How to treat pancreatic injuries

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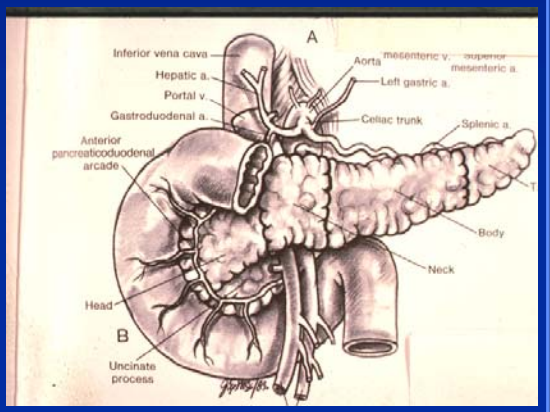
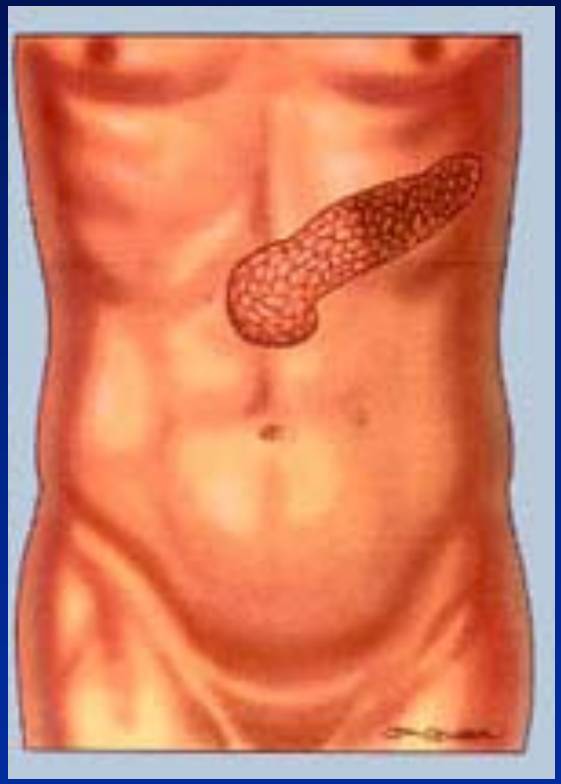
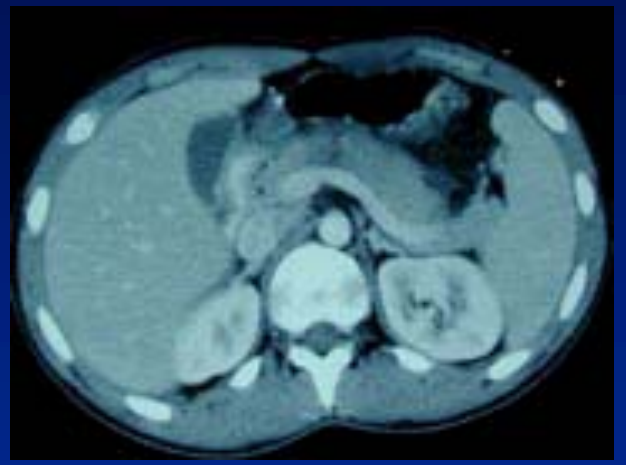


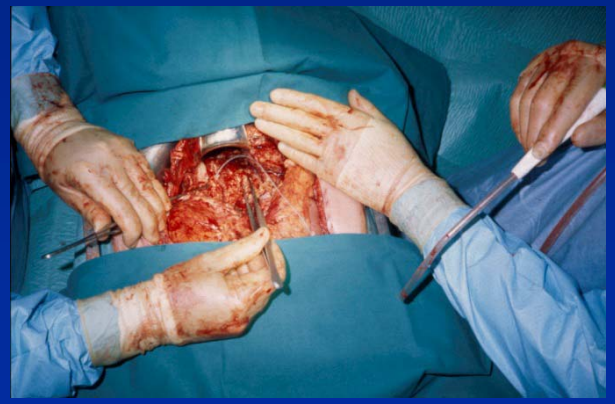
The treatment of pancreatic injuries is based on its severity classification by radiological evaluation and/or surgical exploration



Diagnosis and grading

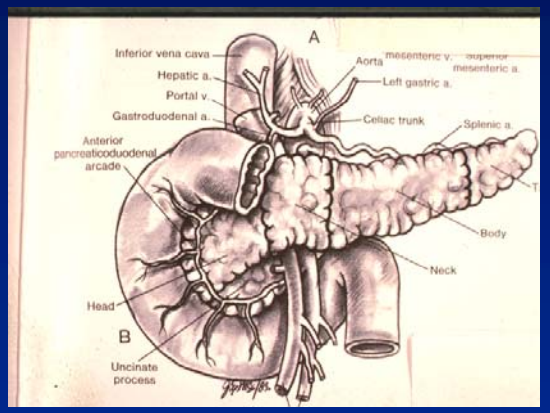
- preoperative evaluation
  - serial amylase measurement
  - CT (MRI)
  - ERCP
- during operative exploration for trauma
  - exposure
  - assessment of the severity of the pancreatic injury

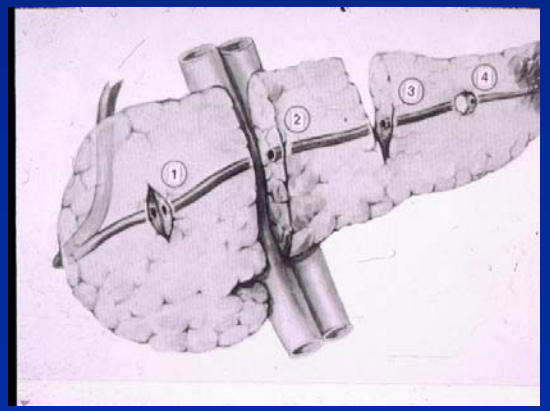




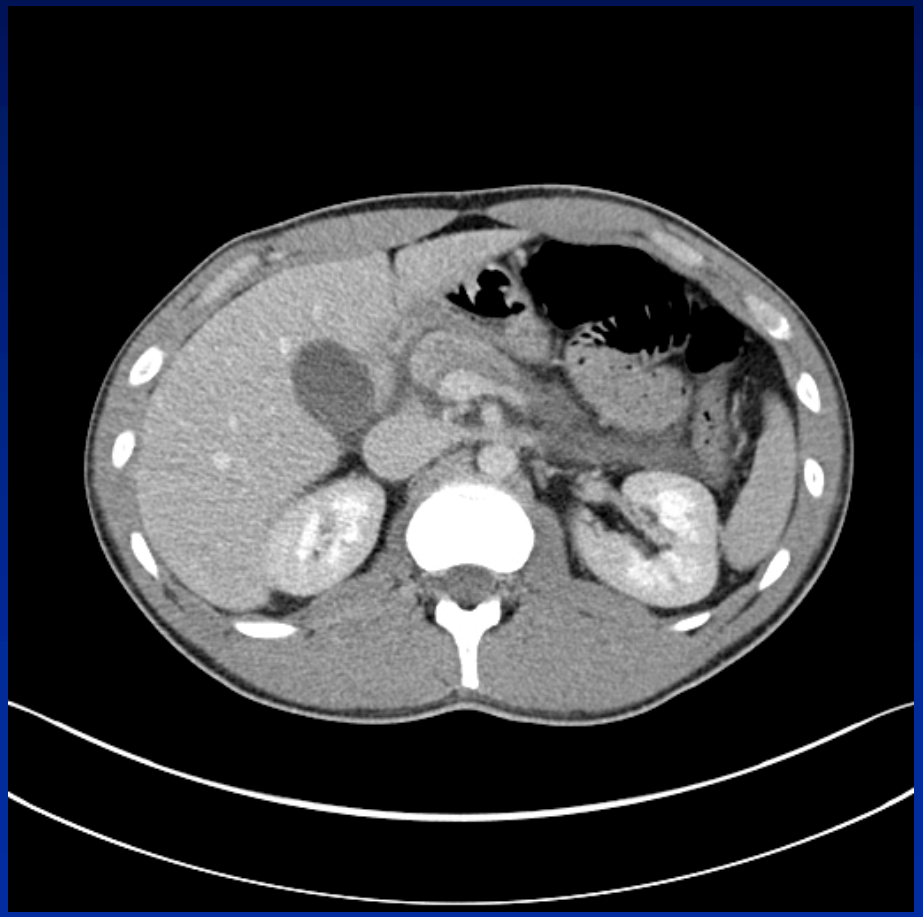
Pancreatic injury - severity classification (AAST 1990)

- **Grade I and II**: hematoma or laceration, main duct intact
- **Grade III**: distal transection or parenchymal injury with duct injury at or to the left of the SMV
- **Grade IV**: proximal transection or parenchymal injury not involving ampulla
- **Grade V**: massive disruption of the pancreatic head with ampullary injury

