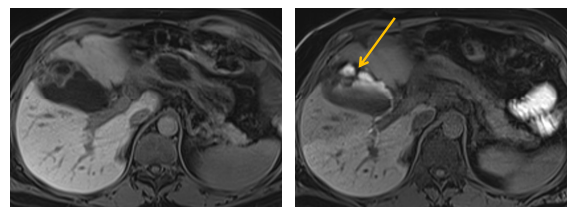
Key concepts (1)

Two different recent operations: gastric bypass and cholecystectomy. There was normal postoperative anatomy after gastric bypass, no signs of internal hernia or SBO, but too much fluid in gallbladders bed in the initial CT and increasing after 7 days

MRCP (T2 cor), the same 9th PO day, fluid in gallbladders bed (yellow arrow)



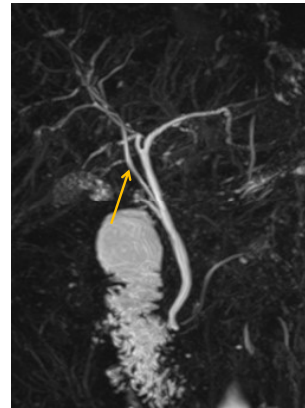
T1 fs after liver-specific contrast (Gd-EOB-DTPA)
20 min 2 hours



Contrast leak with bile into fluid collection after 2 hours confirms the active bile leak

Key concepts (2)

CT is usually the modality of choice in postoperative setting, but MRCP is more and more common nowadays before and after cholecystectomy to diagnose biliary stones, anatomical variants of the bile ducts (short or long cystic duct, aberrant right hepatic duct etc.) and bile leaks (MRCP with liver specific contrast).

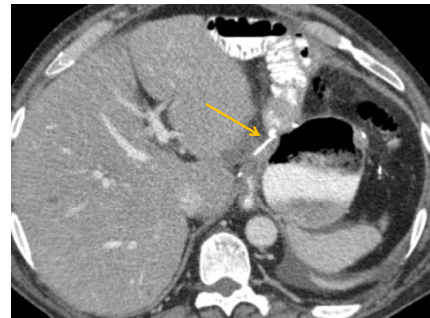


Another case, MRCP shows aberrant right hepatic duct (yellow arrow) – anatomical variant

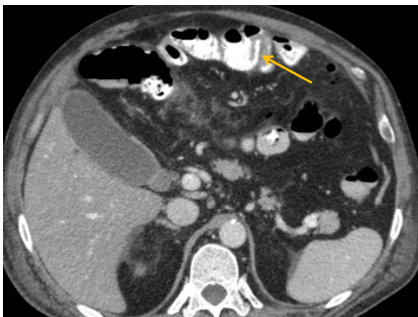
Case 2a

- Subtotal gastrectomy with Roux-En-Y anastomosis 7 days ago (cancer)
- Now distended abdomen, pain, CRP 300
- Bowel perforation? Leak?

Answer: Duodenal stump leak



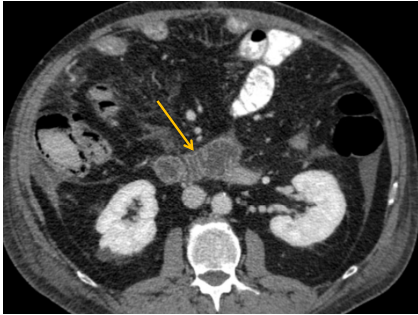
Gastro-jejunal anastomosis, subtle postoperative fat reaction, but no air or intensive infiltration around



Jejuno- jejunal anastomosis, radio-opaque stapler line helps to identify anastomosis (yellow arrow). No fat infiltration around.



