Pancreatitis

CNS/NP Teaching
June 9th 2020

Objectives

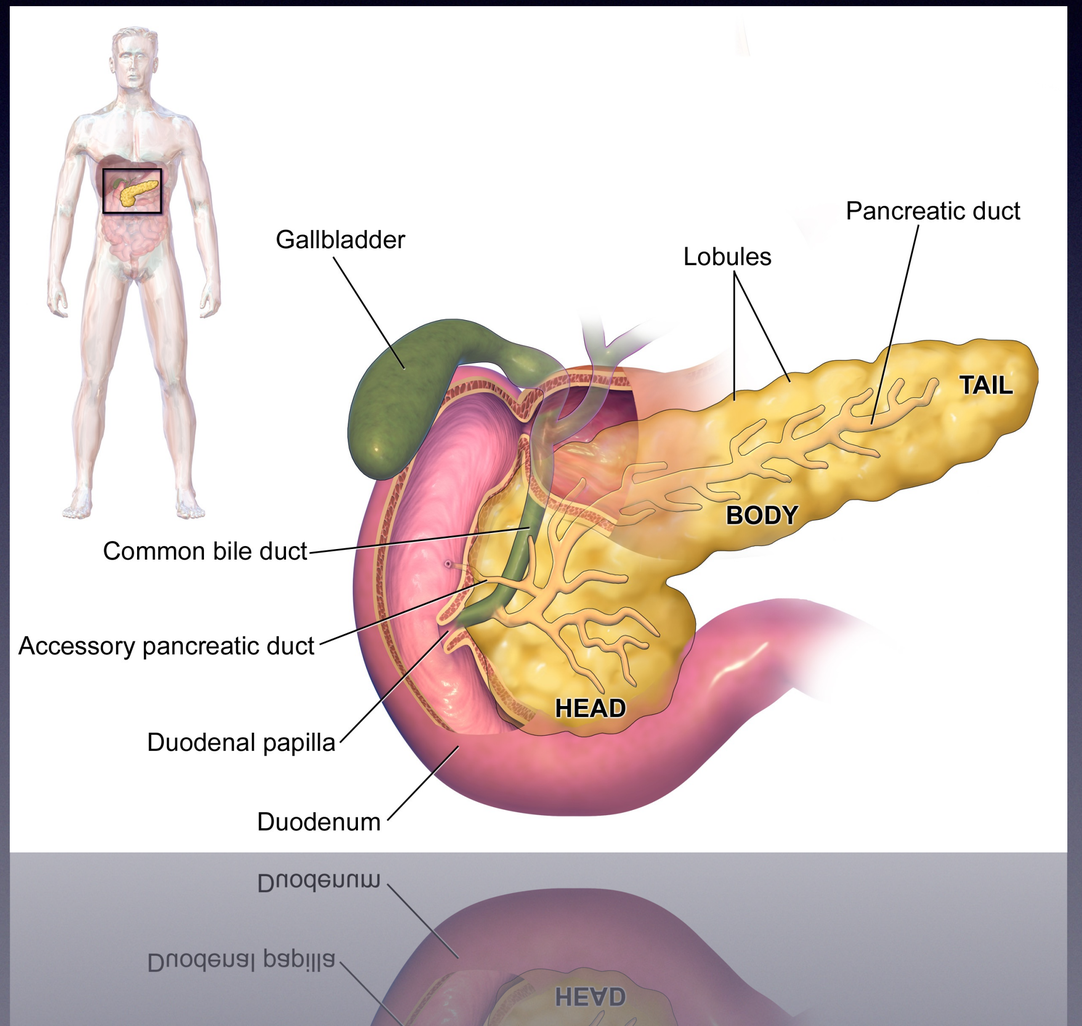
- Anatomy and function of the pancreas
- Pathophysiology
- Causes
- Presentation
- History and exam
- Differentials
- Investigations
- ED management
- Scoring systems
- Complications
- Chronic pancreatitis

Anatomy

Retroperitoneal organ at level of L2

Relations:

- Stomach, left kidney, duodenum, spleen
- Omentum, peritoneum and bowel
- Aorta, IVC, portal vein, renal veins, splenic veins, superior mesenteric vessels
- Gallbladder, bile duct
- L2 vertebra



Functions

- Mainly exocrine
  - Aids digestion and acid neutralisation
  - Digestive enzymes, pancreatic juice, bicarbonate
  - Acinar cells around small ducts
- Endocrine
  - Mostly to regulate blood sugar
  - Insulin, glucagon, somatostatin, pancreatic polypeptide
  - Clusters of cells (Islets of Langerhans)

Pathophysiology

- Multi-system disease due to inflammation of the pancreas
- Activation and release of pancreatic enzymes
- Cellular breakdown and pancreatic tissue auto-digestion
- Oedema and obstruction of ampulla of Vater —> bile reflux
- Local inflammation —> generalised —> necrosis
- SIRS —> shock —> multi-organ failure