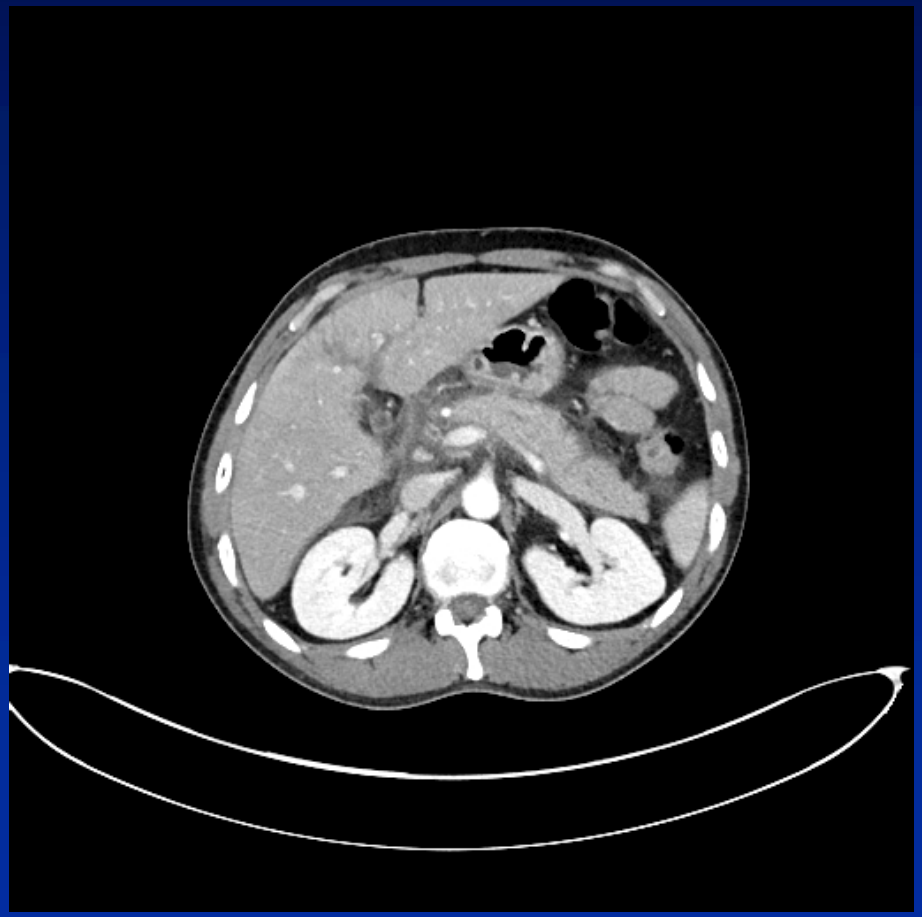




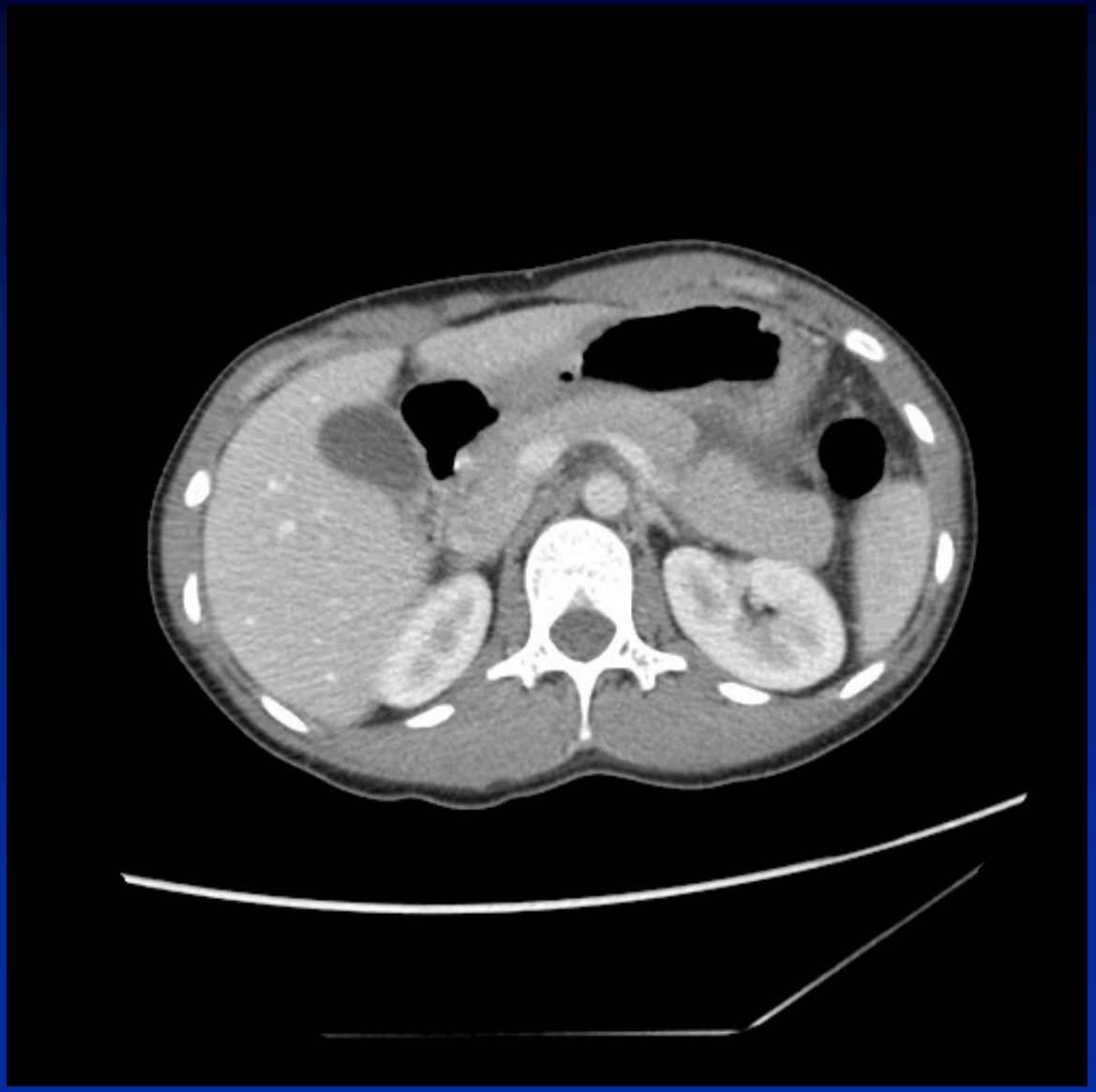
Grade I



Grade II



Grade III



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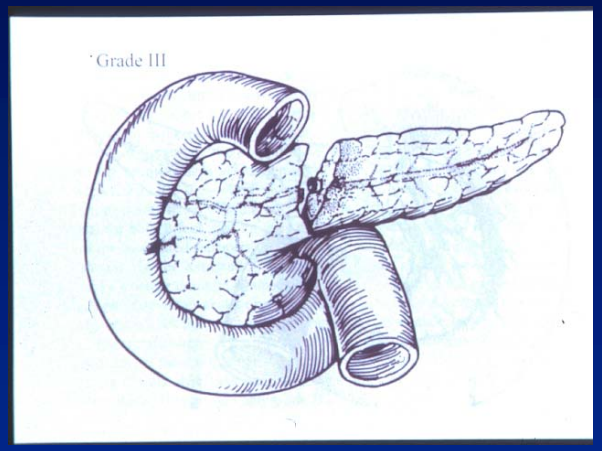
