Abdominal trauma CT

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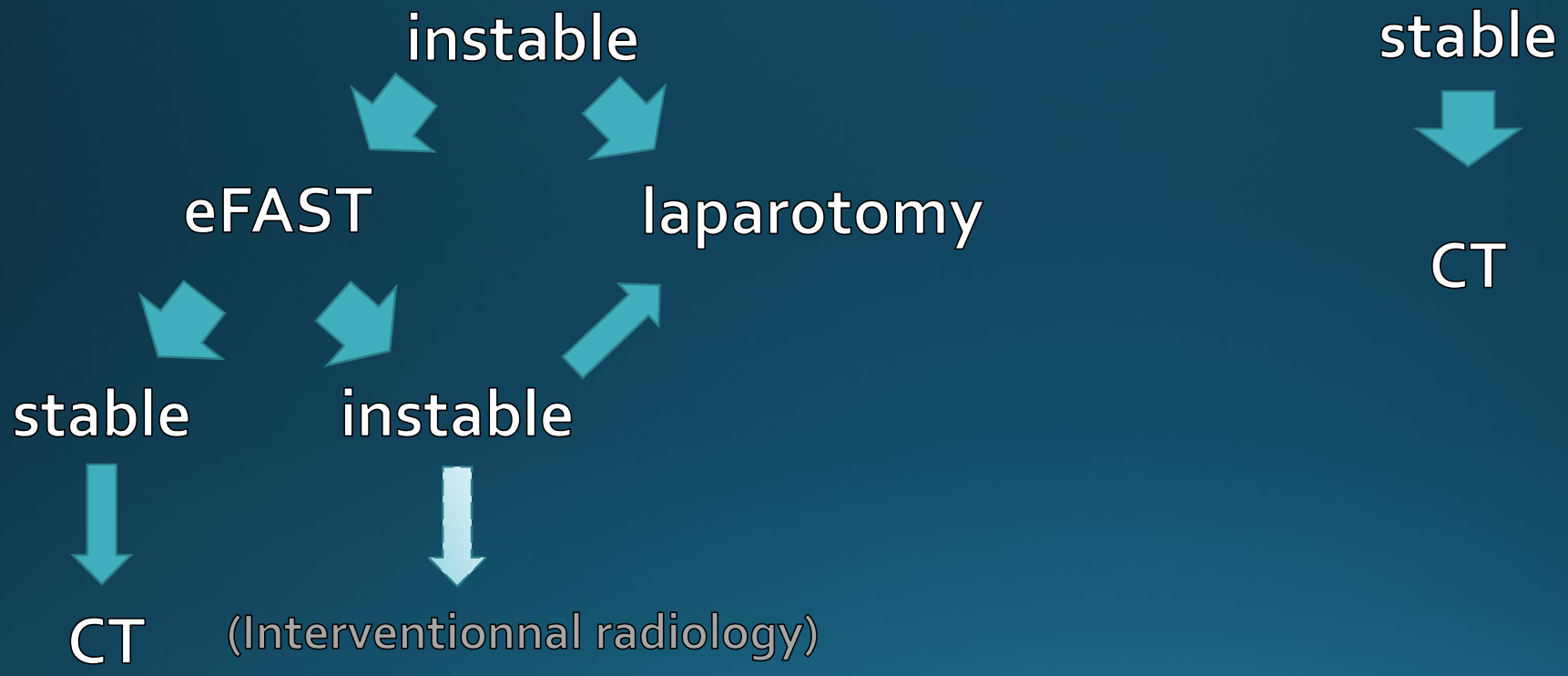
Mechanisms of Injury

Blunt >%

Penetrating

Trauma patient



Trauma patient

- CT is recommended for the evaluation of hemodynamically stable patients with equivocal findings on physical examination

TRAUMA ALERT CATEGORIES

Level I Trauma

A. Code Blue Patient
   1. Patient with traumatic mechanism is apneic and/or pulseless.

B. Code Red Patient
   1. Glascow Coma Scale < 13.
   2. Penetrating Injuries to the head, neck or trunk.
   3. Shock present.
      a. Systolic Blood Pressure < 90 at any point.
      b. In the pediatric patient, defined as:

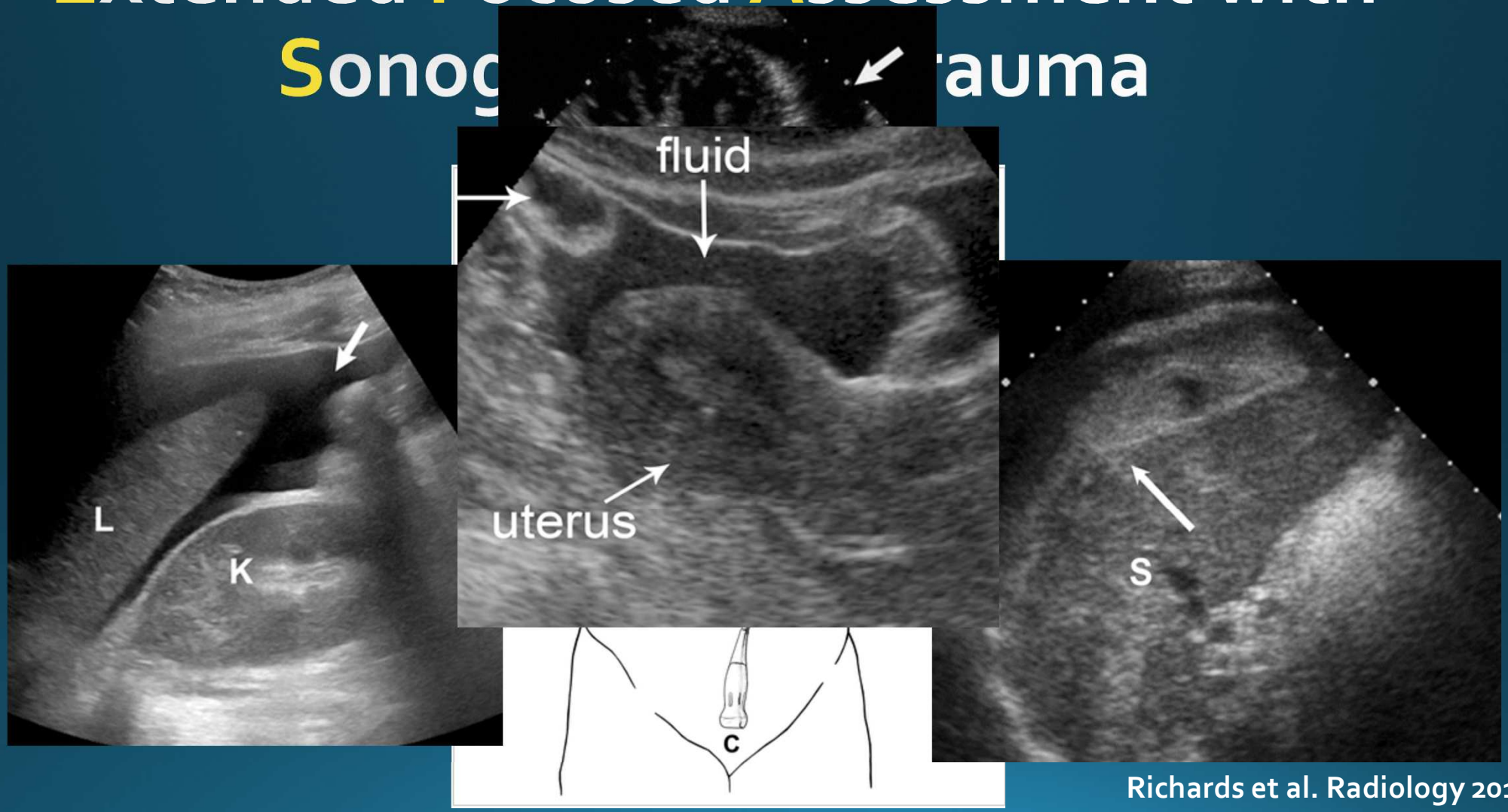
Age	SBP	HR
0-12 months	<70	<80 or >180
12-24 months	<75	<70 or >180
2-6 years	<80	<60 or >180
> 6 years	<90	<60 or >160

   4. Hangings and Drownings WITH near cardiac and/or respiratory arrest.
   5. Near cardiac and/or respiratory arrest with traumatic mechanism
      a. In the pediatric patient, defined as:

Age	RR
0-12 months	<10 or >60
12-24 months	<10 or >40
2-6 years	<10 or >50
> 6 years	<10 or >30