Causes

- *I GET SMASHHHED*
- (Idiopathic, genetic)
- Gallstones
- Ethanol
- Trauma
- Steroids
- Mumps etc… EBV, CMV, HIV, Hep, TB, salmonella
- Autoimmune (SLE, pregnancy, vasculitis, DKA, CF)
- Scorpion bites (Trinidad)!
- Hypercalcaemia, hyperlipidaemia, hypothermia, hypotension (ischaemia)
- ERCP, emboli
- Drugs (NSAIDs, diuretics, OCP, valproate, erythromycin…)

Causes

- Gallstones
  - Approx. 45% of cases
  - Most common cause in women
  - Higher risk with smaller stones - obstruct pancreatic duct
- Alcohol
  - Approx. 35% of cases
  - Most common in men
  - Usually after 5-10 years of heavy use
  - Most common cause of chronic pancreatitis

History

- Epigastric pain - can be RUQ/LUQ or generalised
  - Rapid - usually <24 hours
  - Constant
  - Relieved by sitting forwards
  - Radiates to back
- Fever
- Nausea and vomiting

- PMHx
- Medication Hx & allergies
- Social Hx - alcohol and drug use

Examination

- Tender epigastrium
- Usually no true guarding or rigidity (may have voluntary guarding)
- Distension and absent bowel sounds due to ileus
- Temp 38-39 common
- SIRS/shock - tachycardia, hypotension, tachypnoea, AMS
- Cullen’s & Grey Turner’s signs - very rare

Differentials

- Gastritis, GORD
- Cholecystitis
- Perforated ulcer
- Cholangitis
- Acute hepatitis
- Bowel obstruction
- Acute MI
- Aortic dissection
- Ruptured AAA
- Pneumonia
- Renal colic

Investigations

- Lipase - diagnostic
- *CRP* - marker of severity (important at WDHB)
- FBC - WCC marker of SIRS and severity
- VBG - acidosis, lactate, glucose
- Glucose - sepsis, DKA, hypoglycaemia
- U&E incl calcium - renal function, electrolyte disturbance
- LFTs - hepatocellular dysfunction (hepatitis cause) or obstruction

Investigations

- LDH (lactate dehydrogenase) - marker of severity
- Coag screen - DIC, liver synthetic function
- Lipids and triglycerides - if no other obvious cause
- CXR - effusion, atelectasis, ARDS, perf, pneumonia
- AXR - rarely helpful, appeases surgeons, possibly obstruction
- USS - GB, stones, CBD, oedema
- CT usually delayed for a week, USS is better initial investigation

Investigations

- Lipase (7-60iu/L normal)
  - Levels rise 4-8h of onset, peak at 24h, normalise in 1-2 weeks
  - 95% sensitive and specific, 100% if levels >3x normal
  - More sensitive than amylase in chronic pancreatitis
  - Degree of elevation correlates poorly with severity of disease

ED Management

- Supportive : >80% resolve spontaneously within a week
- Analgesia
- IV fluids - particularly first 12-24 hours
- NBM initially
- NGT if vomiting or ileus
- Calcium if hypocalcaemic
- Antibiotics only for proven infection or cholangitis - give if unwell
- IDC - if shock, oliguria

Severity Scoring

- Glasgow, Ranson, APACHE II, BISAP, Balthazar
- Generally not helpful for emergency physicians
- Variable sensitivity/specificity but don’t change management
- Some are calculated at 48 hours, not at presentation
- Glasgow is used at WDHB

Glasgow Score

- Valid for both gallstone and alcohol induced pancreatitis
- ≥3 indicates severe pancreatitis
  - P - PaO_2 <8kPa
  - A - Age >55
  - N - Neutrophilia: WCC >15
  - C - Calcium <2 mmol/L
  - R - Renal function: Urea >16 mmol/L
  - E - Enzymes: LDH >600iu/L; AST >200iu/L
  - A - Albumin <32 g/L
  - S - Sugar: Glucose >10 mmol/L

Complications

- Intravascular volume loss - oedema, vomiting, ileus, effusion, ARDS
- Infection - 10%, accounts for most deaths
- ARDS
- Pseudocysts, usually >4 weeks after onset
- Hypocalcaemia, hyperglycaemia and diabetes, venous thrombosis
- Chronic pancreatitis in 10%

Chronic Pancreatitis

- Alcohol, a few other causes - if no cause, it’s alcohol!
  - Smoking is a high risk factor
- Normal pancreas replaced with fibrotic tissue and calcification
- Recurrent bouts of pain, N&V, weight loss
- Affects exocrine and endocrine functions of the pancreas
  - Malabsorption due to decreased digestive enzymes
  - T1DM due to decreased insulin production
- Pseudocysts, fistula, ascites, fixed obstruction

Management

- Can be tricky
- Lipase - moderately elevated, maybe persistently
- Check no other pathology/differentials
- CT and USS - identifies physical changes and complications
- Pain relief, fluids, alcohol withdrawal tx, nicotine replacement

Any questions?

References

- The Emergency Medicine Manual, Dunn
- Emergency Medicine: Concepts and Clinical Practice, Rosen, 8th Ed. Elsevier