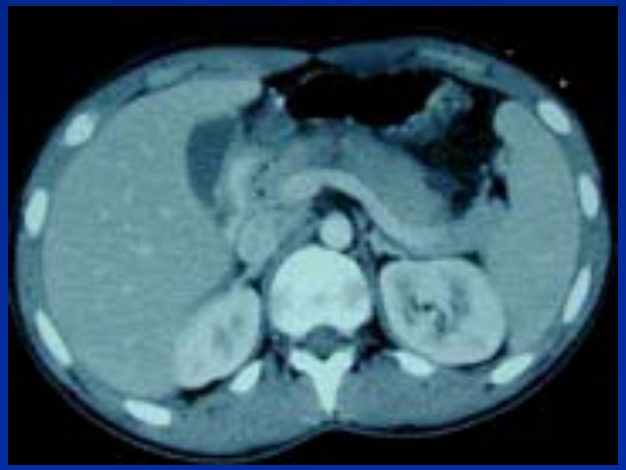
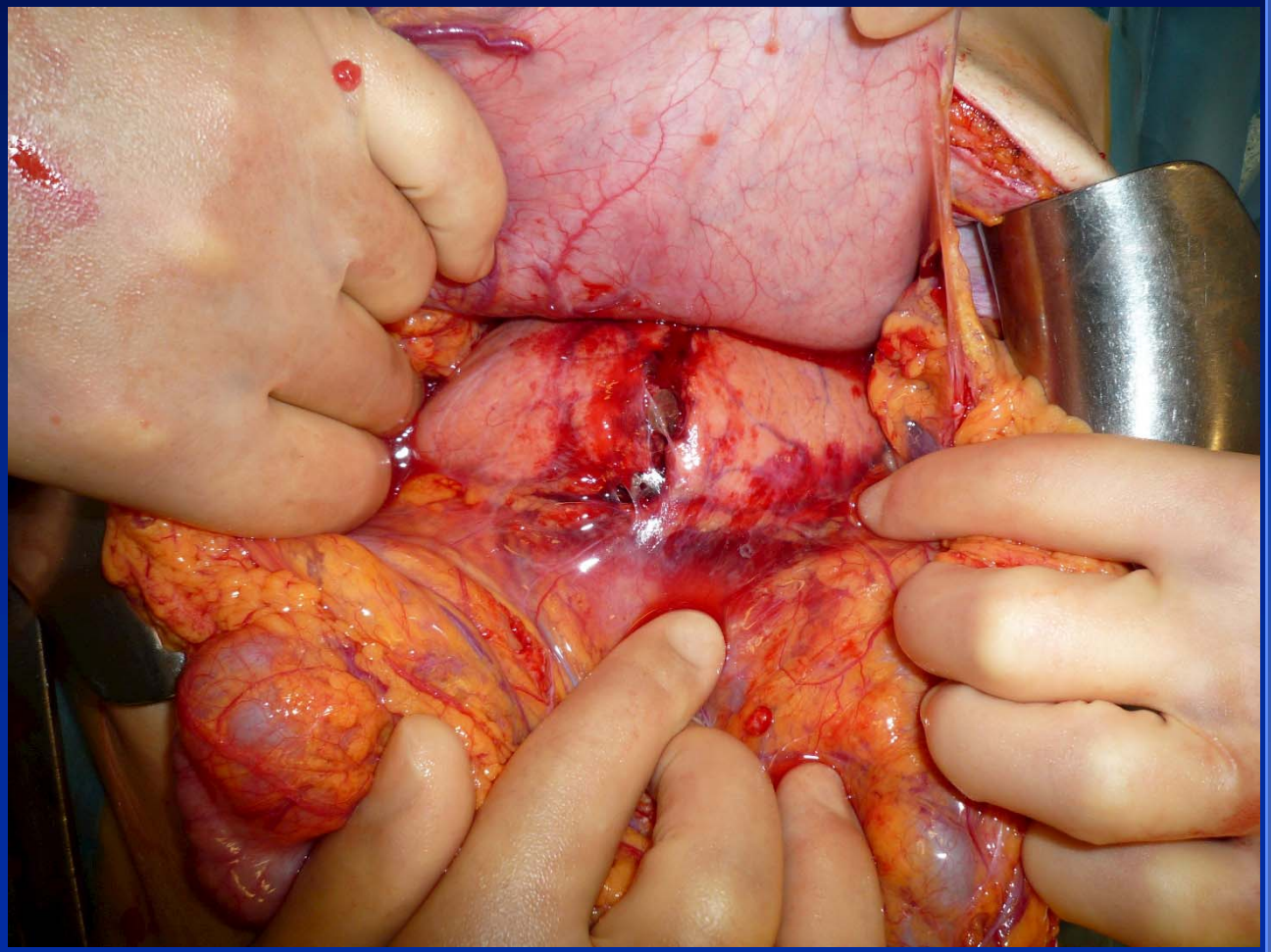
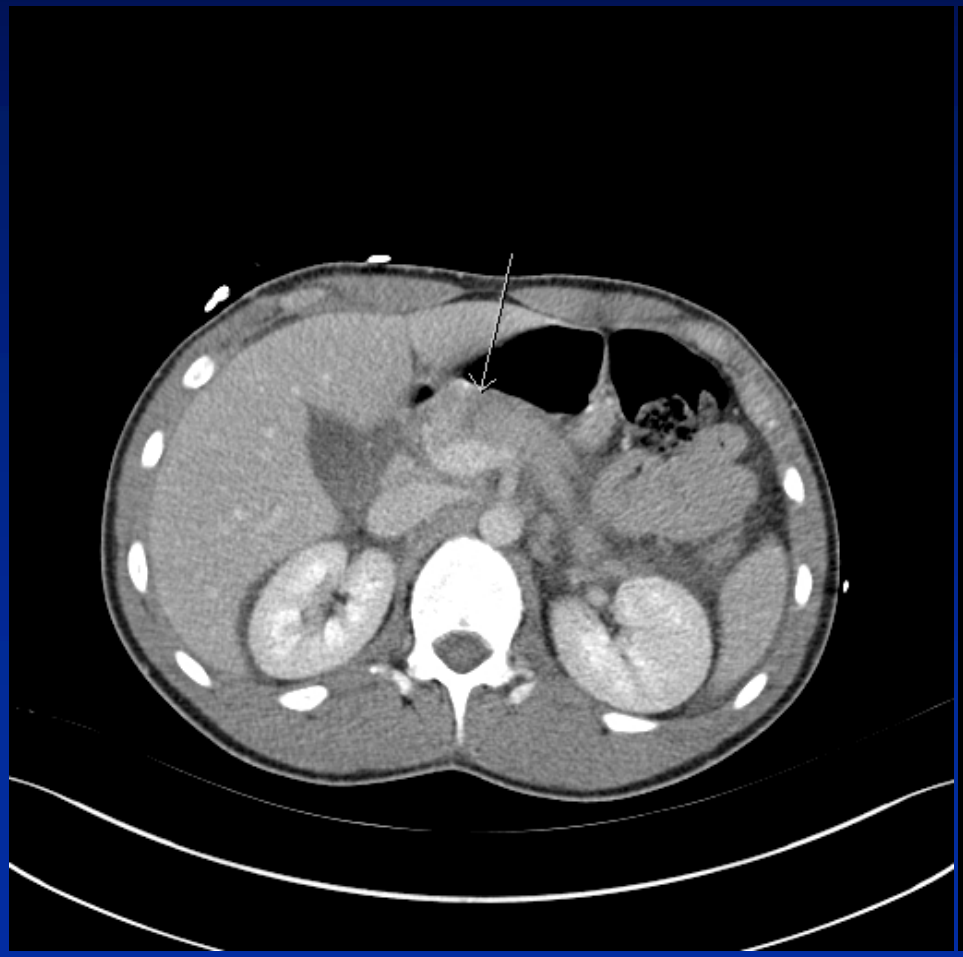
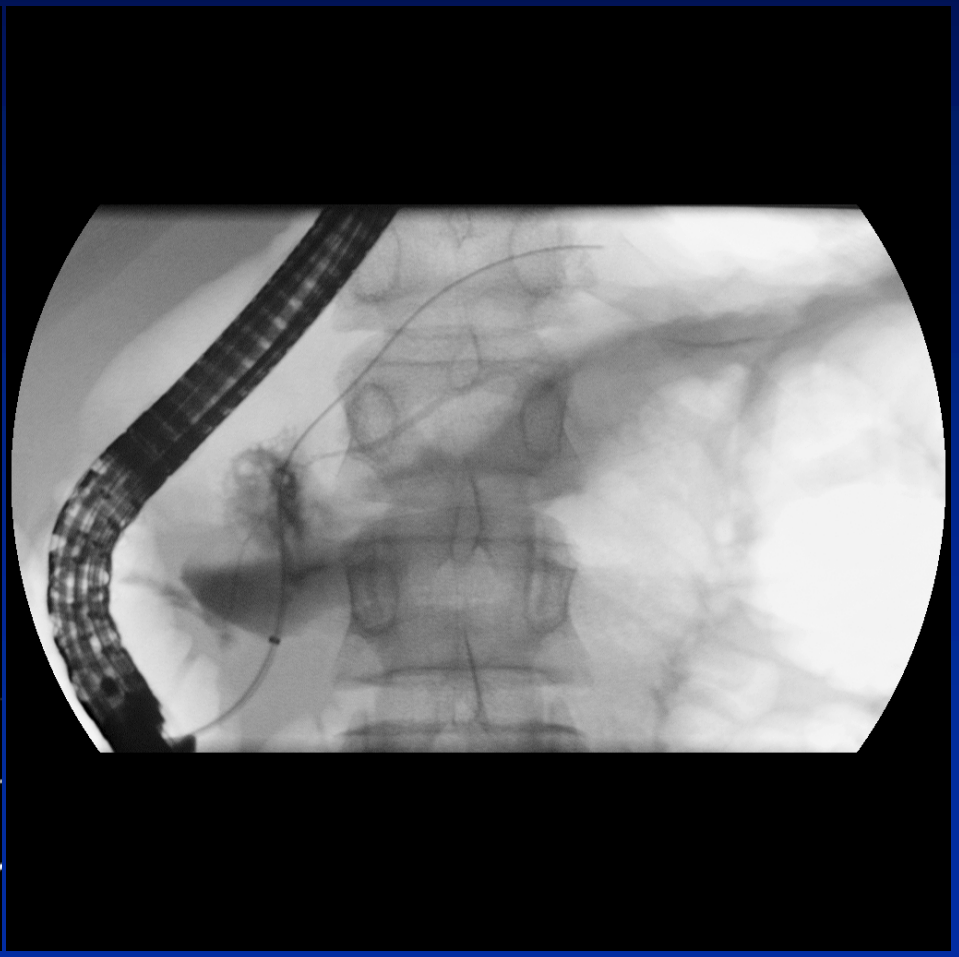