   6. Patients requiring endotracheal intubation who have not been stabilized by a provider at another facility.

Extended Focused Assessment with Sonog rauma



Richards et al. Radiology 2017

Thoracoabdominal CT

CT abdomen –C

+ for blood

T-A CT 25″and 70′

Urinary tract lesions→ late phase
Splenic lesions→ late phase

- for blood

T-A CT 70′

Thoracic trauma→ TA –C, 35″, 70″

Clinical Cases

Case 1

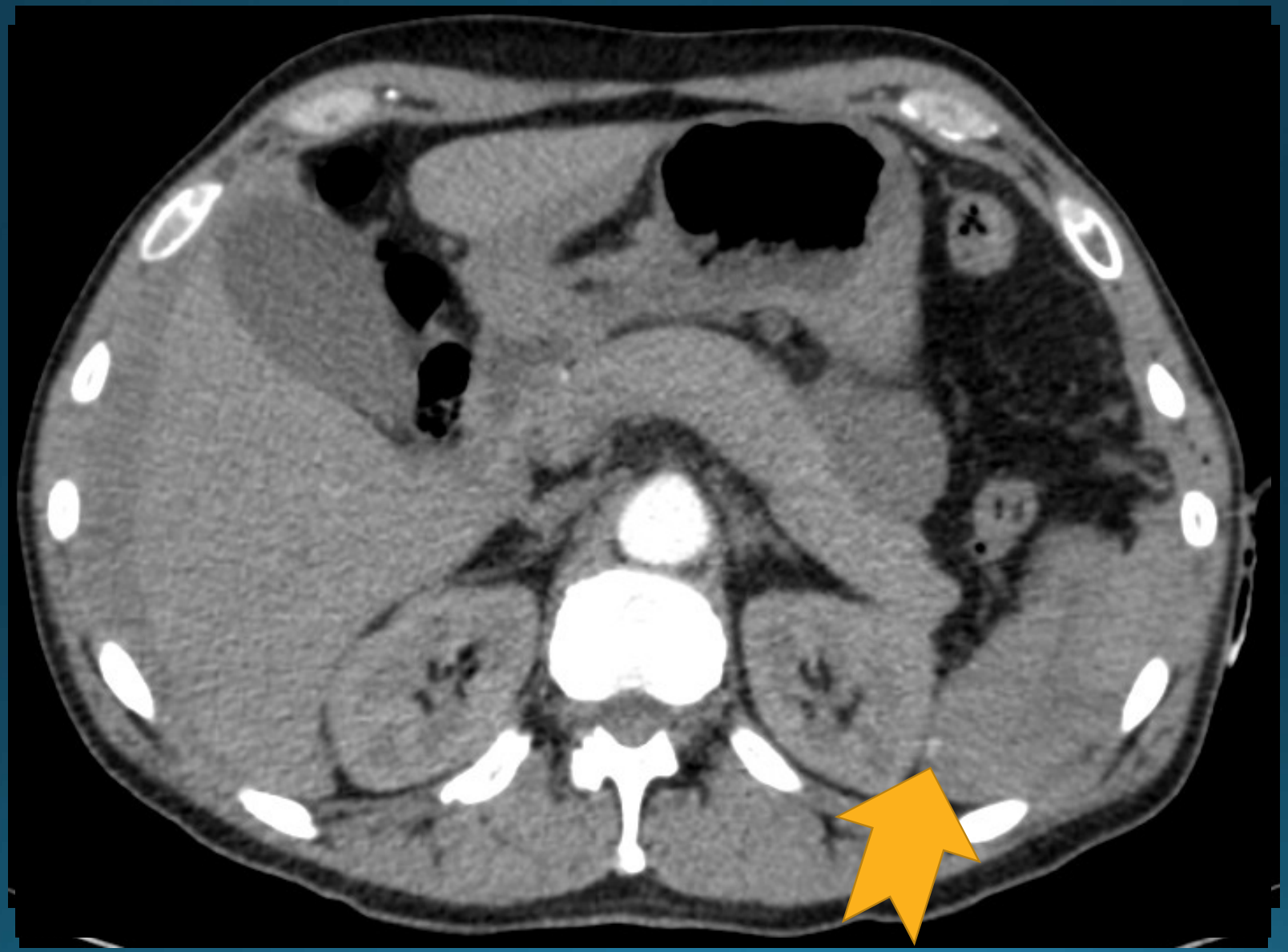
- Stab wound
- Male 30 y.o.
- Glaskow 6
- Stable