Intensive fat infiltration and fluid subhepatically around the duodenal stump is suspicious for the leak



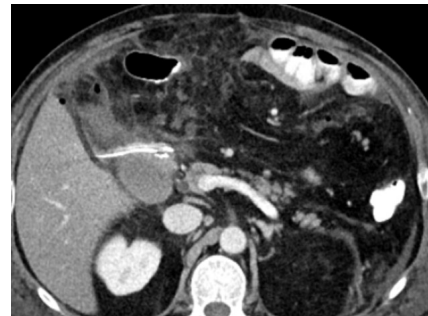
Note the duodenum that is not filled with oral contrast

Key Concepts

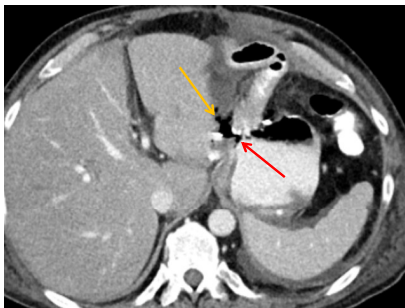
- This is subtotal gastrectomy with Roux-En-Y anastomosis. It is important to identify all anastomosis (gastro-jejunal and jejuno-jejunal) and do not forget duodenal stump!
- Only water-soluble contrast can be given
- Oral contrast does not help to detect leak from duodenal stump, as it usually fails to fill the afferent (biliopancreatic) loop
- Absence of free air does not exclude leak, especially from duodenal stump
- **Fat infiltration and fluid around one anastomosis or stump is suspicious for a leak**

Case 2b

- The same patient.
- 3 days after the last operation (closure of duodenal stump leak)
- 3 abdominal drains
- Now again fever, increasing CRP, sepsis
- Abscess?
- Answer: Perforation of gastro- jejunal anastomosis



Fat infiltration and some fluid subhepatically is expected 3 days after previous duodenal stump re-operation



Now there is air and fluid around G-J anastomosis (yellow arrow), which was intact during previous operation. Also note defect in G-J anastomosis (red arrow)



One drain is very close to the anastomosis; suspected as the cause of perforation. Absence of oral contrast leak does not exclude anastomosis leakage!

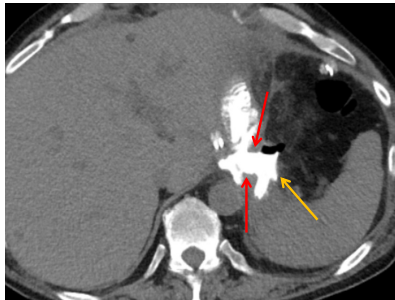
Key Concepts

- Do not focus on only known operated areas, complications can occur elsewhere
- Always check surgical drains
- Absence of oral contrast leak does not exclude anastomosis leakage!

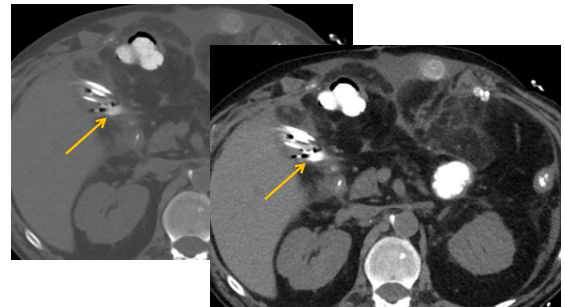
Case 2c

- The same patient as in 2a and 2b, 3 weeks after total gastrectomy due to G-E anastomosis leakage
- Again fever and increasing CRP
- Leak? Abscess?

Answer: Leak from EJ anastomosis



Esophago-jejunal anastomosis: large defect on the left side (red arrows). Oral contrast that is not surrounded by the bowel wall is a leak (yellow arrow)



Note the oral contrast leaks along abdominal drains. Leak can be obscured by opaque drain, therefore check drains also in bone window

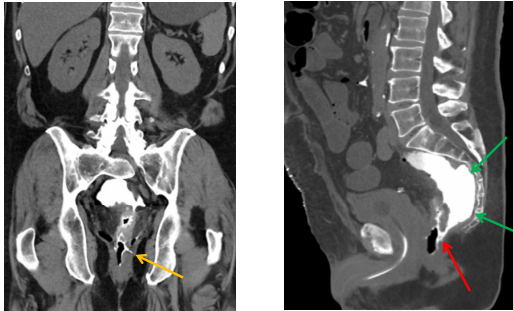
Key Concepts

- Esophago- jejunal anastomosis can be end-to-side or end-to-end. It is important not to call anastomosis as a leak and leak as end-to-side anastomosis
- Oral contrast that is not surrounded by the wall is a leak, but knowing your surgeons preferences and postsurgical anatomy helps to avoid mistakes
- Always check surgical drains, oral contrast can leak along abdominal drains. Sometimes this is the only localization of contrast leak (without fluid collections) that can be obscured/ missed because of opaque drain