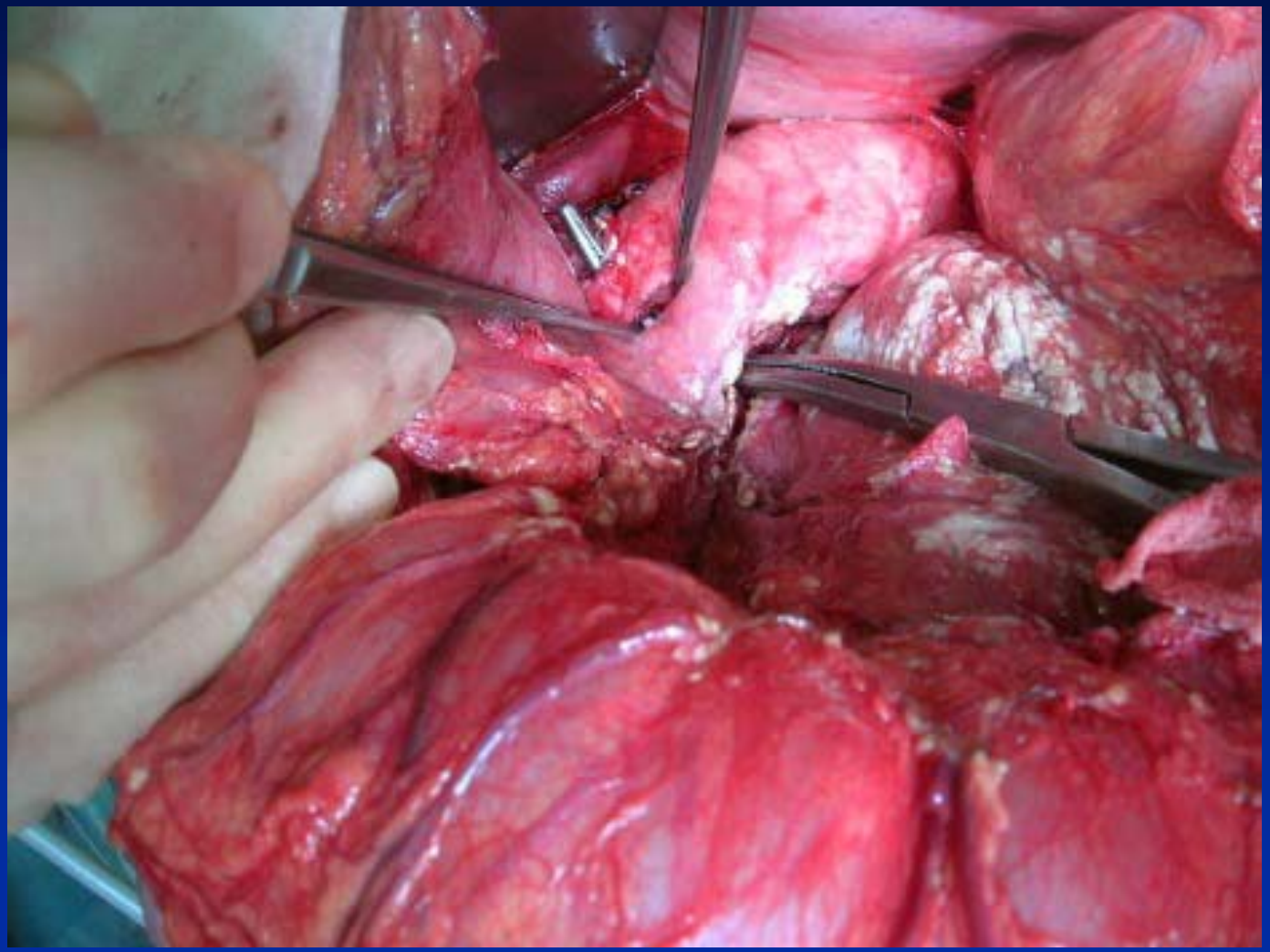


Grade IV

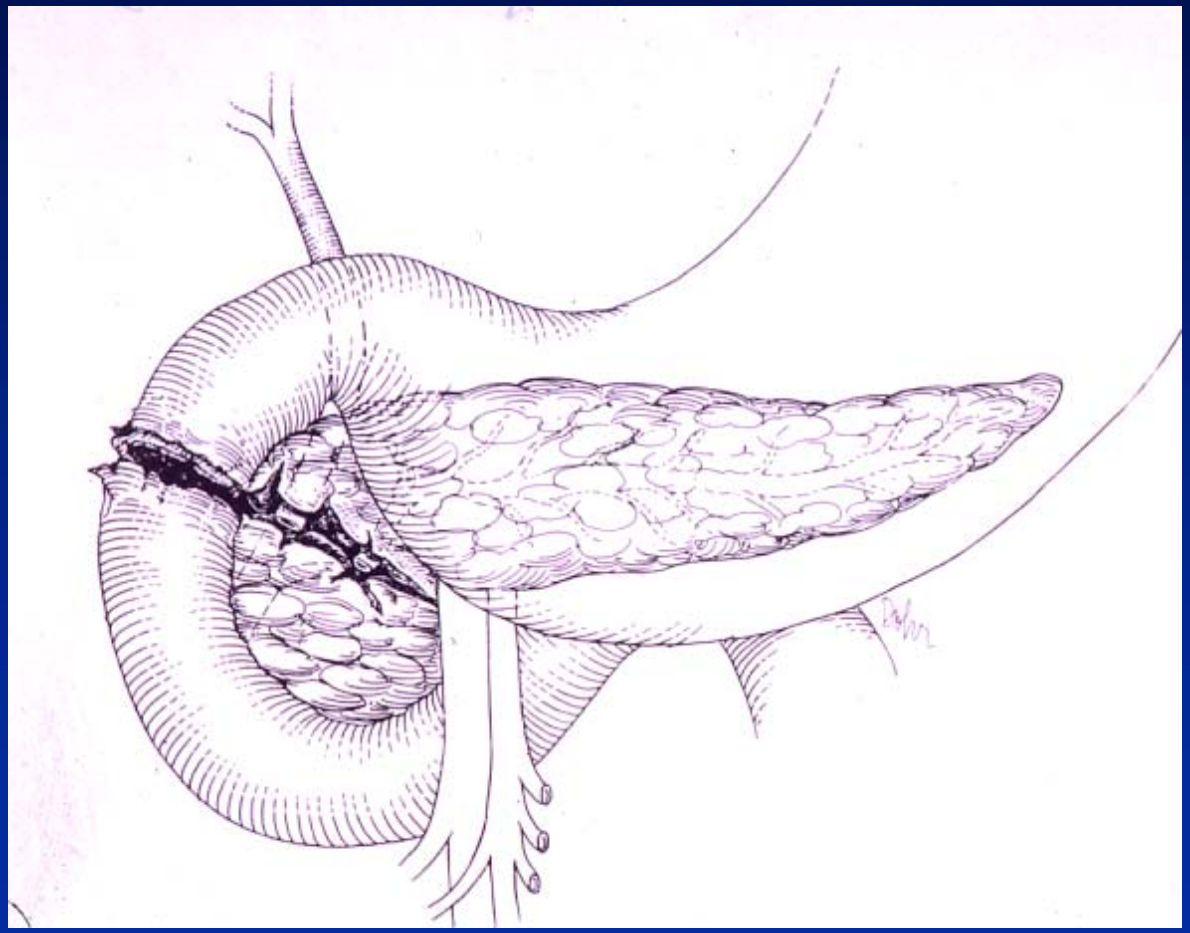




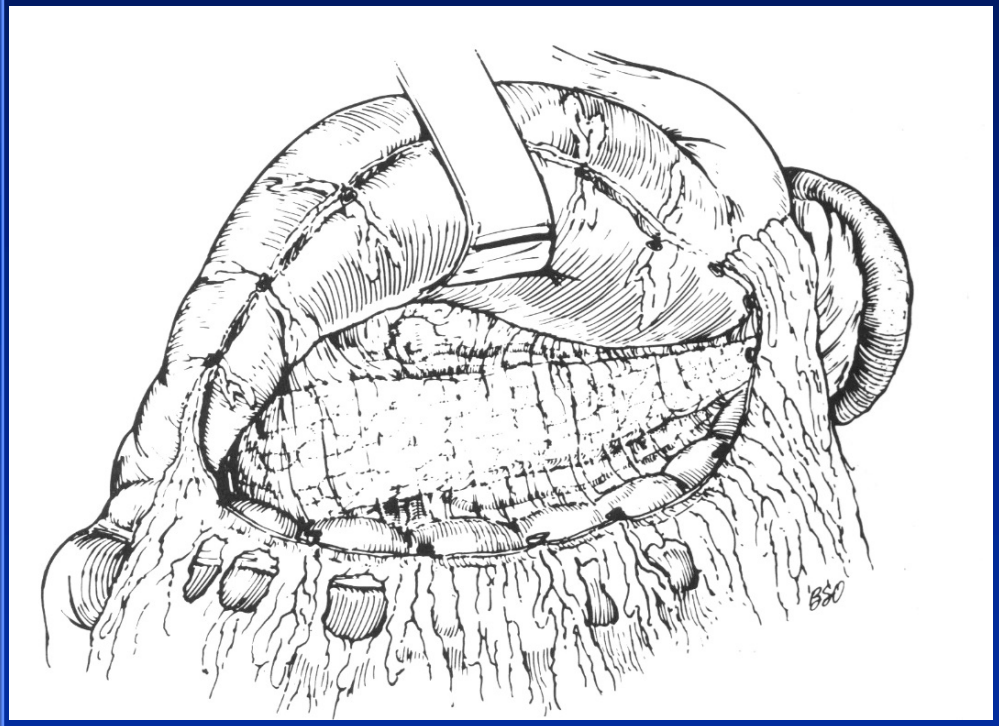
Grade IV

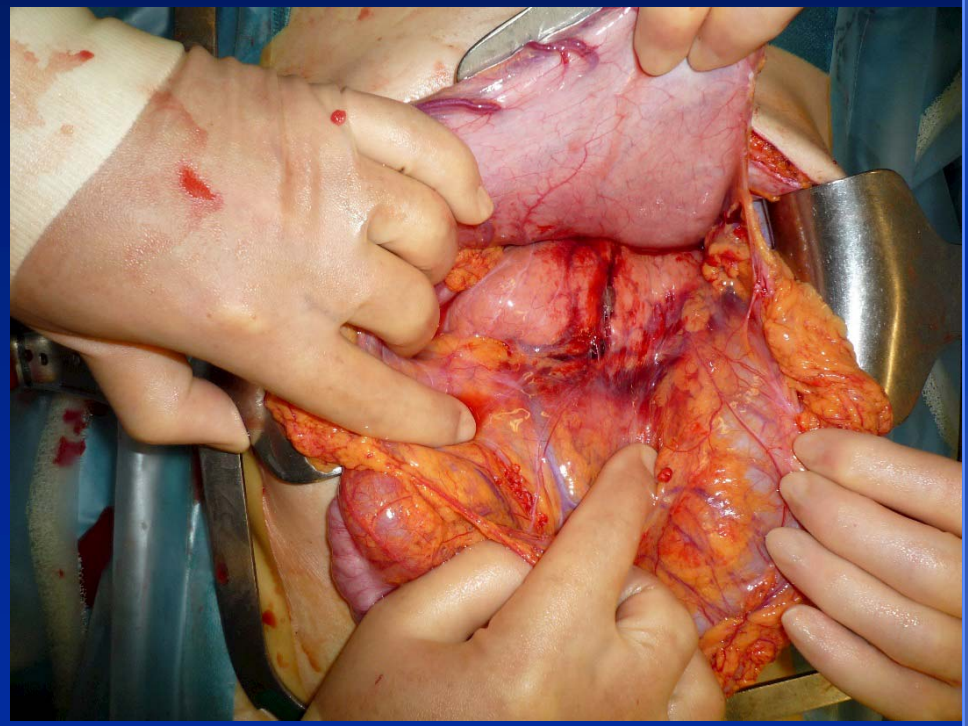


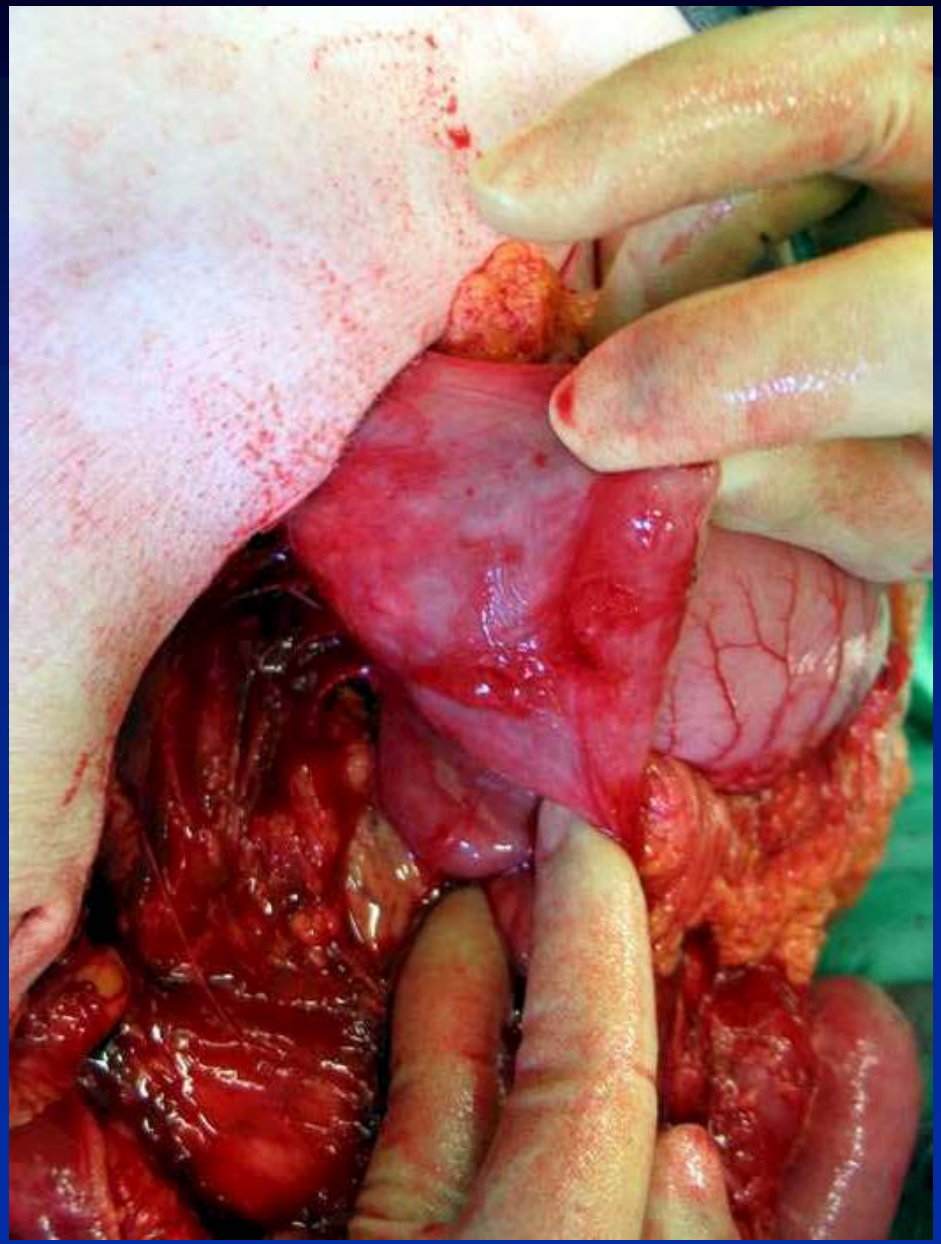
Grade V

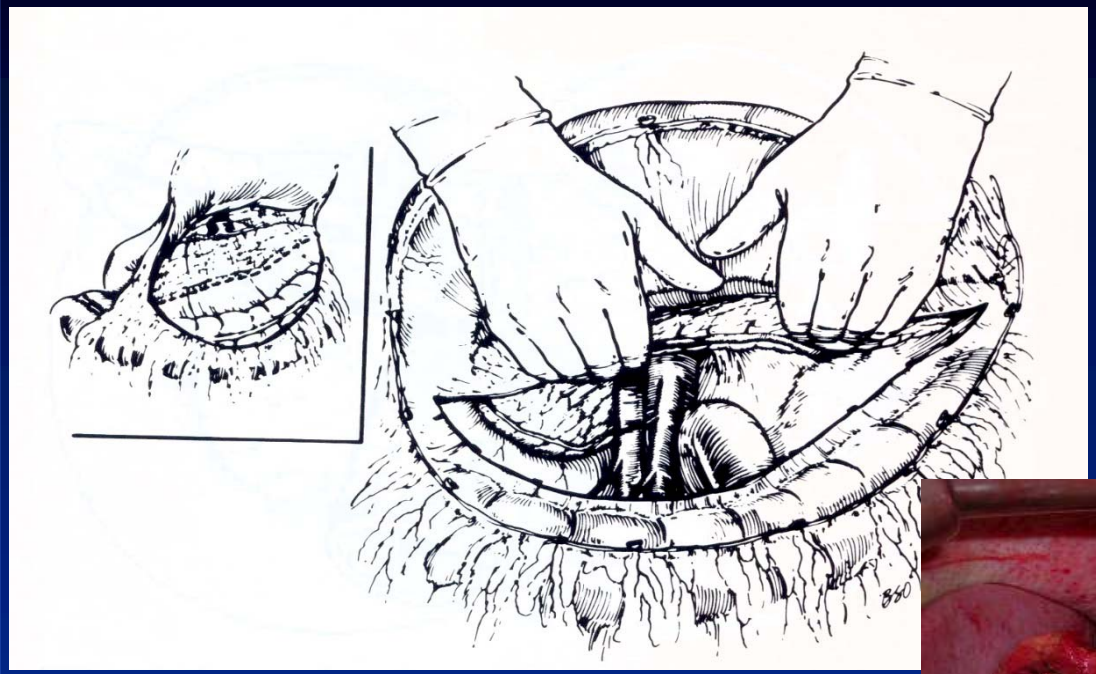


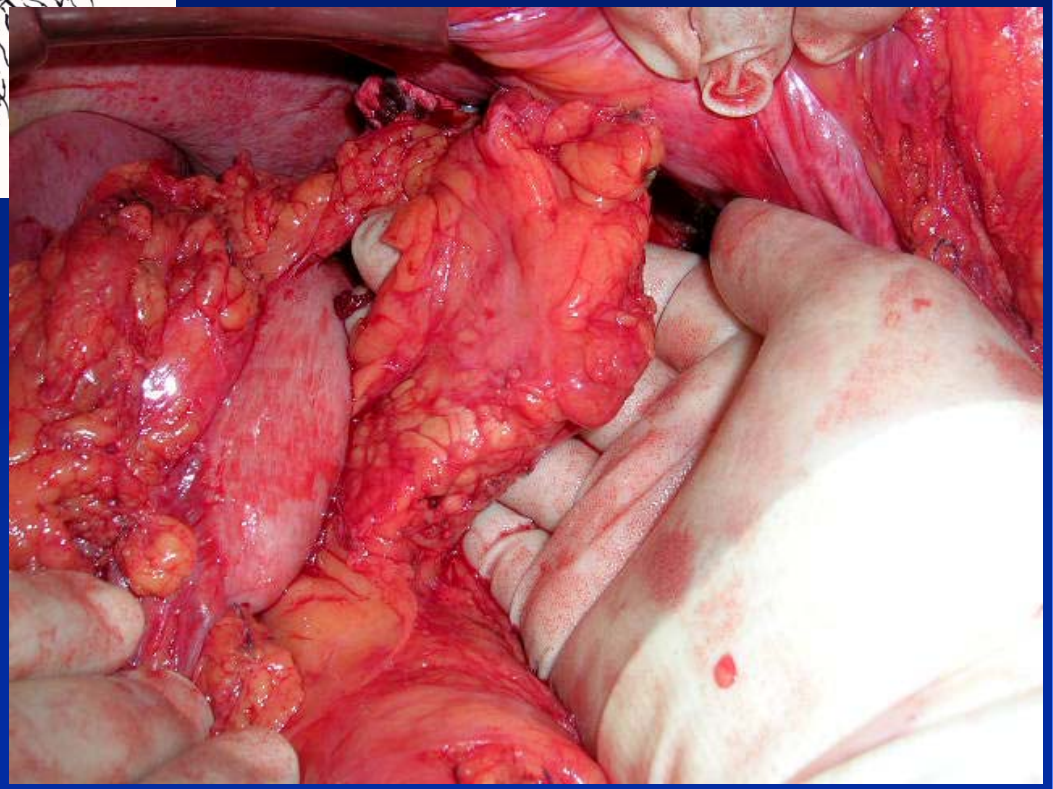
Operative exposure

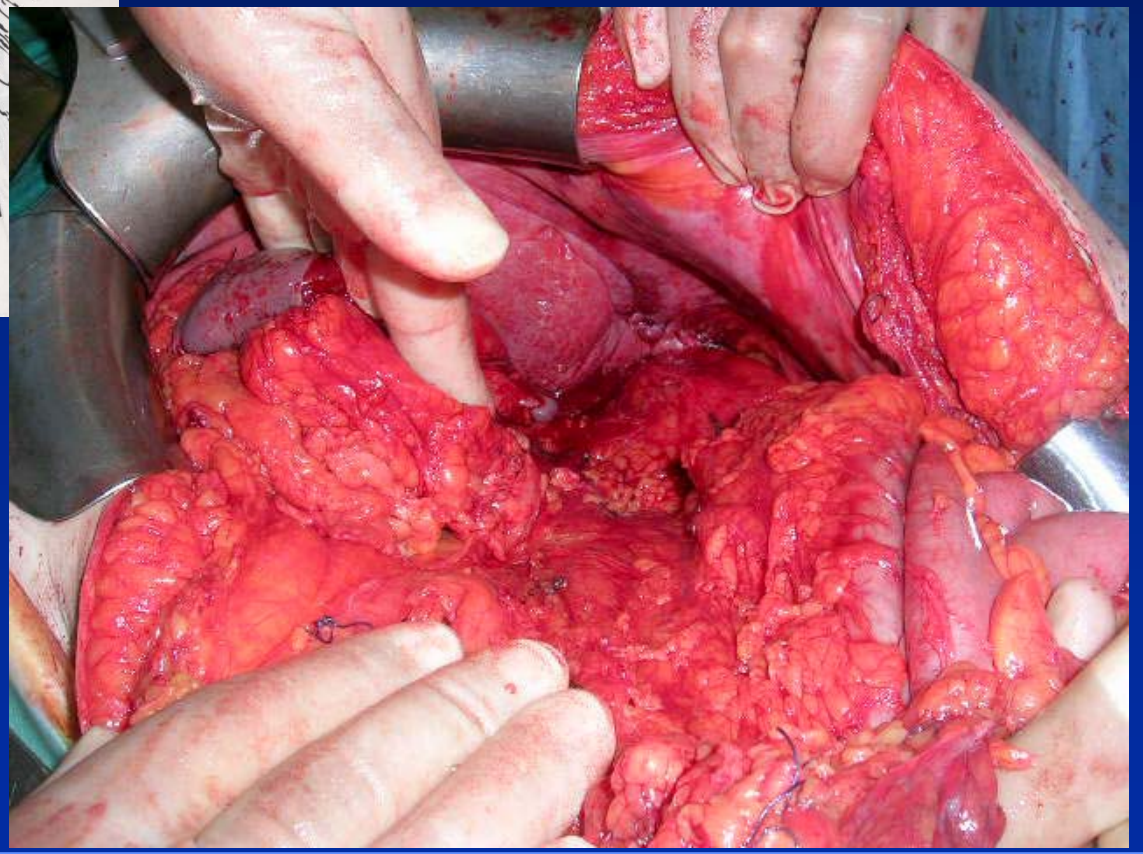