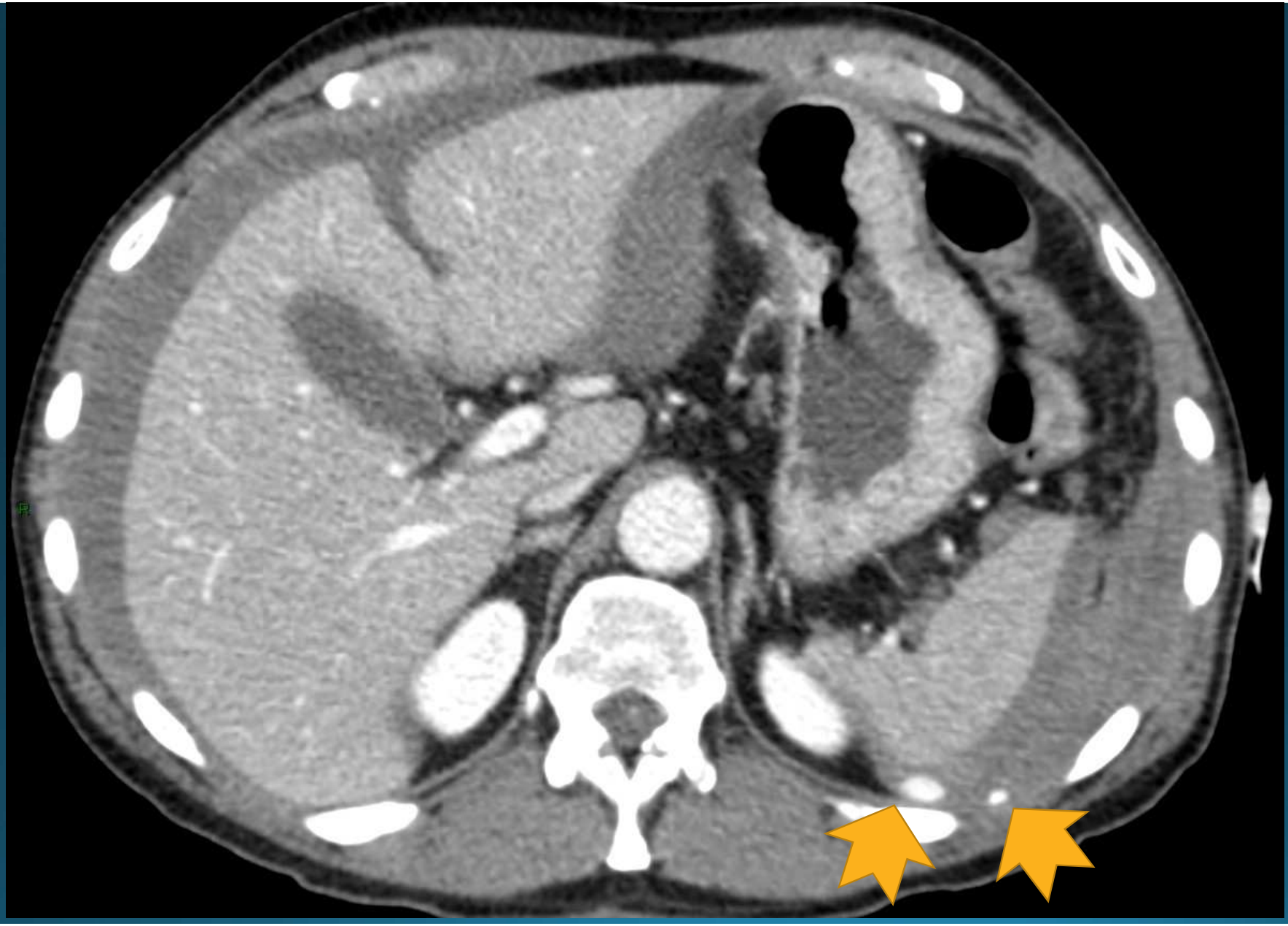

24UH
75UH

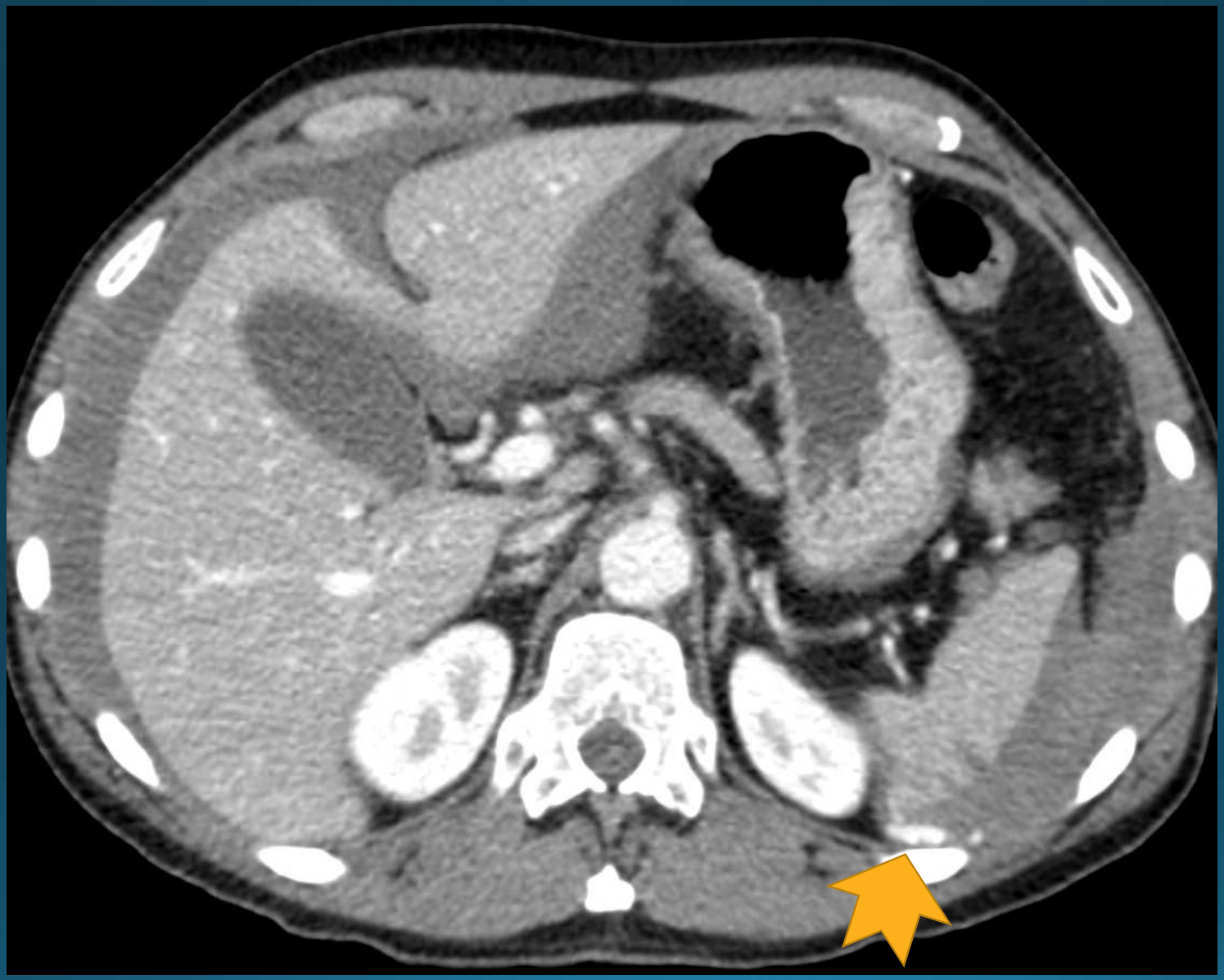
Sentinel clot sign

- « On CT, acute clotted haemorrhage typically has high attenuation (45 to 80 HU), whereas surrounding areas of acute nonclotted haemorrhage have either lower attenuation (25 to 45 HU) or fluid attenuation (0 to 20 HU) »

D Orwig and MP Federle 1989





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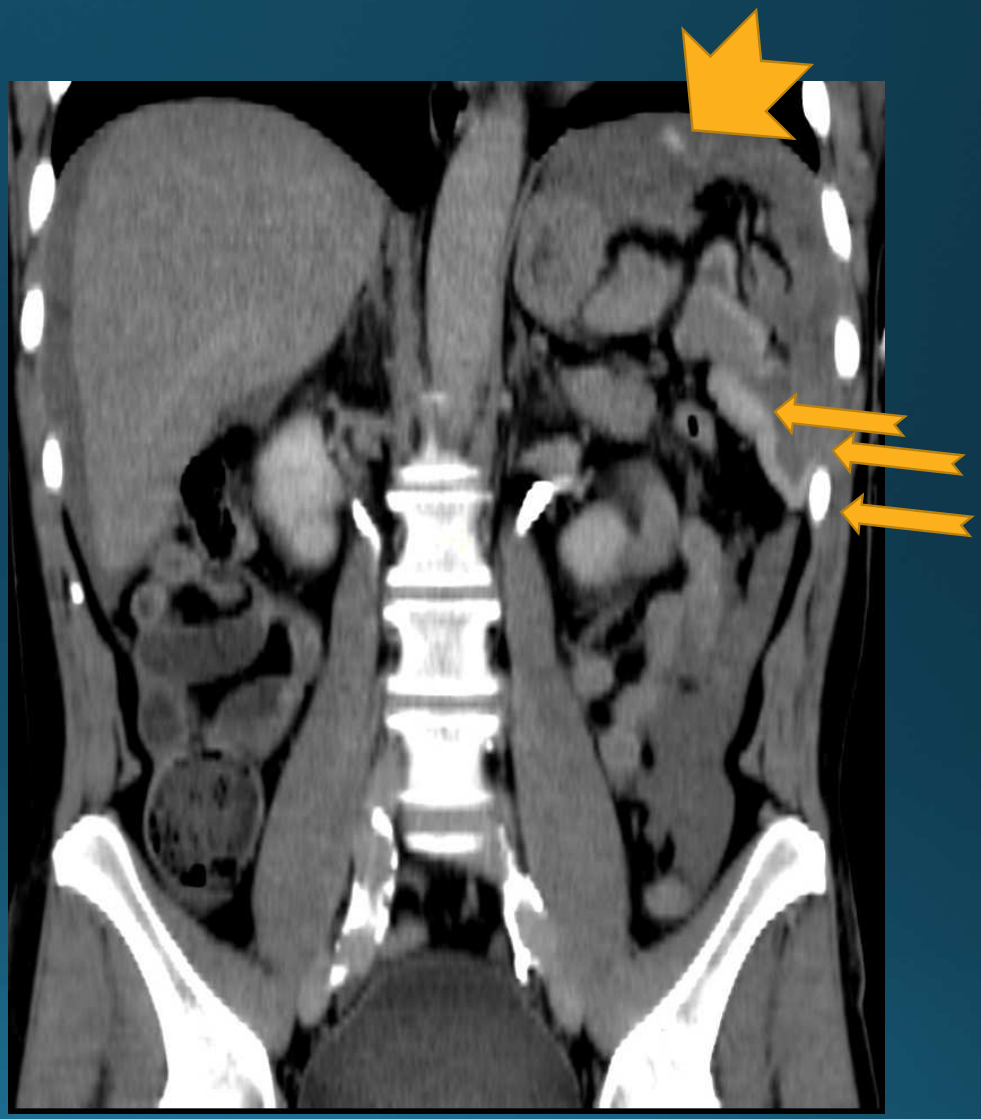
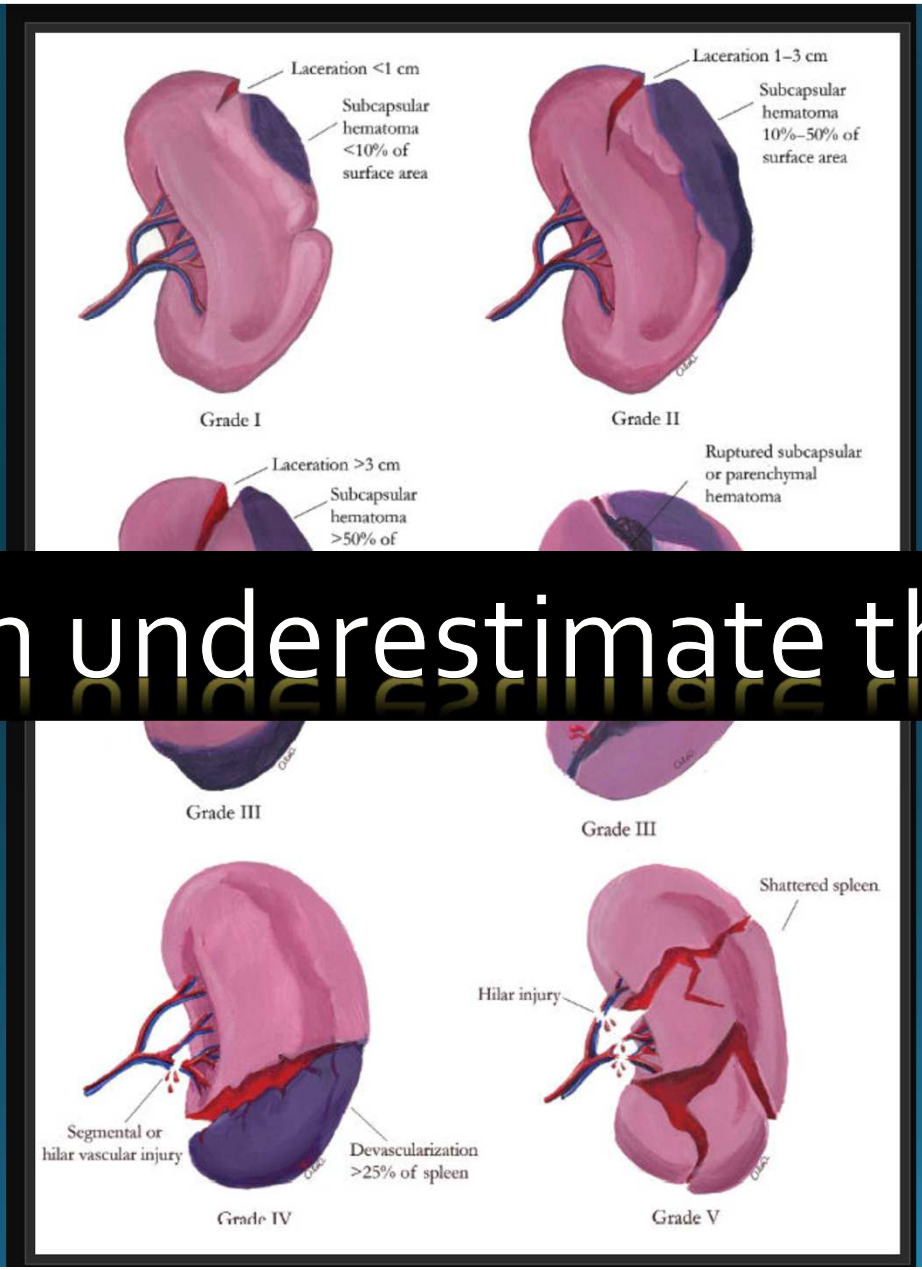




