SURGICAL MANAGEMENT OF BLUNT PANCREATIC TRAUMA

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BLUNT PANCREATIC TRAUMA

- Rare: 2 – 12% of all abdominal trauma
- Mechanism: sudden crushing force to the upper abdomen
- Often associated with significant associated intra- and extra-abdominal injuries
- Clinical signs and symptoms: non-specific or absent
- Lab findings: lipase > amylase

Diagnostic Imaging

Ultrasound (FAST)

- Commonly used, but inferior to CT for diagnosis/classification

CT

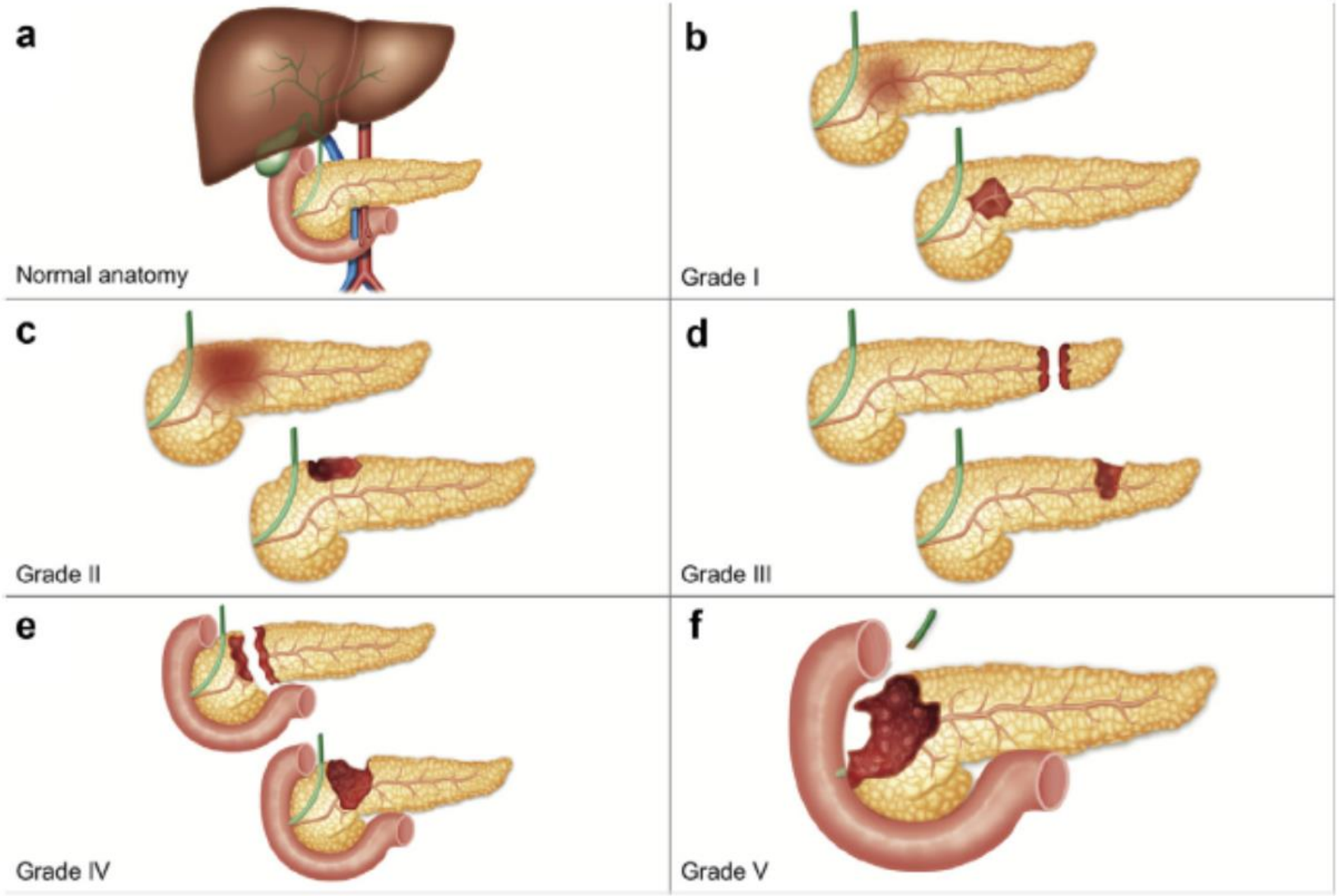
- Primary imaging modality
- Conventional CT low accuracy (43%) for Wirsung injury
- MDCT high accuracy for Wirsung injury (spec 91-100%, sens 91-95%)