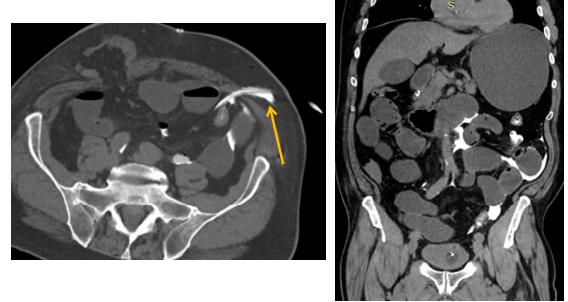
Case 3

- 2 days after low anterior rectum resection (proctosigmoidectomy) with coloanal anastomosis and temporal loop ileostomy on the right side
- Bad kidney function
- CRP 300, pain
- Leakage?

Answer: Leak from coloanal anastomosis to peritoneal cavity



Coloanal anastomosis (yellow arrow). Defect dorsally in anastomosis (red arrow) with rectal contrast leak to the pelvis (green arrows)

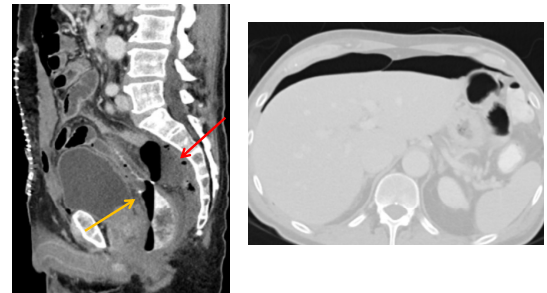


Rectal contrast also leaks into the peritoneal cavity. Leak is accompanied by paralytic ileus. Contrast extends to the abdominal wall along the drain (yellow arrow)

Case 4a

- 4 days after high anterior resection with colorectal anastomosis
- Now fever, CRP 305
- Anastomosis leak?

Answer: Colorectal anastomosis leak and signs of colon ischemia cranially from anastomosis



Colorectal anastomosis (yellow arrow). No leak of rectal contrast, but a lot of air and fluid around anastomosis (red arrow), that are indirect signs of leakage. Also free air in abdomen



Positive rectal contrast can obscure evaluation of colon wall, but there is reduced contrast enhancement and slight wall thickening cranially from anastomosis (yellow arrow)

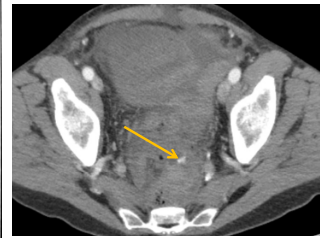
Case 4b

- The same patient as in 4a
- 5 days after re-operation with colostomy and closed rectum stump (Hartmann's operation)
- Abdominal pain, signs of peritonitis
- Stump perforation? abscess?

Answer: No stump perforation. Big hematoma with active bleeding



No rectal contrast leak from the rectal stump (stump stapler line is marked with yellow arrow). Filling defects in stump are blood clots (red arrow)



A lot of hyperdense fluid in the pelvis represents a big intraperitoneal hematoma. Little focus of active bleeding in the pelvis cranially from the stump (yellow arrow)

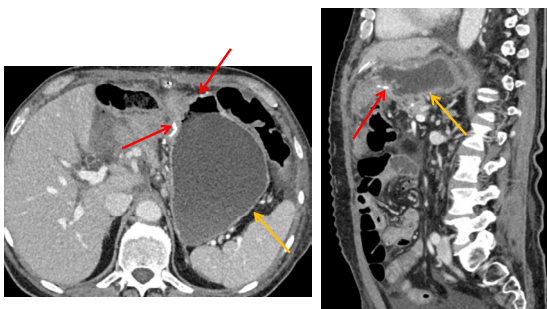
Case 5

- Pancreatoduodenectomy (Whipple procedure) 10 days ago
- Now pain, fever and secretion from laparotomy site