CT can underestimate the trauma

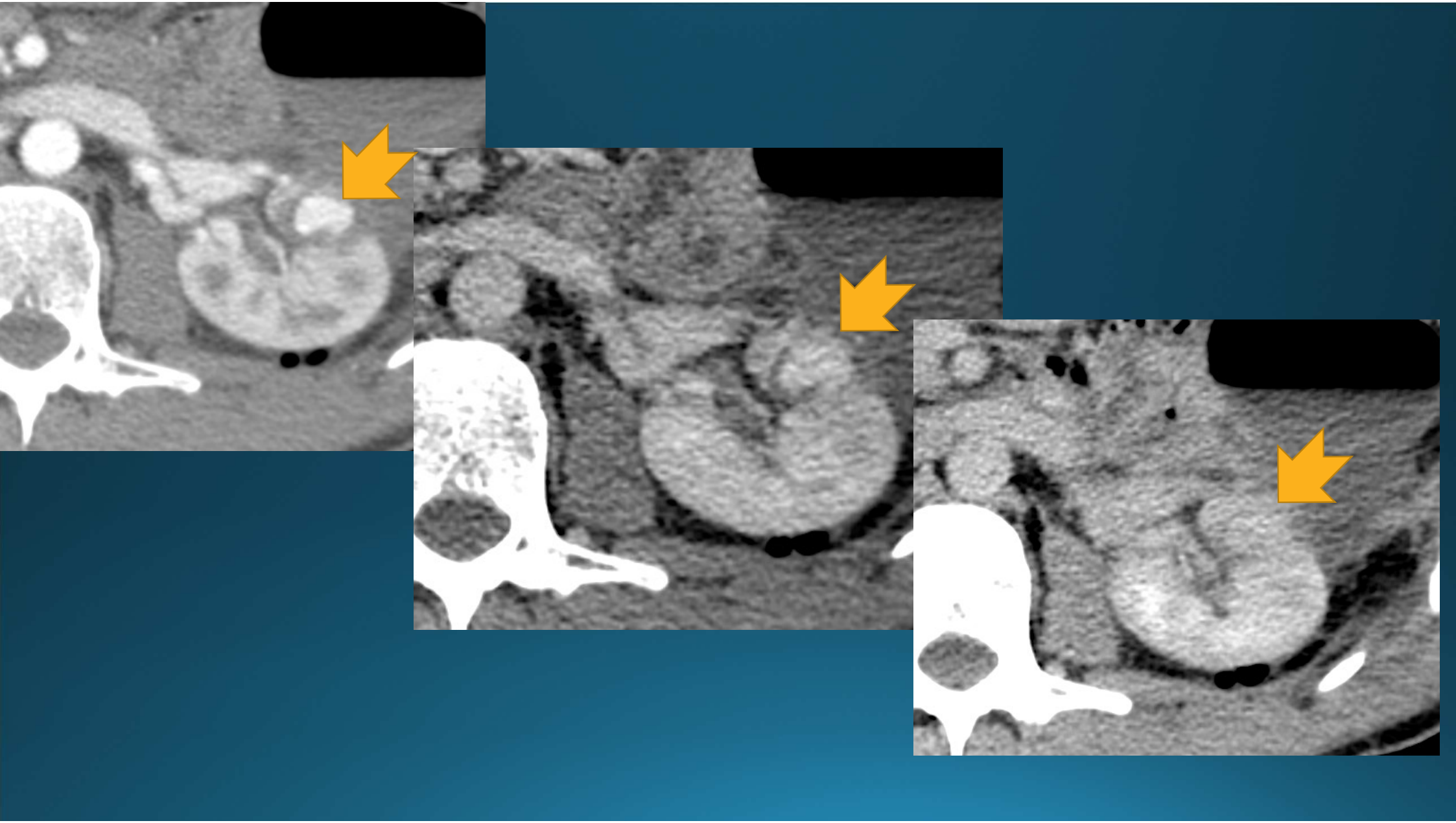
Active bleeding

- Contrast blush:
  area within ten HU compared to the nearby vessel (or aorta)
  -Active arterial extravasation
  -Post-traumatic pseudoaneurysm
  -Post-traumatic AV fistula

Table 1
Characteristics That Distinguish Active Extravasation from Pseudoaneurysm

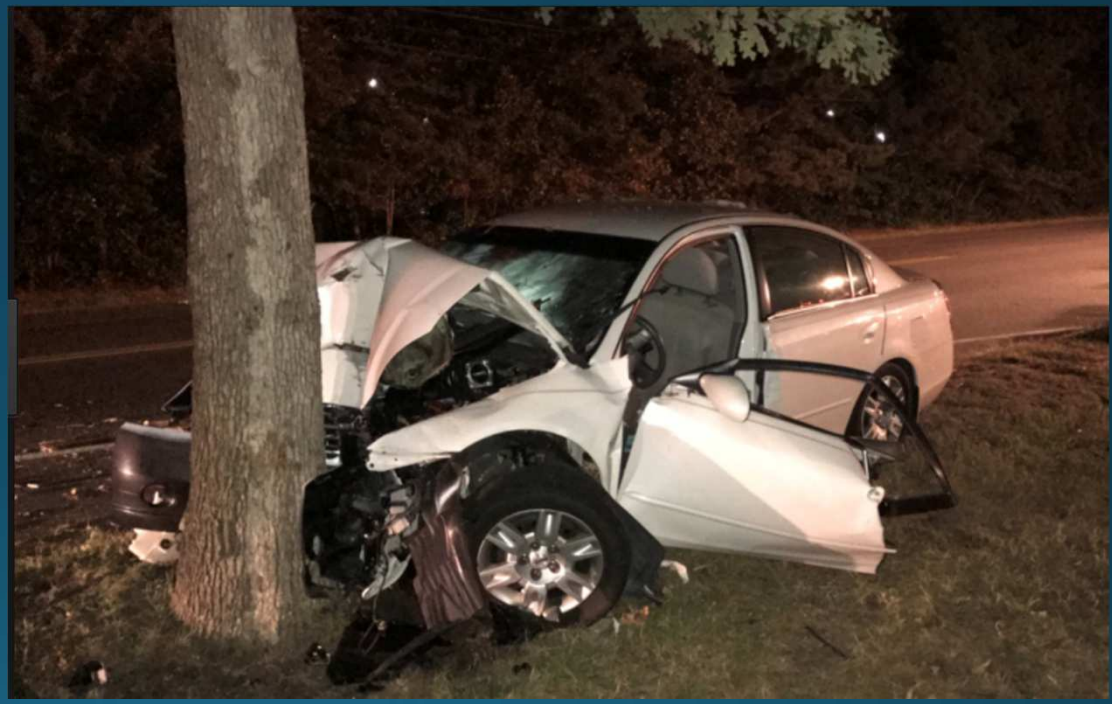
Distinguishing Characteristics	Active Extravasation	Pseudoaneurysm
Edges	Ill-defined	Defined
Shape	Commonly a jet (linear or layering); may be a diffuse or focal area of hyperattenuation	Often round or oval; possible neck that adjoins the finding to the adjacent artery
Delayed appearance	Increased attenuation or size of hematoma; possible layering	Less apparent on delayed images; in isolation, no change in hematoma
Management	Urgent embolization or surgery is required if significant injury is present	Urgent or ambulatory embolization or surgery is required if significant injury is present