MRCP

- Even more accurate for assessing integrity of the Wirsung

ERCP

- Highly accurate, though invasive


a
Normal anatomy
b
Grade I
c
Grade II
d
Grade III
e
Grade IV
f
Grade V

CLASSIFICATION

TREATMENT

Injury to the Wirsung is the key determinant in management

Grading	Injury	Description
Grade I	Hematoma	Mild contusion without duct injury
	Laceration	Superficial laceration without duct injury
Grade II	Hematoma	Major contusion without duct injury
	Laceration	Major laceration without duct injury or tissue loss
Grade III	Laceration	Distal transection or parenchymal injury with duct injury
Grade IV	Laceration	Proximal transection or parenchymal injury involving the ampulla
Grade V	Laceration	Massive disruption of the pancreatic head

Classification: American Association for the Surgery of Trauma (AAST)
-> Organ Injury Scale (OIS)

Consensus towards **non-operative management** of low-grade pancreatic injury **grade I-II**

Treatment of **high-grade (IV-V)** pancreatic trauma remains **controversial**, with recent trend towards more non-operative management

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Clinical presentation is important!

Table 1 Classification of pancreas injury into good, bad and ugly

Pancreas injury grade[a]	Physiology	Other injuries	Treatment	Risk of Morb.	Risk of Mort.	Classification[b]
Grade I–II	No shock	Absent	NOM ± drain	0–10%	<5%	Good
	Shock	Present		>10%	<10%	Bad
Grade III	No shock	Absent	NOM ± Resection	10–50%	<10%	
	Shock	Present		25–50%	10–20%	Ugly
Grade IV–V	No shock	Absent	Resection, staged	>50%	<20%	
	Shock	Present		>50%	20–50%	

Pancreatic Injury Mortality Score (PIMS)

Age>55 years	Points
Yes	5
No	0
Shocked	
Yes	5
No	0
Major vascular injury	
Yes	2
No	0
Number of associated abdominal injuries	
None	0
1	1
2	2
≥3	3
AAST pancreatic injury scale	
I	1
II	2
III	3
IV	4
V	5
Total Score	**x/20**

Risk Groups	PIMS score	Mortality estimates
LOW	0–4	Low <1%
MEDIUM	5–9	Medium 15–17%
HIGH	10–20	High 50%

Reproduced from Krige *et al.* [33] with permission from Pancreatology, Elsevier© 2017.

Late consequences of pancreatic trauma

- Pseudocysts
- Post-traumatic pancreatitis
- Pancreatic fistulae
- Abscesses
- Pancreatic strictures
- Peritonitis
- Gastro-intestinal bleeding
- Endocrine/exocrine insufficiency
- Pseudoaneurysms
- Splenic vein thrombosis