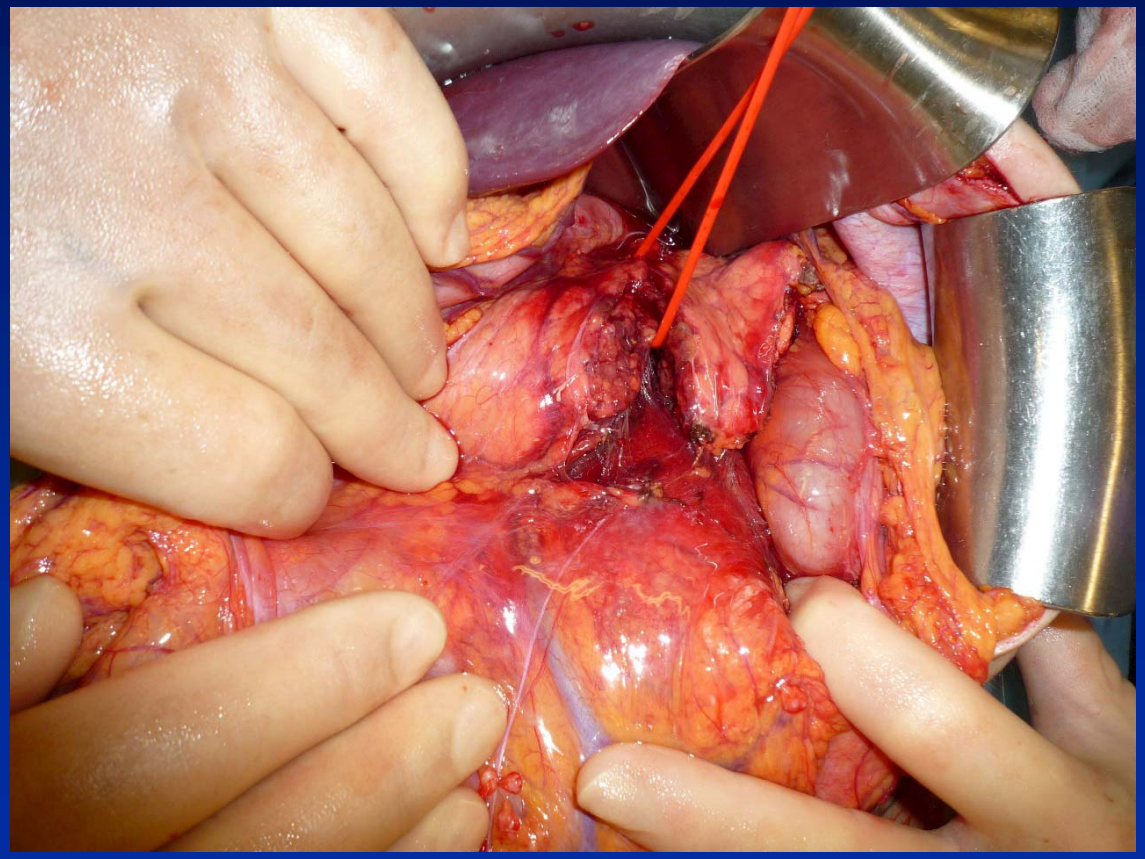


Assessment of the main pancreatic duct

- visual assessment of the pancreatic injury
- intraoperative pancreatography (or dye)
    - transduodenal or distal cannulation
    - distal cannulation
    - cholecysto- or choldocho-cholangiogram
    - intraoperative ERCP

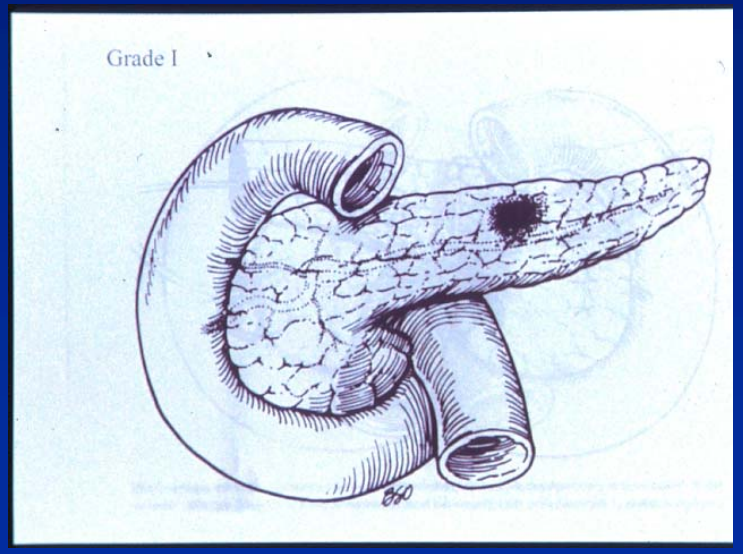
- severity grading (AAST)