Hamilton et al., 2008



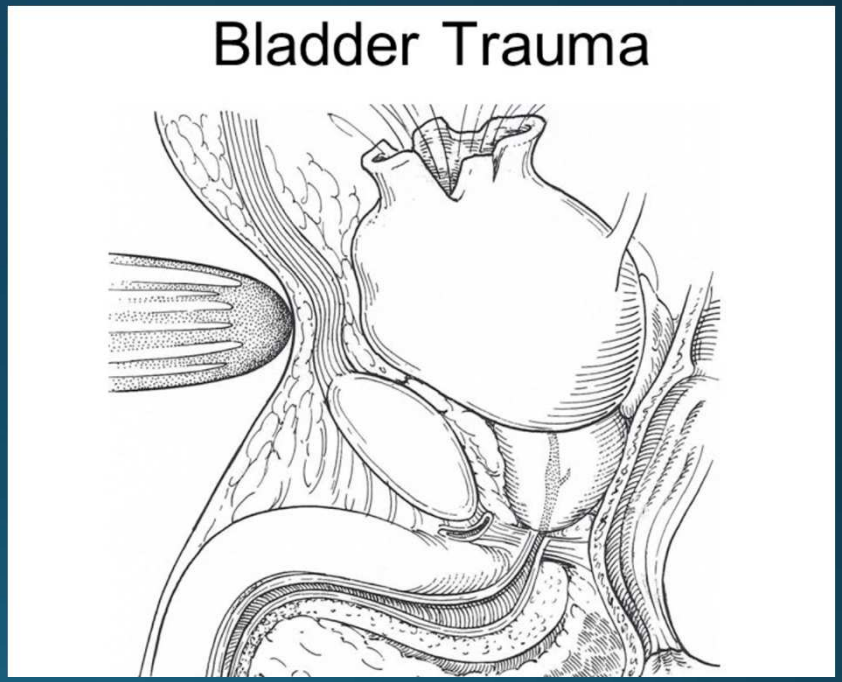
Case 2

- Car crash
- Female 18 y.o.
- pelvis unstable
- Glaskow 9



Bladder trauma

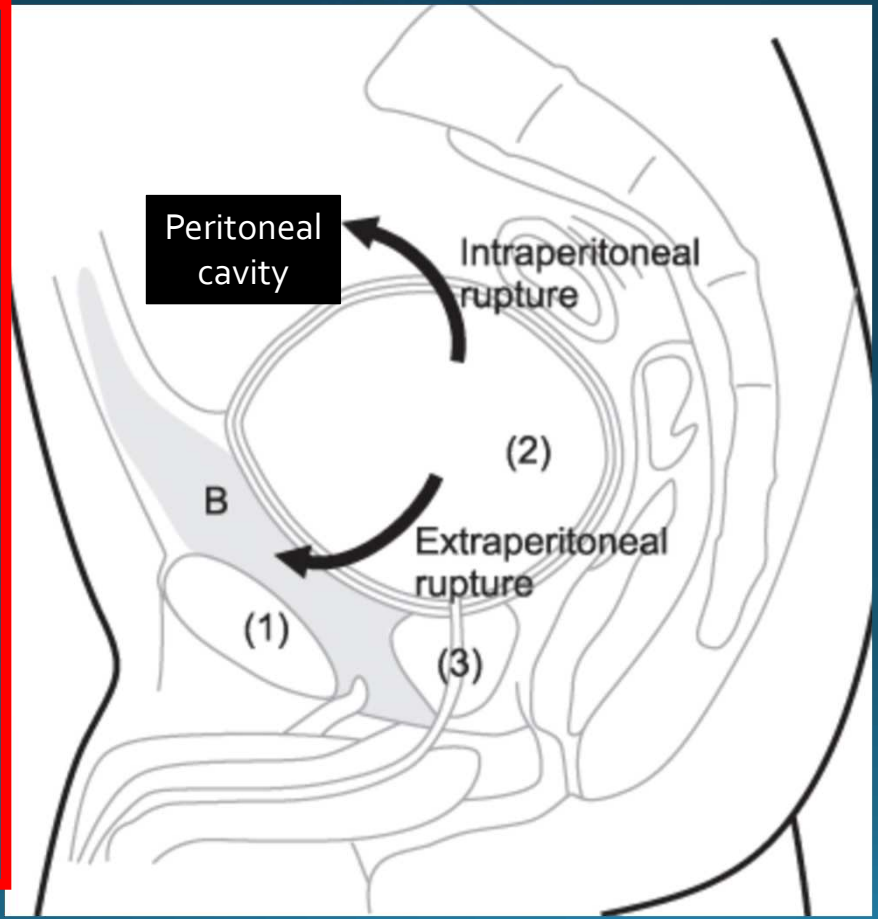
- Rare
- Blunt > penetrating
- Often associated with urethral injuries and pelvic fracture



2 types

Extraperitoneal

- Almost always associated with pelvic fractures
- Usually close to base of bladder anterolaterally
- Subdivided into
  - Simple, with extraluminal contrast limited to perivesical space
  - Complex, with extraluminal contrast extending to thigh, scrotum or perineum



Peritoneal

- Results from trauma to lower abdomen when bladder is distended (bladder dome is weakest portion, it ruptures most easily)
- Contrast is then seen in the paracolic gutters and between loops of small bowel

Always delayed phase after operation that could harm the ureters!!!!

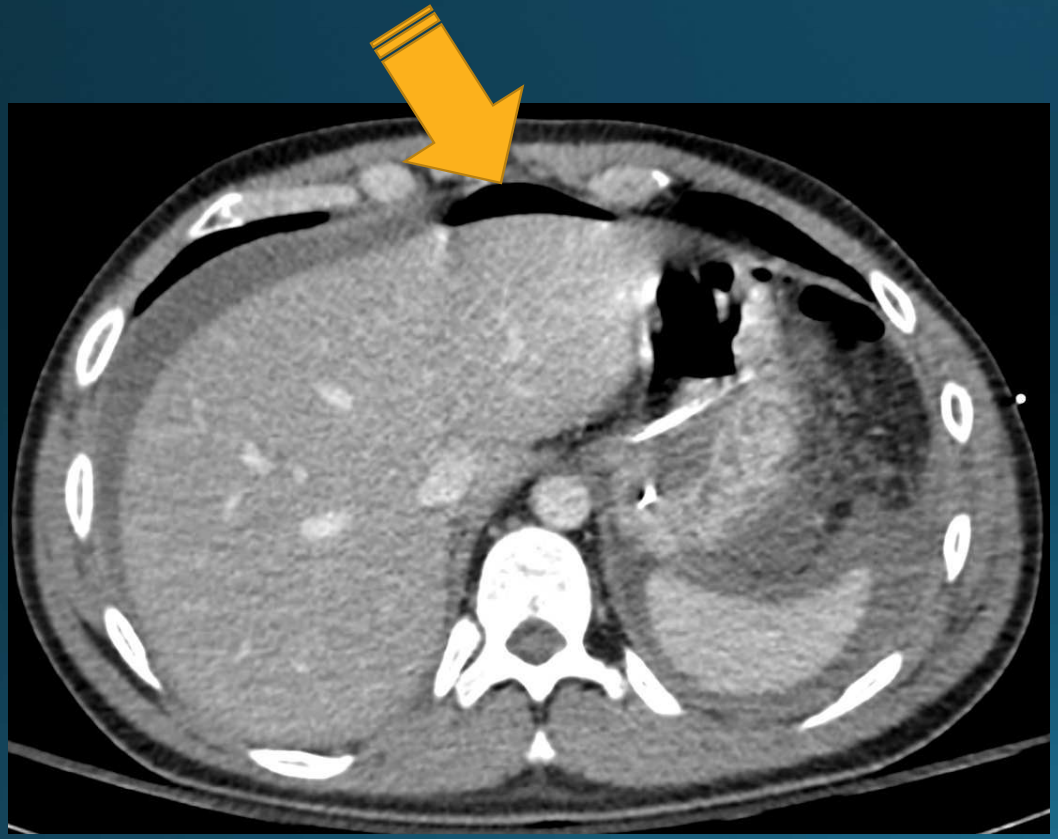
- Gynecological operations
- Bricker
- .....