CASE 1: *GIRL, 8 YEARS OLD*

Cause: Bicycle handlebar injury

Diagnostics: Emergency ward peripheral hospital

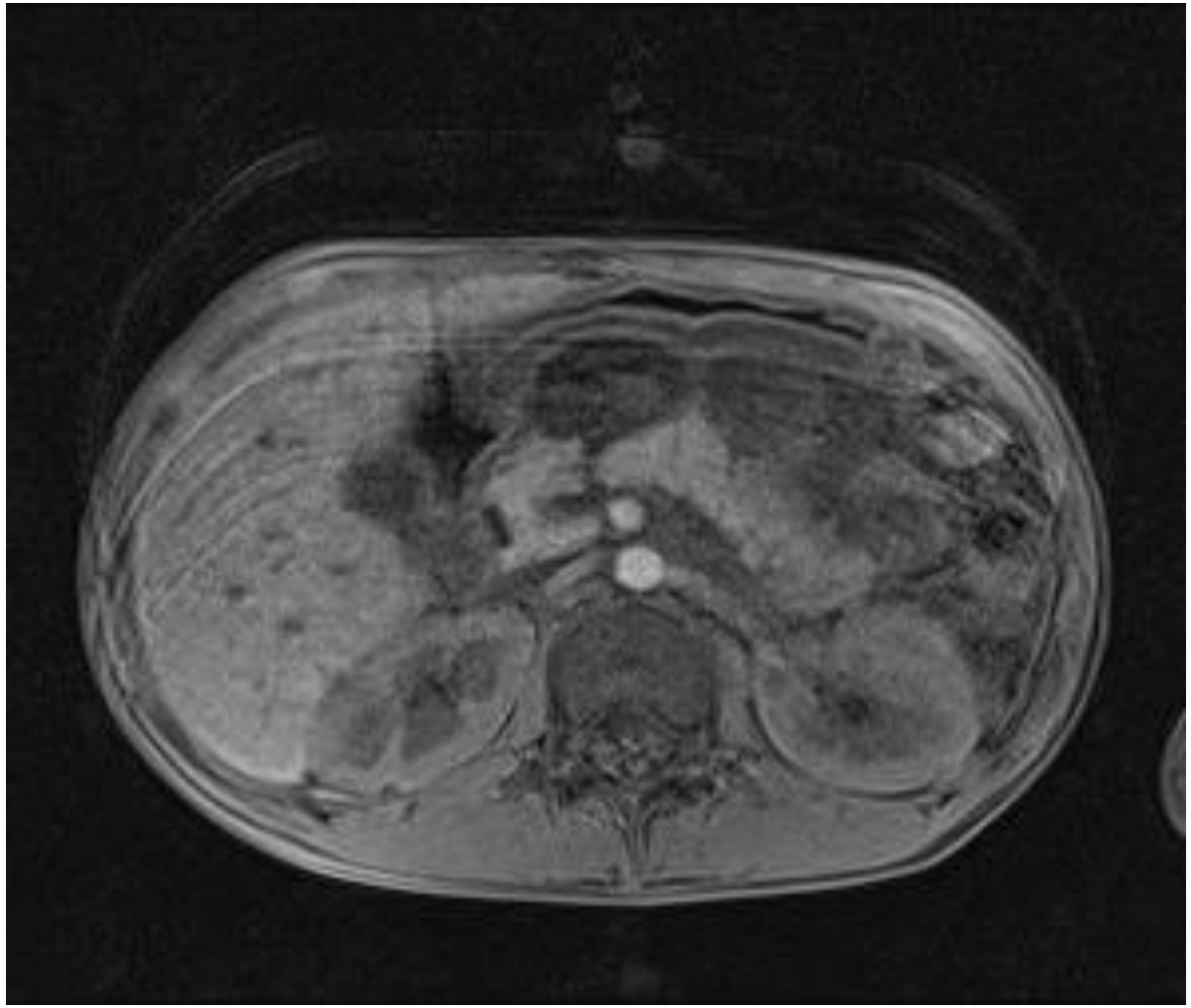
- Lipase: **3007** U/l
- US: Limited free fluid recto-uterine pouch
- **CT: Multiple clefts** between pancreatic head and neck: **AAST grade II**