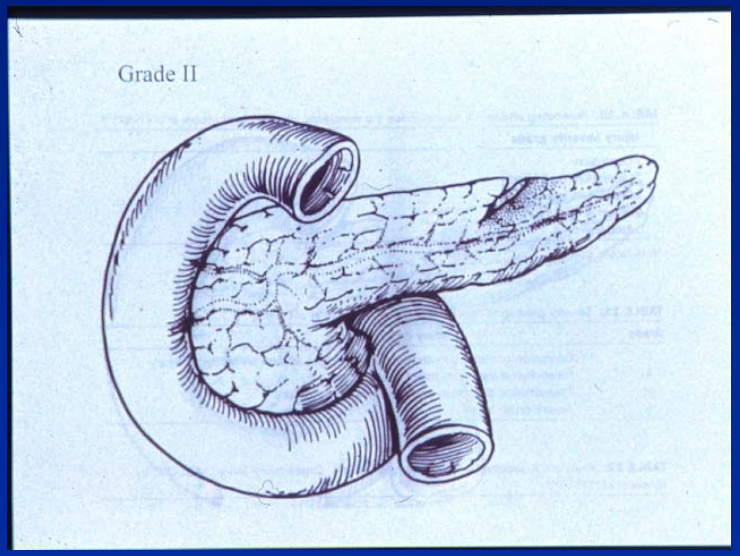
Surgical management



Surgical management of pancreatic injuries - options (Grade I-II)

- peripancreatic drainage ± hemostatic sutures





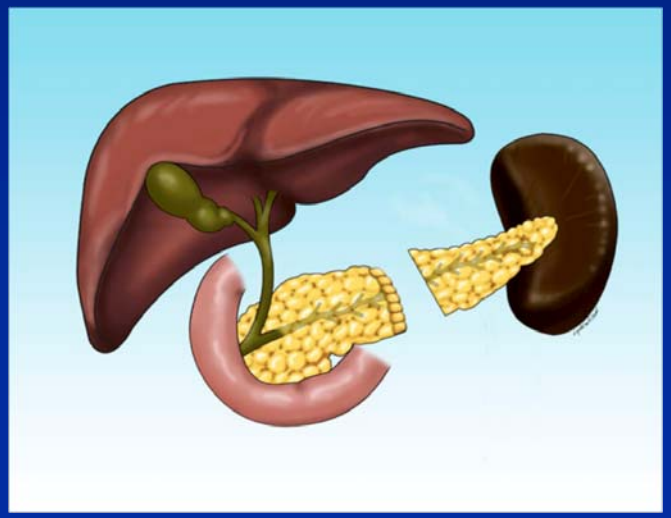
Selective nonoperative management (NOM) of low grade blunt pancreatic injury

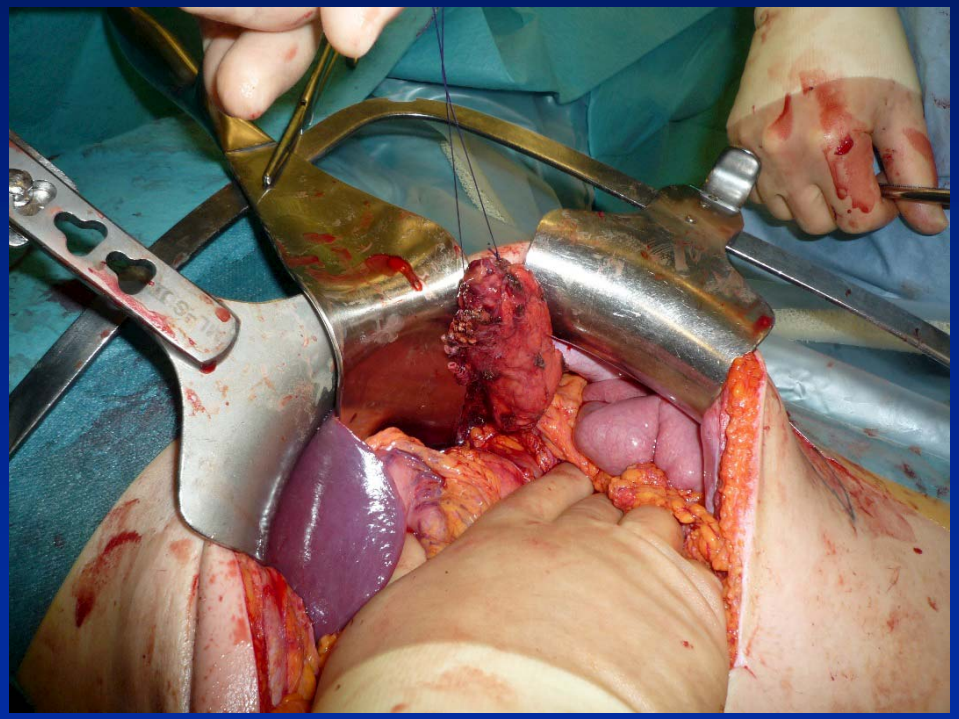
- grade I-II, diagnosis based on CT
- 35 patients selected for NOM
- failed in 5/35
  - bowel injury 2
  - pancreatic abscess 3
    - 1 developed fistula
  - no deaths among failed NOM

Duchesne et al. 2008

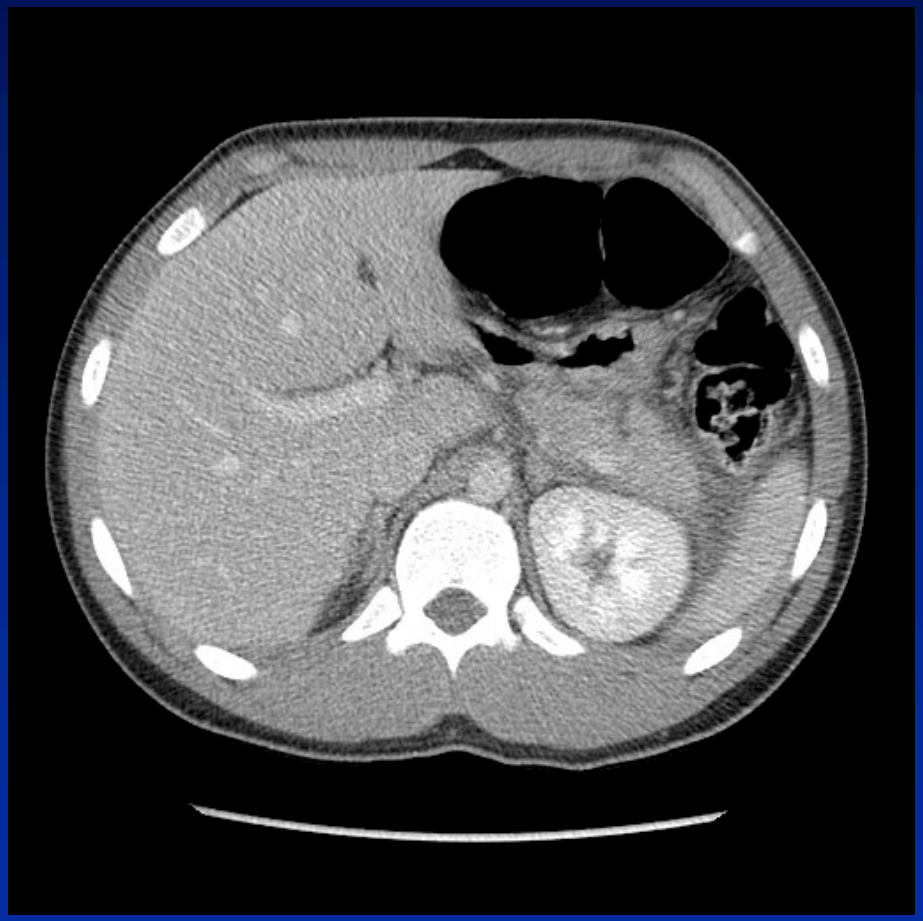
Surgical management of pancreatic injuries - options (Grade III)

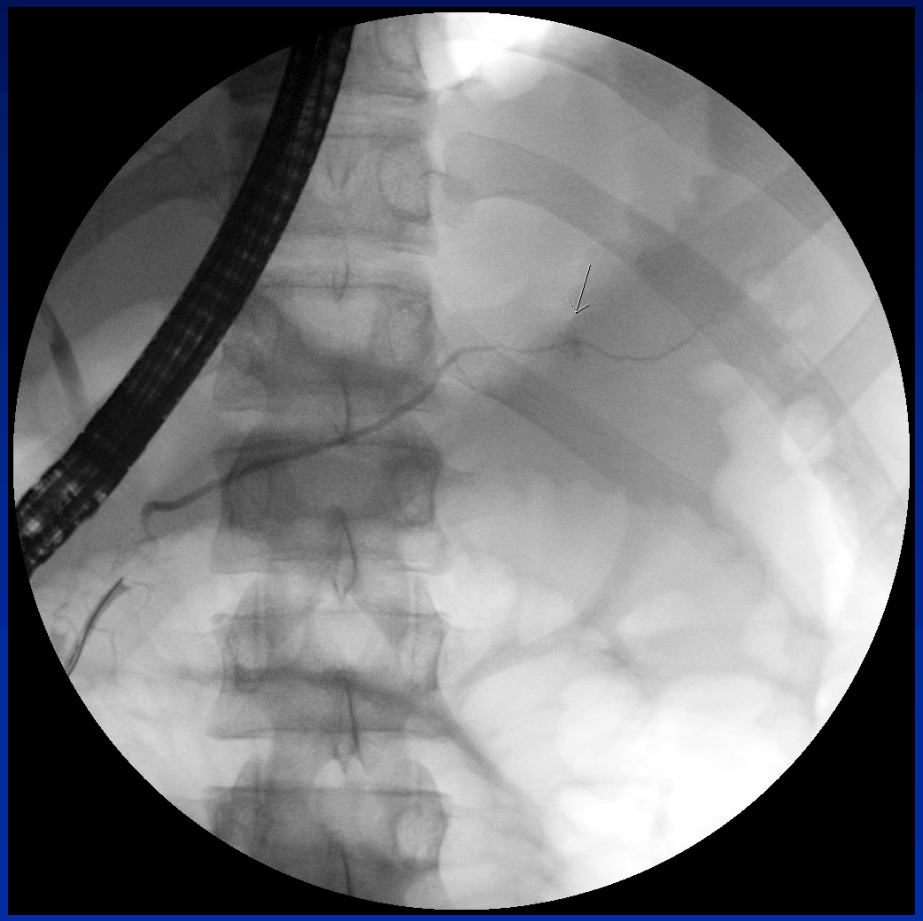
- peripancreatic drainage
  ± hemostatic sutures
- distal pancreatectomy
  (<80%) ± splenectomy





Grade III





Endoscopic management of blunt pancreatic trauma grade I-III (n=132 with NOM)

