MINIMALLY INVASIVE ABDOMINAL AND PELVIC SURGERY

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LEARNING OBJECTIVES

- Physiological impact of minimally invasive surgery
- Effects of pneumoperitoneum
- Problems with position and patient access
- Analgesia and IV fluids
LAPAROSCOPIC SURGERY

- Described more than 100 years ago
- Technological advances since 1980
  - High quality 3D images
  - Robotic assisted surgery – first in 1990
  - Looking into potential haptic feedback
- Shortened recovery
- Reduced complications
PNEUMOPERITONEUM

- CO2 used
  - Inert
  - Not support combustion
  - Highly soluble

- Issues:
  - Intra-abdominal pressure
  - Patient position
  - Effects of CO2 absorption
INTRA-ABDOMINAL PRESSURE

Effects of increased IAB is biphasic

- Vena cava compression
  - Reduced preload
- Increased SVR
- Reduced CO
  - May lead to LVF if pre-existing cardiac problems
- Reduced organ perfusion
- Venous pooling
  - DVT
  - Increased ICP
- Splint diaphragm – V/Q mismatch
CONTRAINDICATIONS TO MIS

- Severe RVF or biventricular failure
- Right to left cardiac shunt
- Hypovolemic shock
- Retinal detachment
- Raised ICP
ANAESTHETIC MANAGEMENT

- ETT
  - ?Supraglottic – ProSeal
- Avoid gastric distension
  - Care with BVM
  - Orogastric tube
- Ventilation
  - Permissive hypercapnia
  - Avoid N2O
- IV Fluids
  - Correct pre existing fluid deficit
  - Aim near zero balance
  - Treat hypotension with vasopressors
  - Give fluids at end of surgery if needed
  - Urinary catheter
    - Permissive oliguria
  - Can drink early post-op
- Monitor K
  - For urology surgery – if ureters clamped
MONITORING/ LINES

- IABP
- ?CVP
- ?BIS
  - Avoid excessive deep anaesthesia
  - Avoid postop cognitive dysfunction
- Secure your lines!
POSITIONING

- Trendelenburg – extreme!
  - Cerebral oedema
  - Raised ICP/IOP
- Reverse Trendelenburg
- Robotic – position is locked

Problems:
- Patient sliding
- ETT moving
- Gastric content spillage
- Nerve injury
ANALGESIA

- Multimodal
- Remifentanil
- Epidural
  - Problems with reduced mobility, more IV fluids
- Spinal + Intrathecal morphine/ diamorphine
- Others
  - Lignocaine
  - Ketamine
  - Pregabalin
NEUROMUSCULAR BLOCKERS

- Deep NMB
  - Minimise harm - robotic
  - Especially for HPB
  - Lower IAP -> less post op pain and cardiovascular instability
- Rocuronium (bolus or infusion)
  - Suggamadex
- Atracurium/cisatracurium infusion
- Vecuronium
ANTIEMETICS

- Multi-modal
EMERGENCIES, COMPLICATIONS

- **Surgical access**
  - Injury to abdominal content
  - Uncontrolled movements
  - Spontaneous powering on
  - Arcing from diathermy

- **Pneumoperitoneum**
  - Subcutaneous emphysema
  - Mediastinal emphysema
  - Pneumothorax
  - Retained gas – post op pain
  - Air embolism

- **Positional**
  - Compartment syndrome in legs – lithotomy
  - Oedema – face, eyes, upper airway
  - Post-extubation respiratory distress
THANK YOU
REFERENCES

- Anaesthesia for minimally invasive abdominal and pelvic surgery
  - BM Carey
  - BJA May 2019