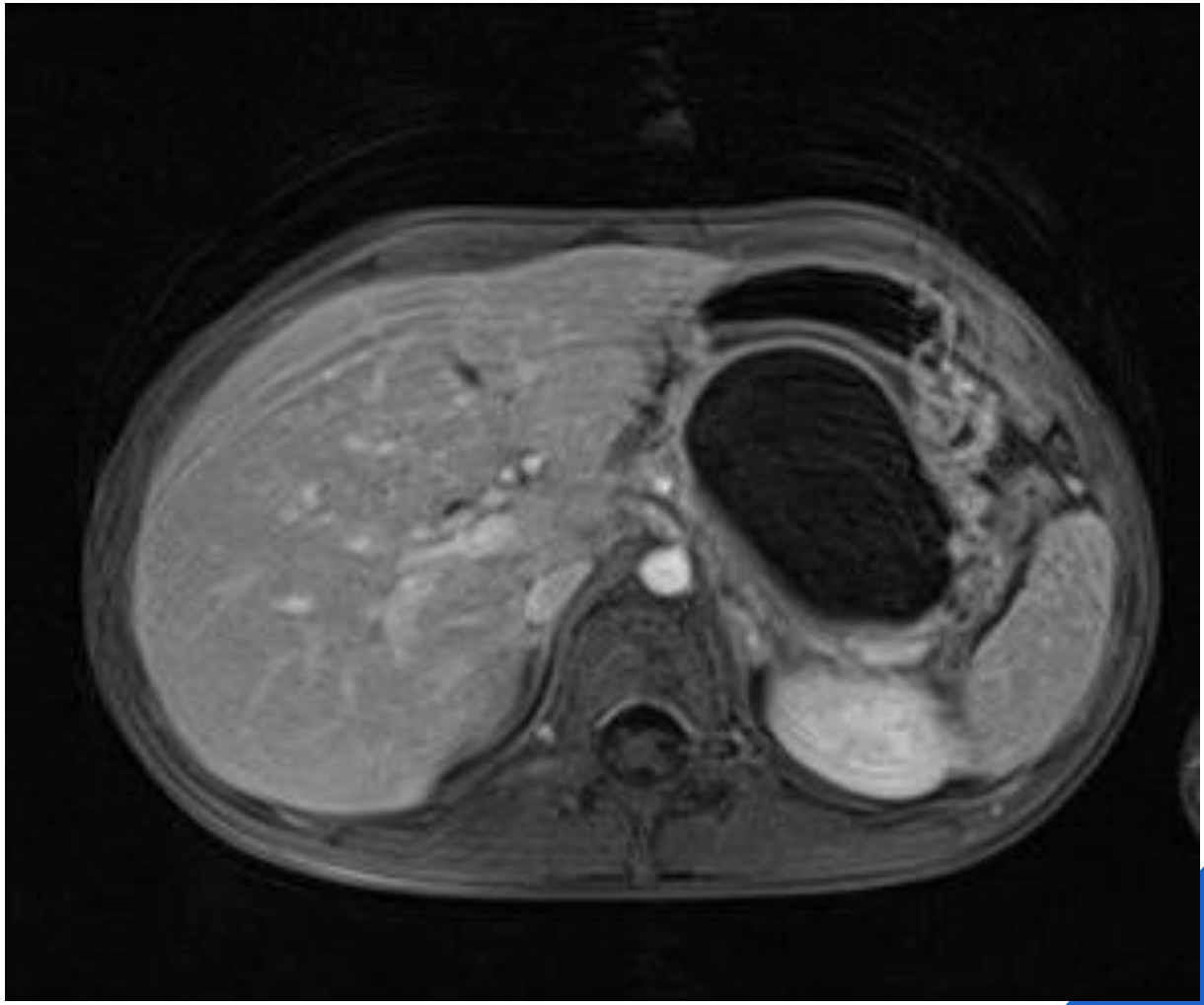
Initial treatment: 3 days nil per os

Clinical evolution

- D4: **Clinical deterioration ->** referral to UZ Gent
- D6: **MRCP**: laceration of pancreatic tissue, two pseudocysts compressing the stomach

CASE 1





Treatment: nil per os, antibiotics, octreotide

- D9: Discharge

Follow-up: 5 weeks after initial presentation -> **gastroscopic fenestration of 2 pseudocysts**