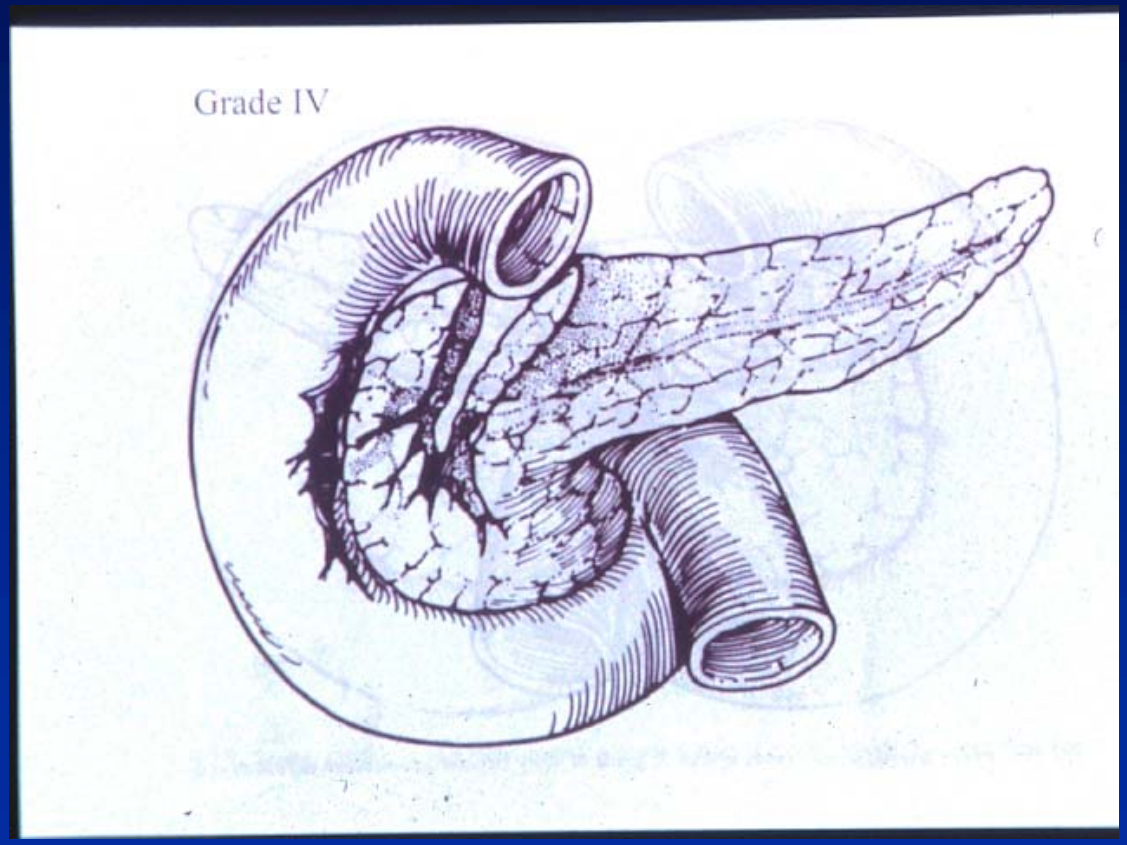
- 74 observed without ERCP, 58 had ERCP → failures rates

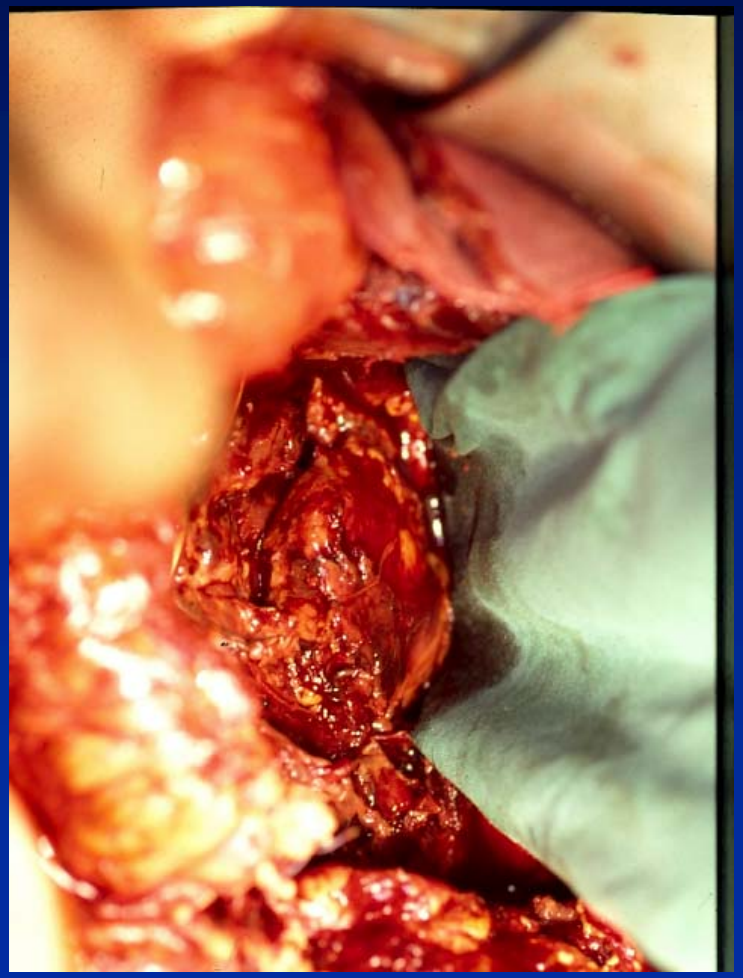
	NOM	NOM+ERCP	p
Grade I	3/35 (9%)	0/19	0.49
Grade II	13/31 (42%)	3/24 (13%)	0.037
Grade III	6/8 (75%)	5/58 (9%)	0.003

- if leak but contrast in main duct upstream → nasopancreatic drainage adjacent to disruption or cross if possible
- persistent duct disruption → pancreatic duct stent

Kong et al. Injury 2014;45:134

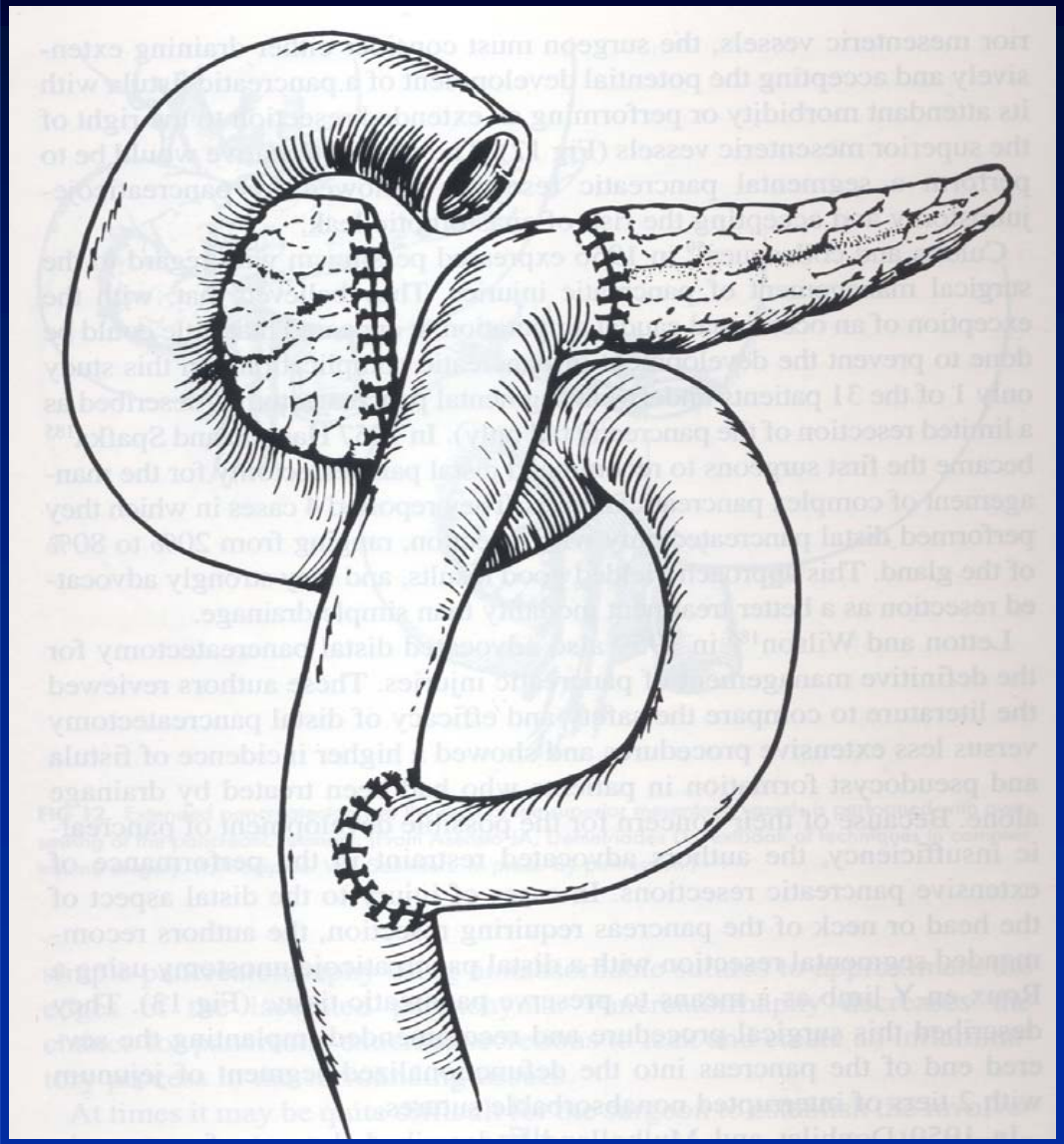
Grade IV pancreatic injury

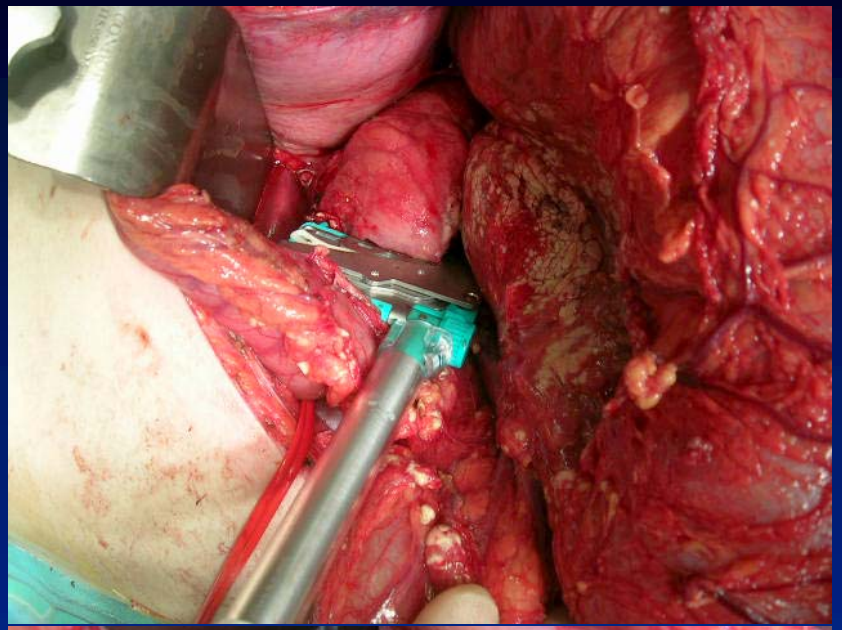


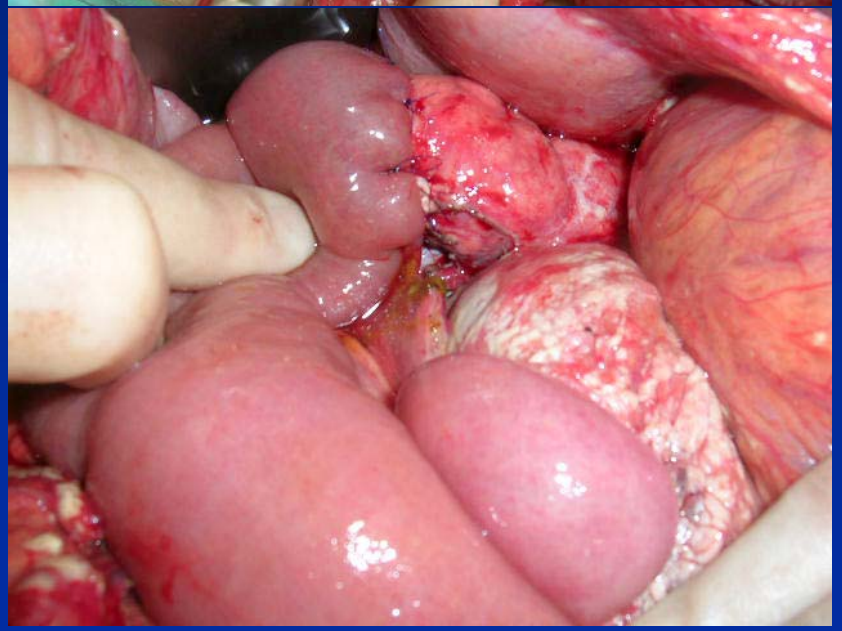


Surgical management of pancreatic injuries - options (Grade IV)