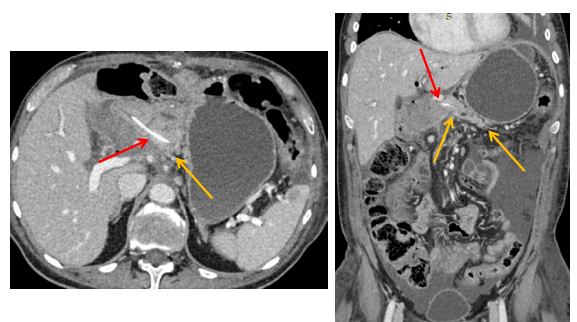
Answer: Leak from gastro-jejunal anastomosis with hematoma and pseudoaneurism in the common hepatic artery

Key concepts – 3 anastomosis in Whipple procedure

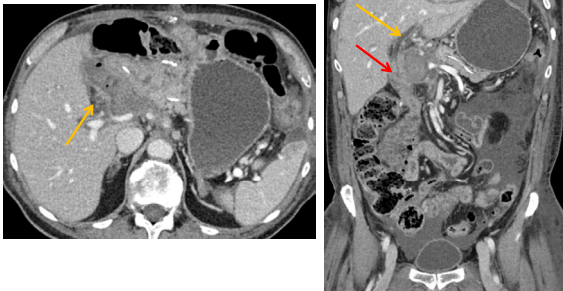
- Follow the stomach remnant to find **gastro-jejunal (G-J) anastomosis**, can be with stapler
- Follow the pancreas remnant- **pancreatico-jejunal (P-J) anastomosis**, usually with a thin catheter in the pancreatic duct and anastomosis, no stapler
- Follow the common bile duct – **hepato-jejunal (H-J) anastomosis**, close to liver hilum, no stapler



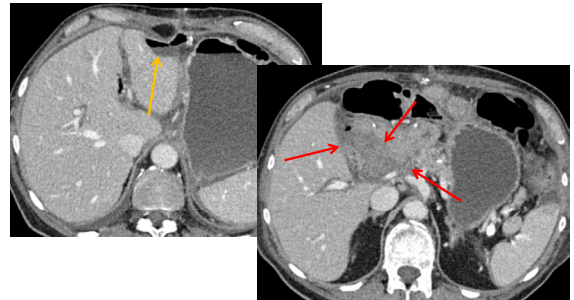
Gastro-jejunal anastomosis (red arrows), stomach remnant is a landmark (yellow arrow)



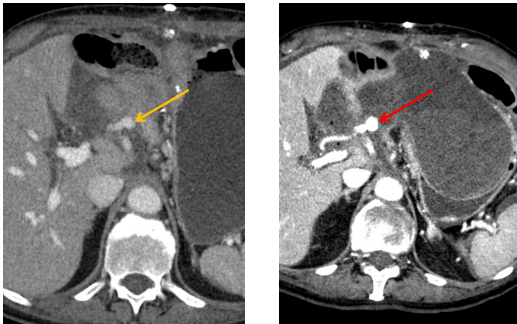
Pancreatico-jejunal anastomosis (red arrow), pancreas remnant with a thin catheter is a landmark (yellow arrow).



Hepatico-jejunal anastomosis (red arrow), common bile duct is a landmark (yellow arrow)



Air and fluid collection close to G-J anastomosis is suspected for a leak (yellow arrow) and it associated with a big hematoma in liver hilum that compresses small bowel loops (red arrow)



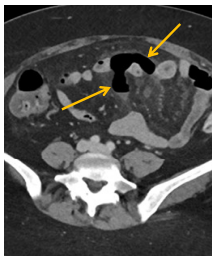
There is pseudoaneurysm of hepatic artery close to hematoma (yellow arrow), confirmed with CT angiography (red arrow)

Case 6

- Gastric bypass 2 days ago, complicated with peroperativ small bowel perforation, small bowel suture without resection
- Now abdominal pain, fever CRP > 200, leuk > 20
- Abscess? Perforation?

Answer: Small bowel perforation/ leak

Without oral contrast



With oral contrast



Air and fluid collection around small bowel (yellow arrow), suspicious for peroperative bowel perforation or a leak from non-opaque suture. Oral contrast has leaked into the collection after 2 hours confirming the diagnosis (red arrow)

Key Concepts

- Some small bowel sutures are opaque and some are not (surgeon preference), therefore clinical information about additional bowel injury and sutures is important
- Air, fluid and focal fat infiltration around bowel loops is a sign of bowel perforation or suture leak
- If oral contrast is used, adequate imaging timing must be chosen



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