CASE 2: *MALE, 43 YEARS OLD*

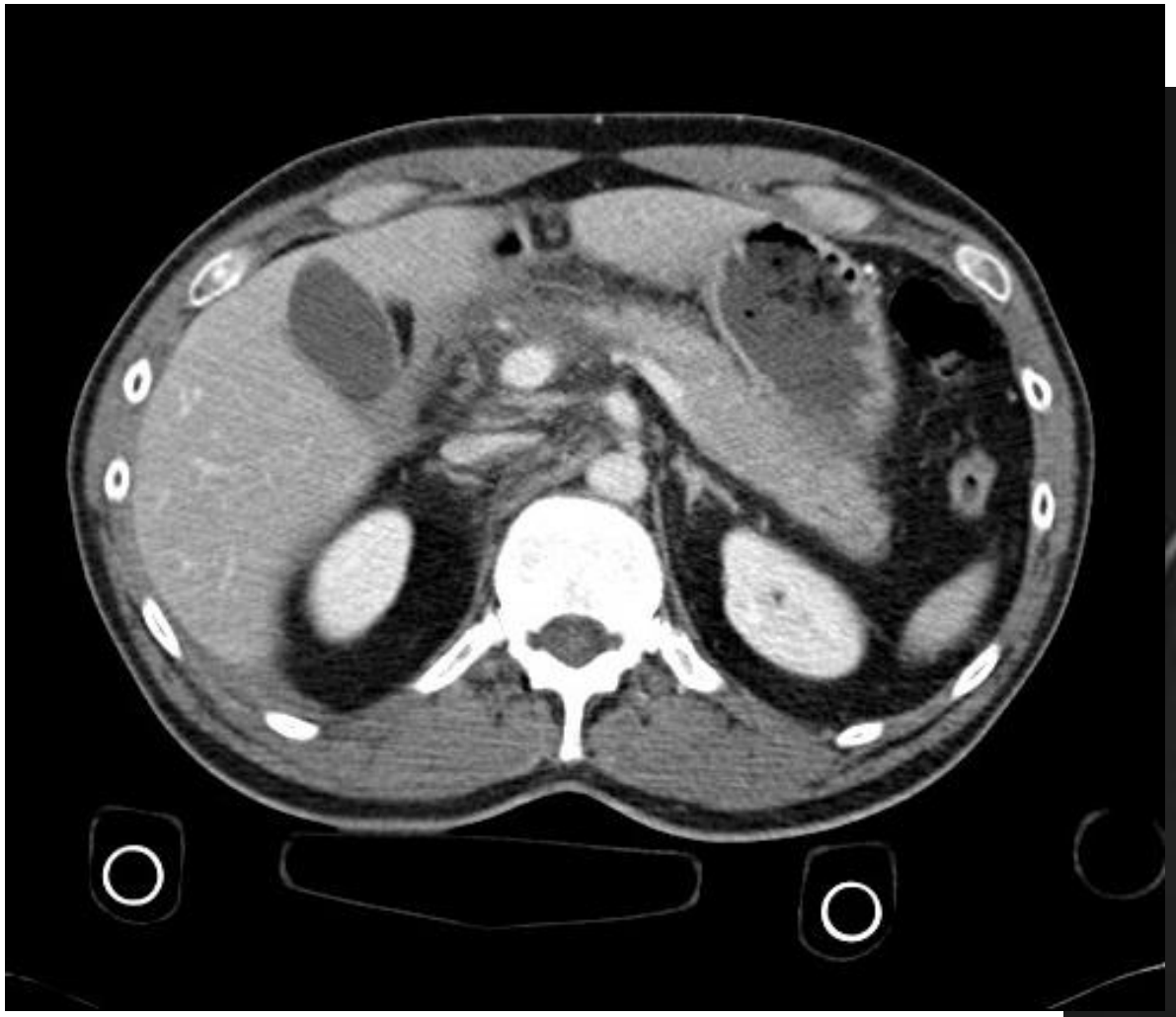
Cause: Motor vehicle accident

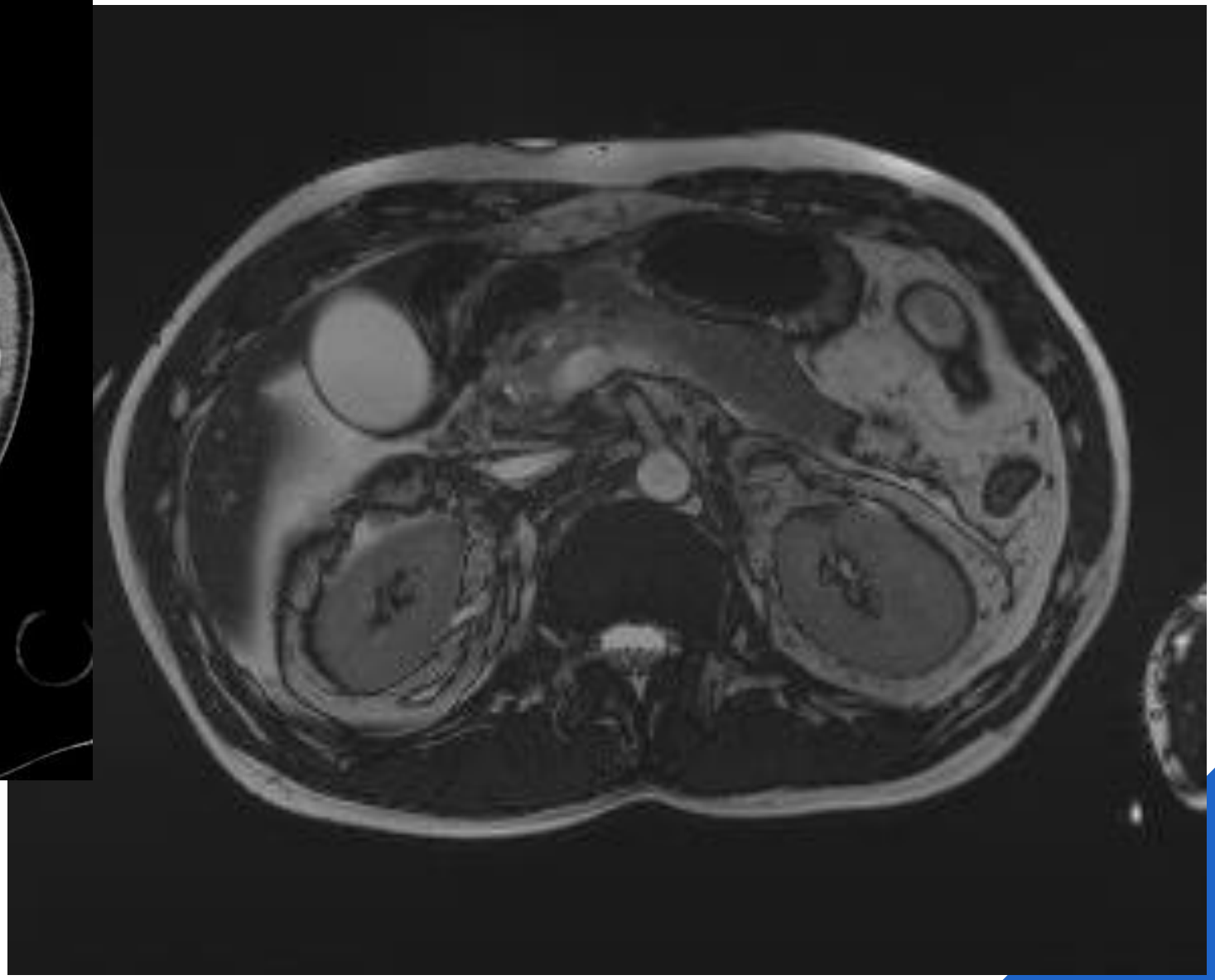
Diagnostics Emergency ward UZ Gent

- Lipase: **317** U/l
- FAST: Free fluid in the abdomen
- **CT:** Grade II liver hematoma segment II and IVb, **contusion of the pancreatic head** without clear margins around the Wirsung, fluid