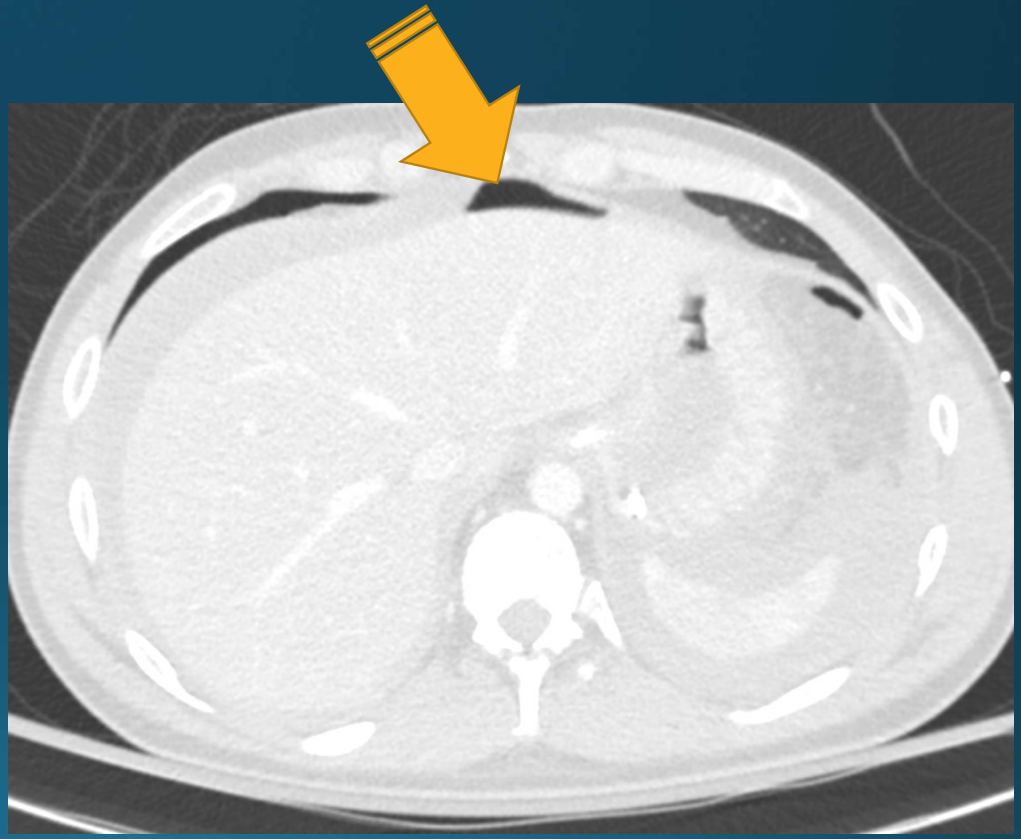
1 hour later….

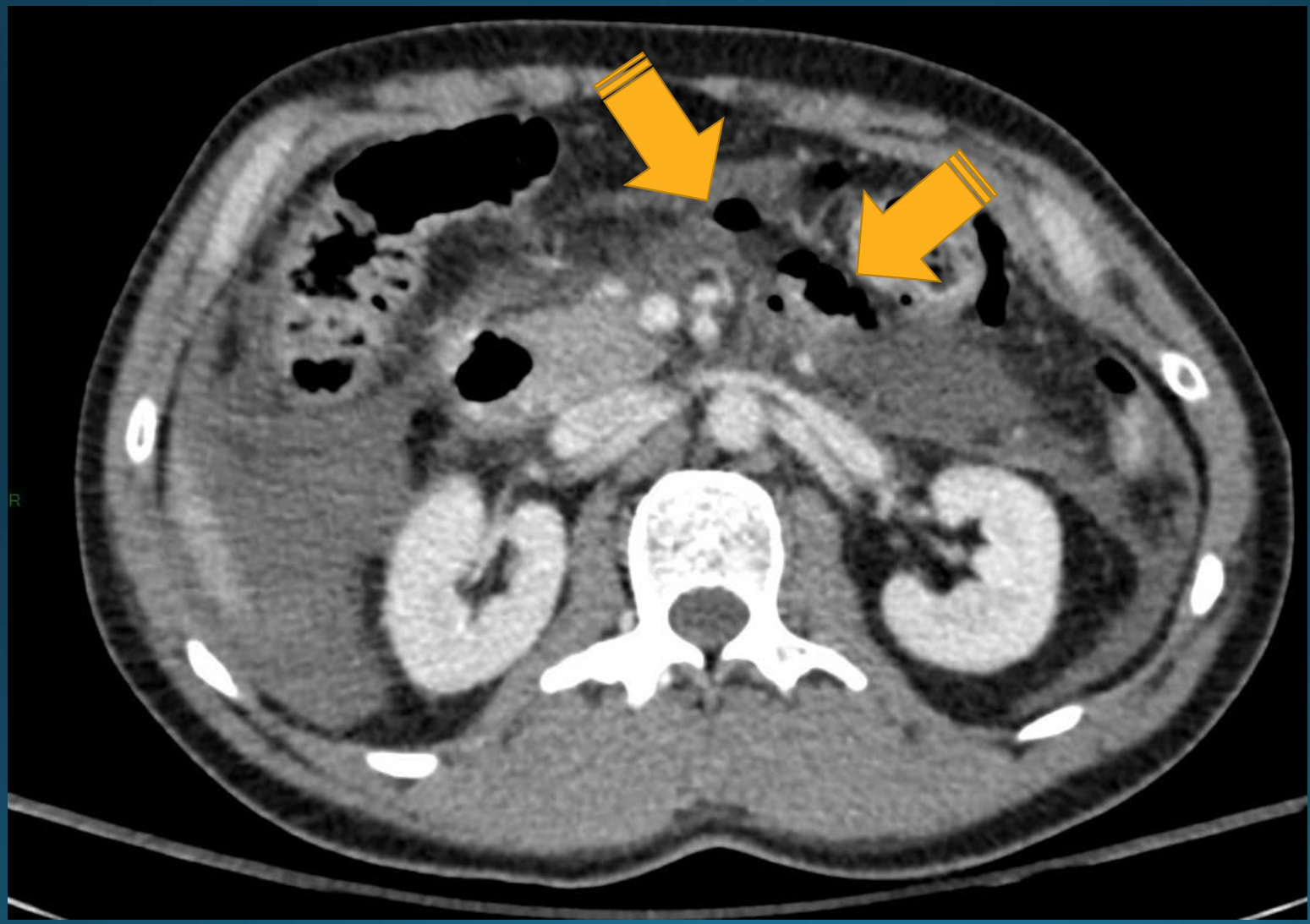
Case 3

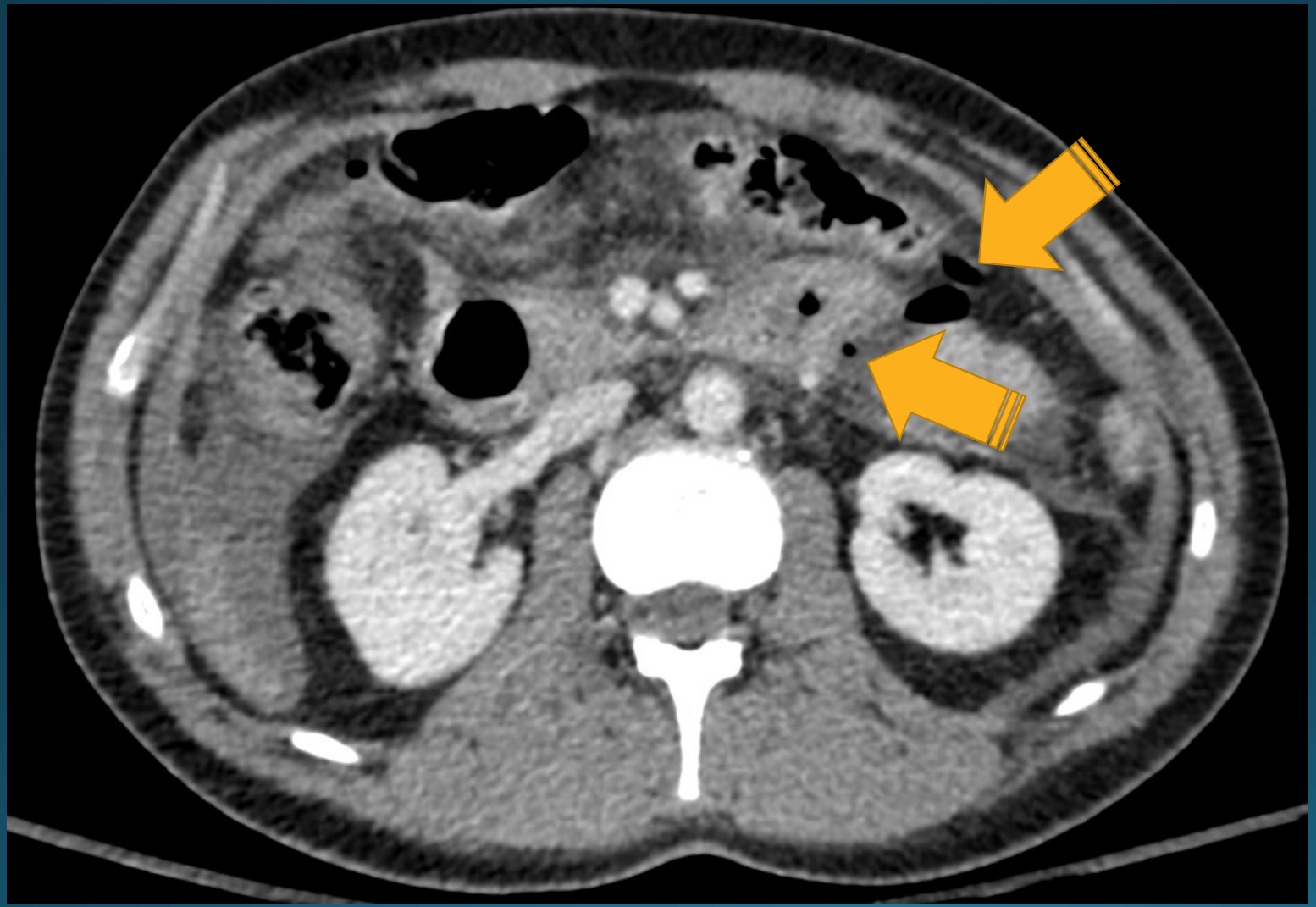
- Bike crash
- Male 25 y.o.
- pelvis stable
- Glaskow 12