- peripancreatic drainage ± hemostatic sutures
- pancreaticojejunostomy (Roux-en-Y)
  - distal (with proximal stump closure)
- subtotal or near-to-total pancreatectomy
- primary repair of the pancreas and main pancreatic duct (15 reports) (Aucar et al. 2004)

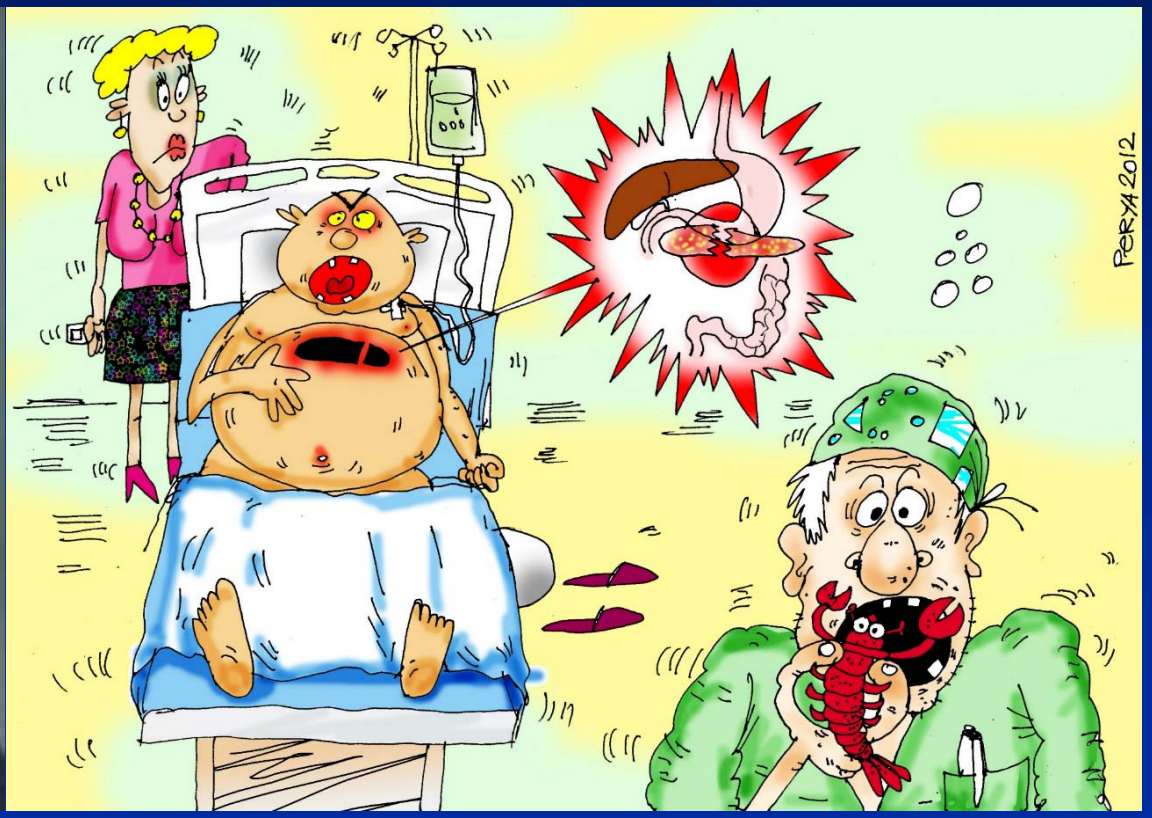




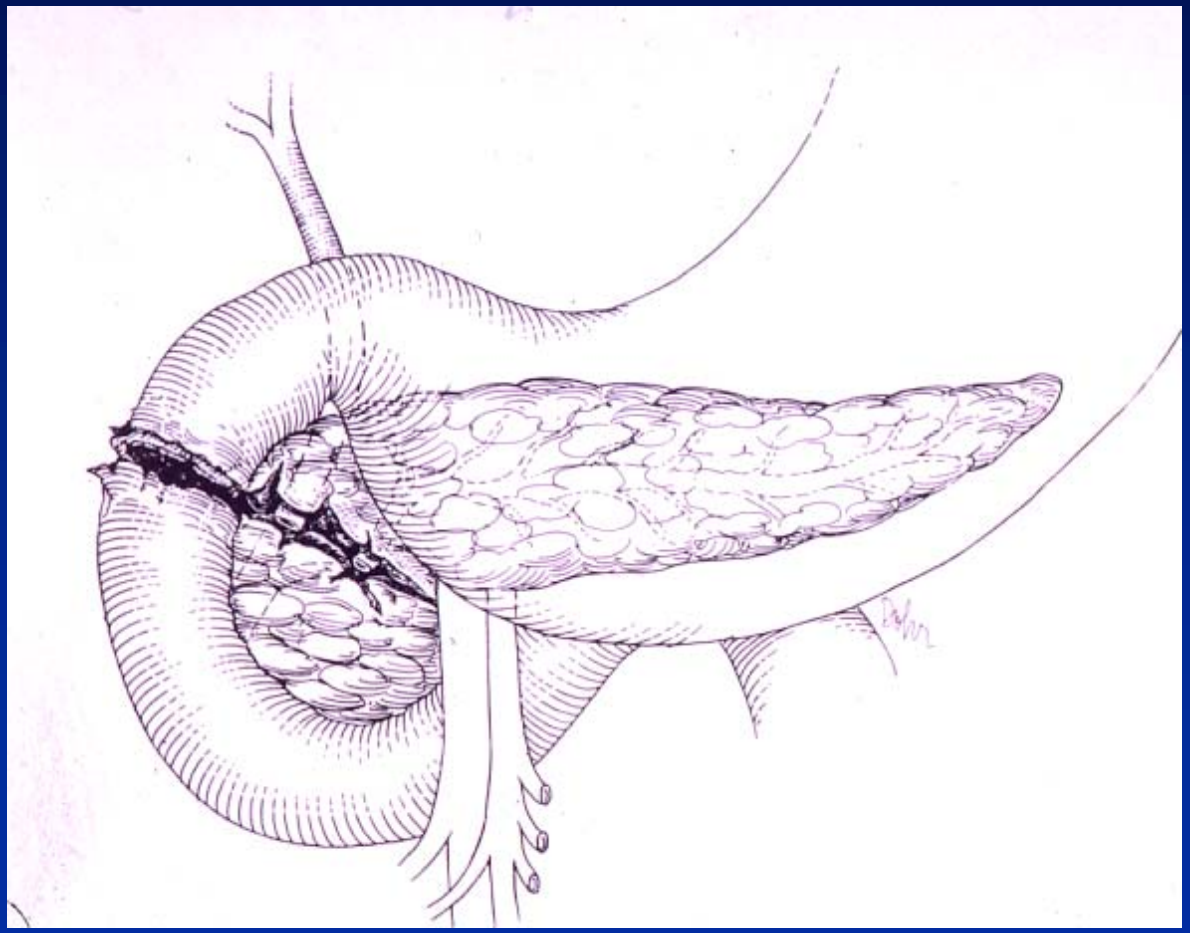


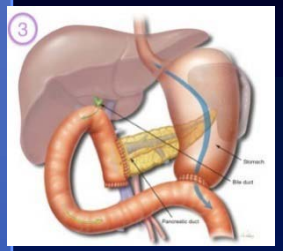
Fabian's rule in pancreatic trauma

Suck the head and eat the tail!

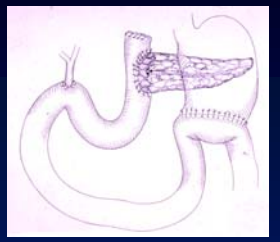


Grade V pancreatic injury





Whipple ?



- as a part of damage control surgery with delayed reconstruction (packing with drainage)

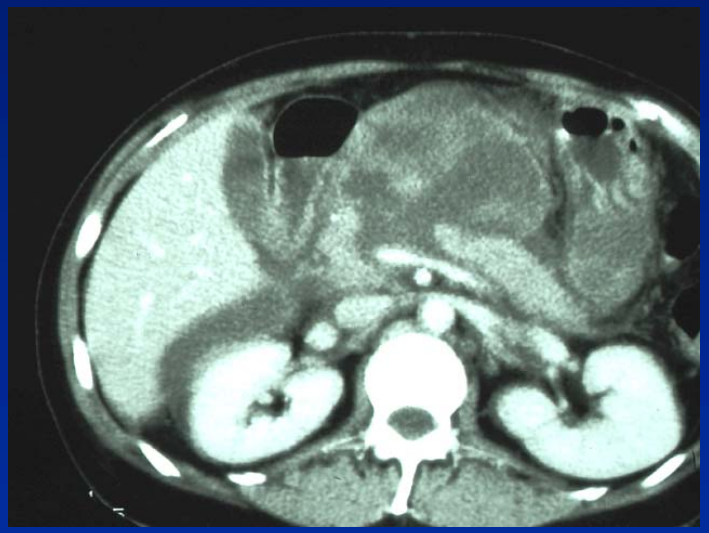
Seamon et al. 2008

- massive uncontrollable bleeding from the head of the pancreas, adjacent vascular structures, or both
- massive and unreconstructable ductal injury in the head of the pancreas
- combined unreconstructable injuries of:
  - duodenum and head of pancreas
  - duodenum, head of pancreas and CBD

Asensio et al. 1999

Pancreatic trauma - outcome
(n=4134/3613/3898, collective series)

- mortality	19%	
- Whipple		31%
- morbidity	37%	
- fistula		14%
- abscess		8%
- pancreatitis		4%
- pseudocyst		3%
- hemorrhage		1%



Asensio et al. 1999