around mesenteric vessels and aorta, thickening of the duodenum
  - **AAST grade I**
- **MRCP:** contusion of the pancreatic head **without laceration** of the Wirsung

- **Persisting need for fluid resuscitation**……

CASE 2: *MALE, 43 YEARS OLD*





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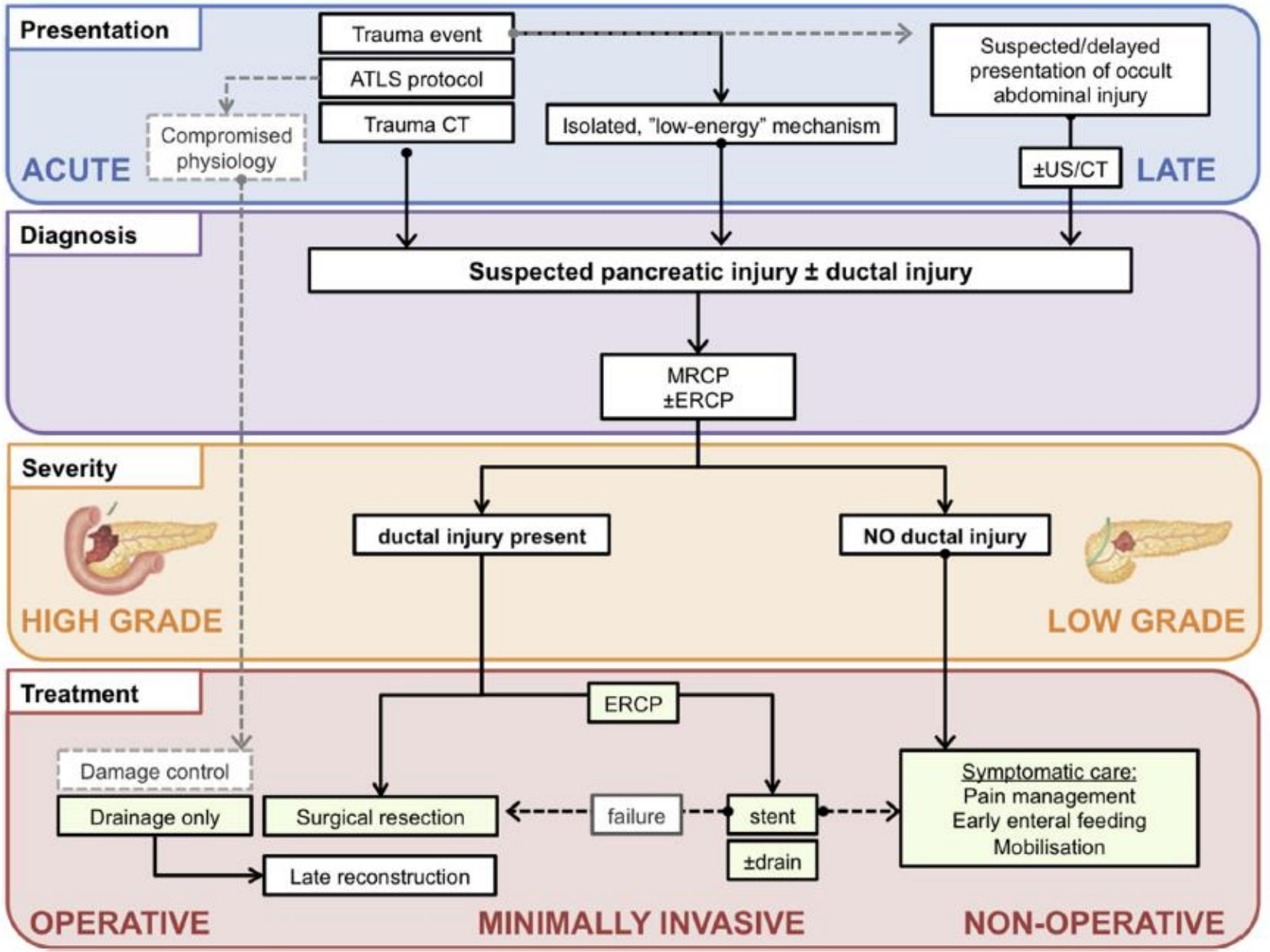
Treatment: D1 after presentation