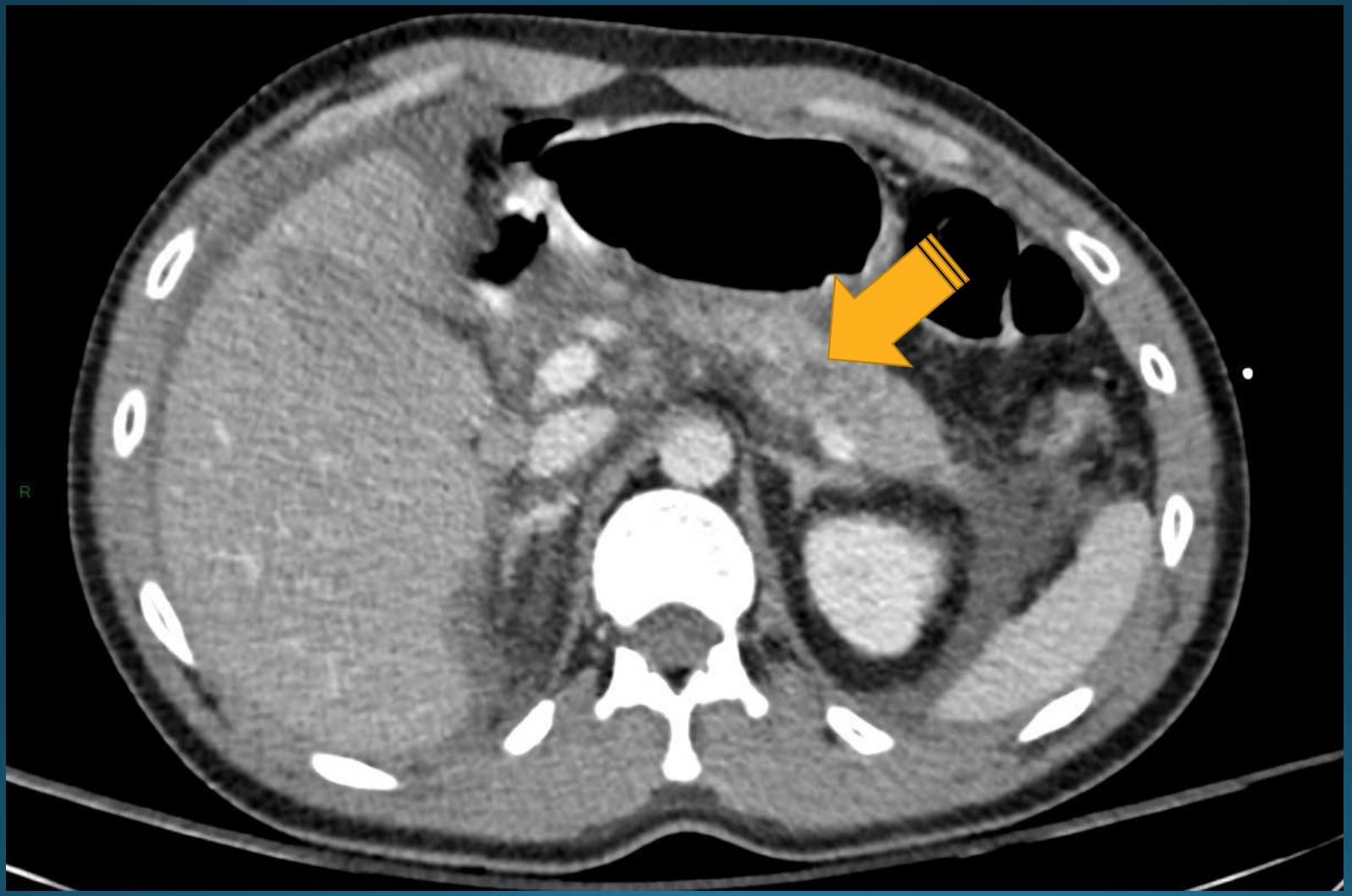
PNEUMOPERITOINE ET INFILTRATION DU RETROPERITOINE

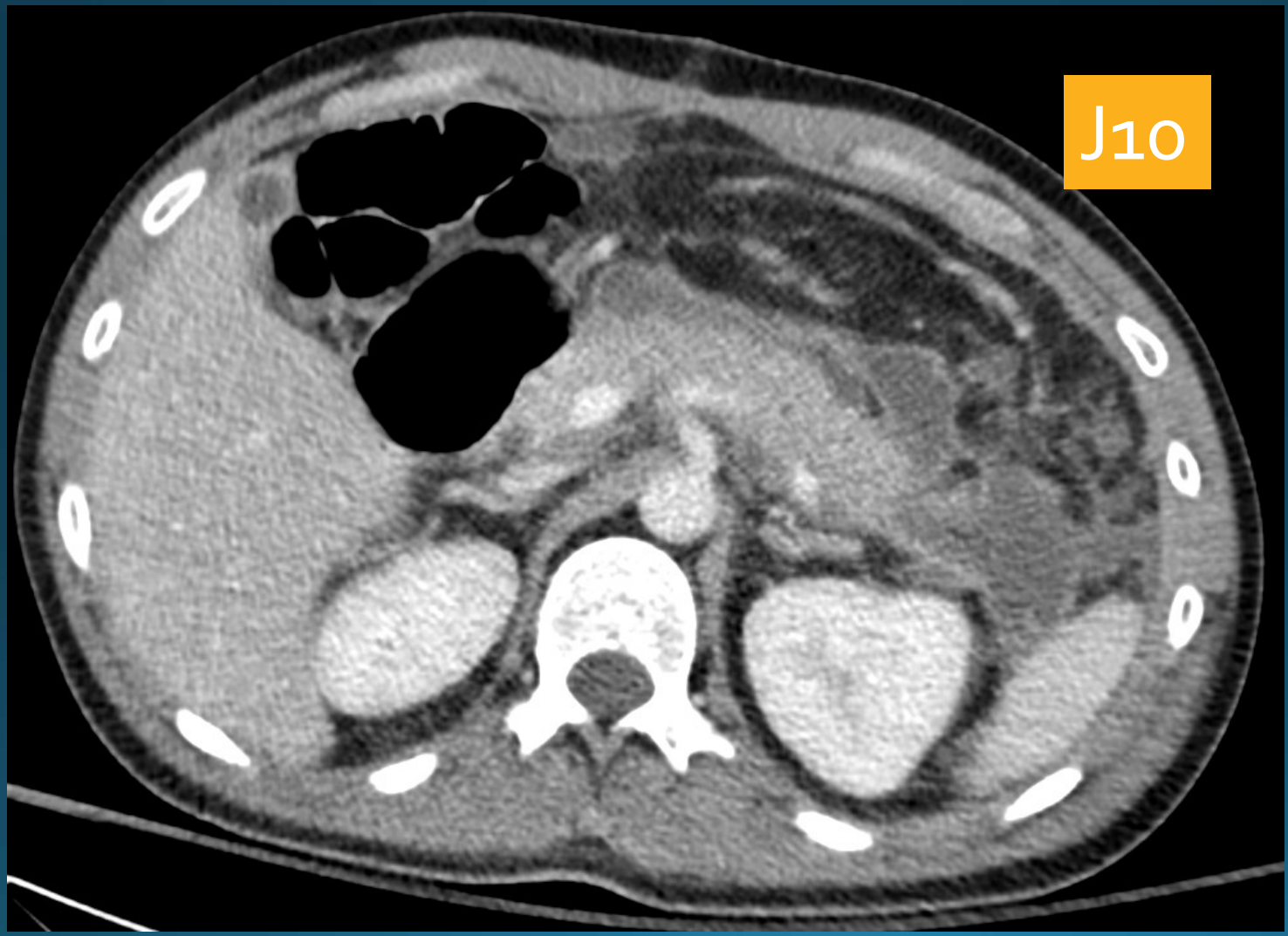




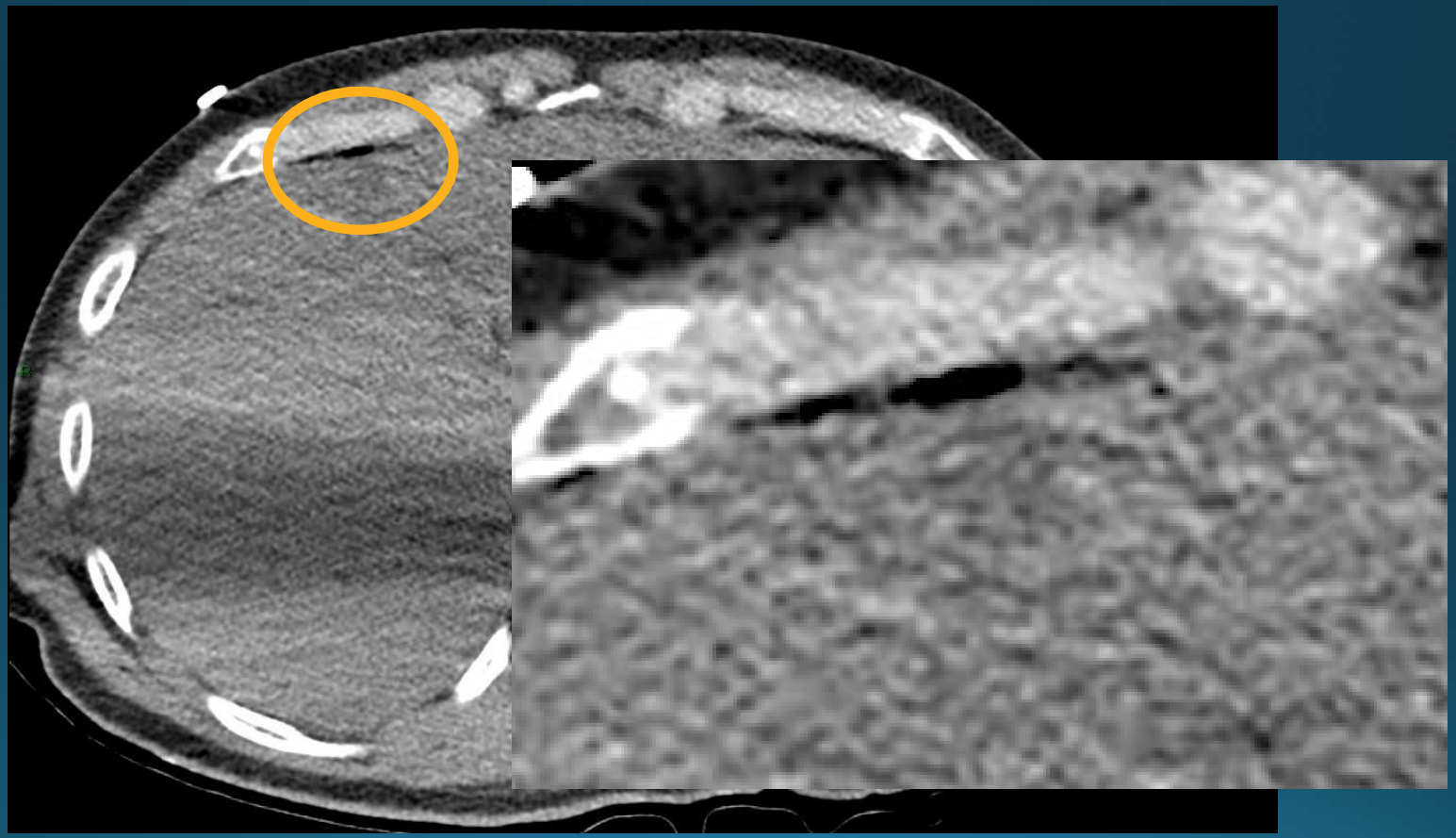







J10

A posteriori....



Pneumoperitoneum

- Always look for air!!!

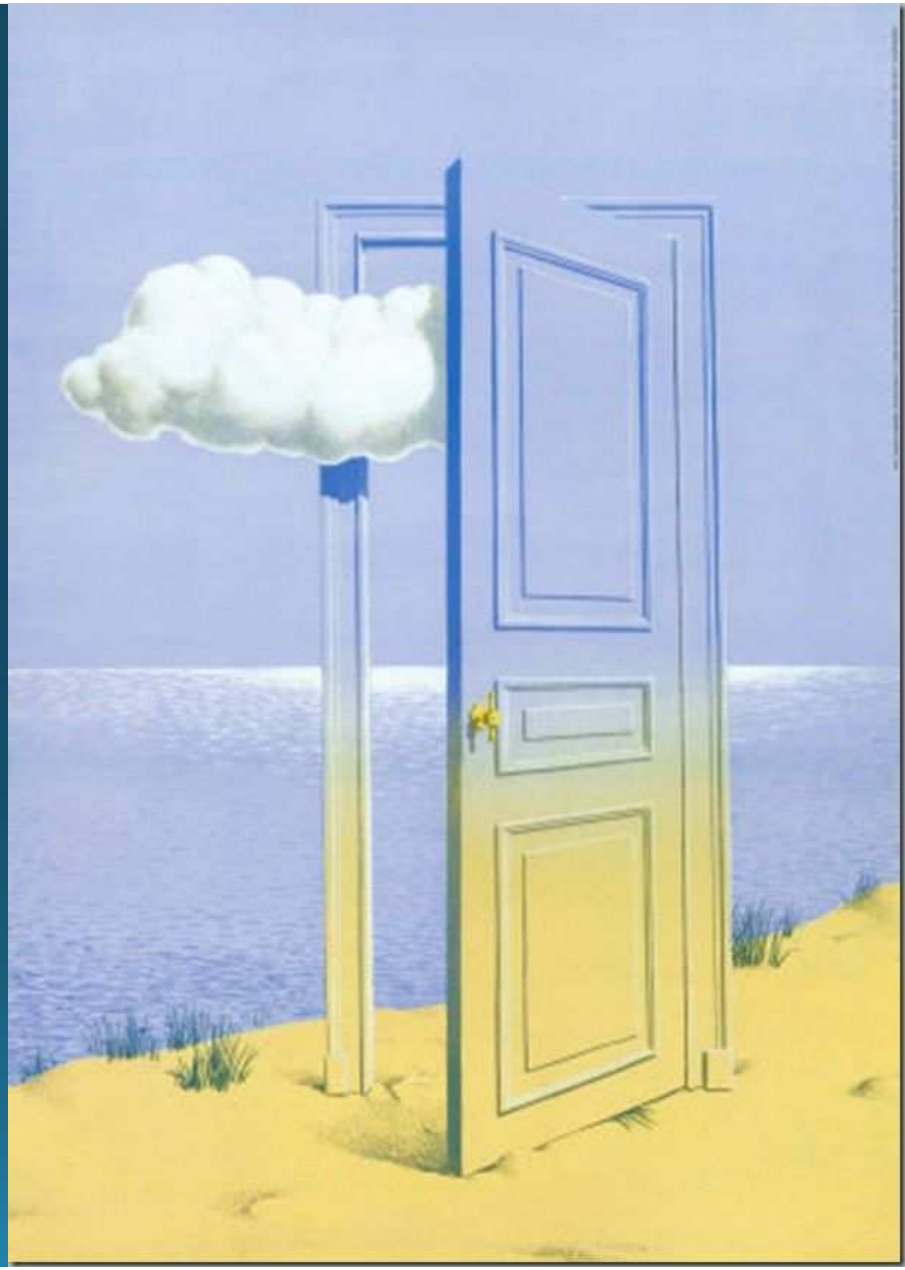
- Retroperitoneal infiltration→ PANCREAS!
- <2% of blunt trauma
- high morbidity and mortality in cases of delayed diagnosis, incorrect classification of the injury, or delays in treatment
- The pancreas may appear normal in 20%-40% of patients when CT is performed within 12 h after trauma

Debi et al., 2013

Traumatic injury to the pancreas is rare and difficult to diagnose. In contrast, traumatic injuries to the liver, spleen and kidney are common and are usually identified with ease by imaging modalities. Pancreatic injuries are usually subtle to identify by different diagnostic imaging modalities, and these injuries are often overlooked in cases with extensive multiorgan trauma. The most evident findings of pancreatic injury are post-traumatic pancreatitis with blood, edema, and soft tissue infiltration of the anterior pararenal space. The alterations of post-traumatic pancreatitis may not be visualized within several hours following trauma as they are time dependent. Delayed diagnoses of traumatic pancreatic injuries are associated with high morbidity and mortality. Imaging plays an important role in diagnosis of pancreatic injuries because

Suspicion , lipases→ control !!!!

Thank you



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