- **Explorative laparoscopy** with drainage of a 500ml hematoma
- Antibiotics (augmentin), somatostatin, nil per os

Clinical evolution:

- Two days of ICU care, discharge after 18 days
- Further recovery was **uneventful**

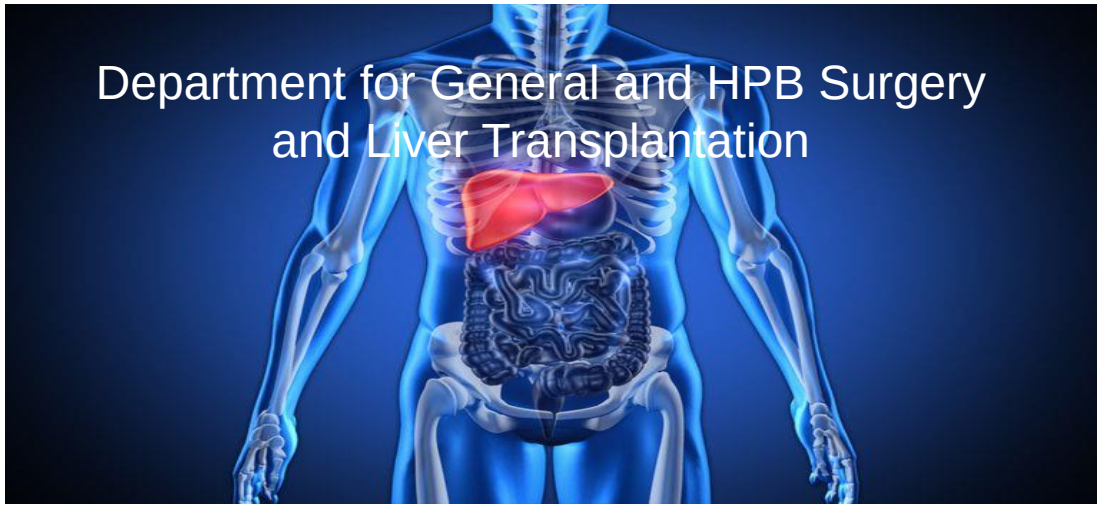


Soreide et al. HPB 2018

Conclusion

- Management of these patients depends strongly on both clinical condition and classification of trauma, as well as associated injuries
- In pediatric patients more isolated pancreatic injuries
- Endoscopy is the best initial option if clinical condition allows and expertise is present
- Damage control principles certainly apply to pancreatic trauma.

Thank you for your attention



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