Refresher Course: Quoted ERCP: sedation or general anaesthesia?

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Scope of ERCP

- Much of simple diagnostic endoscopic retrograde cholangiopancreatography (ERCP) now supplanted by magnetic resonance cholangiopancreatography (MRCP).
- Therapeutic ERCP growing exponentially: sphincterotomy; stenting as interim management in cholelithiasis; cholangitis; extrahepatic obstructive jaundice.
- Endoscopic ultrasound for screening and diagnosis of pancreatic and biliary neoplasms.

Implications of changing scope of ERCP

- Much longer procedures.
- More uncomfortable procedures – prone; more passages of endoscope; more insufflations; dilatation of ductal structures.
- Much sicker patients – cholangitis with systemic sepsis; malignancies; duodenal obstruction; severe jaundice with hepatic dysfunction.
- Largely in environments remote from theatre with limited support staff/facilities.
- More equipment and theatre technical staff – more difficult to access patient.

Options for sedation/anaesthesia

- Awake procedures with topical analgesia – only short diagnostic procedures.
- Conscious sedation (CS) – largely as for awake procedures. Surgeons do not mean CS when they ask for CS (“immobility and unresponsiveness with no endotracheal tube [ETT]”).
- Deep sedation – adequate for most procedures, but high rate of interventions to correct physiological derangements.
- General anaesthesia – universally applicable, especially the very young, high ASA, high body mass index (BMI), gastrointestinal bleeds, uncontrolled reflux, expected prolonged procedures, previous failed procedures, live workshops (unknown surgeon and procedure), conversion from sedation due to respiratory obstruction or procedural failure and duodenal obstruction.

Facts and figures about ERCP

Sickest, oldest patients, long procedures

- 50% ASA 3 or more – general co-morbidity and that related to hepatobiliary disease.
- Liver dysfunction – coagulopathy/metabolic disturbances/altered sedative pharmacokinetics and dynamics.
- Cholangitis with systemic sepsis.
- Malignancy – plasma protein changes; increased sedative sensitivity; venous thromboembolism.
- Ascites and pleural effusions – hypoxia and ventilatory problems.
- Delayed gastric emptying/duodenal obstruction.

Least comfortable position, procedure and venue

- Remote location from theatre and recovery room.
- Patient head/airway remote from anaesthetist/machine.
- Prone – higher rate of adverse respiratory events.
- Cold.
- Radiologists/radiographers as support in crisis?

Success of different anaesthetic options

- CS adequate for completion of 85-98% of cases.
- CS probably inaccurate description as:
  - 87% show no response to endoscope insertion.
  - 85% of ERCP show features compatible
Sicker patients likely to be done under GA.

- Quoted propofol doses of 9-13 mg/kg/hr are essentially general anaesthetic doses.
- Nonetheless, operators dissatisfied with quality of endoscopic field (inadequate sedation) in 61% of cases (1% for general anaesthesia [GA]).

- Should read “DS” every time “CS” mentioned in literature.
- GA halves procedure failure rate in therapeutic ERCP to ~ 7%.
- GA always chosen where previous sedated procedure has failed. 83% succeed under GA.
- Sicker patients likely to be done under GA.

Safety issues

- ERCP has the highest rate of adverse events of all endoscopic procedures.
- Bulk of sedation-related morbidity and mortality is respiratory (depression/obstruction) and some cardiac (more in higher ASA status patients).
- Greater proportion of ERCP sedation-related adverse events culminate in death than do GA adverse events (two- to threefold increase).
- Fifty percent of endoscopy sedation-related adverse events are deemed preventable by the courts.
- All-cause mortality in GI endoscopy 1:200. Includes full range of endoscopies, GI bleeds, ERCP in patients of all ASA grades.
- If ASA 4 and 5 patients excluded, all-cause mortality:
  - Upper endoscopy 4:10 000.
  - Diagnostic ERCP 6:10 000.
  - Therapeutic ERCP 1:1 000.
- No controlled trials to compare GA vs CS- or DS-related morbidity and mortality.
- DS related complications:
  - 15% require airway manipulation.
  - 13% develop hypoxaemia.
  - 0.5% develop hypotension.
  - 0.6% require termination of procedure for critical cardiorespiratory events.
  - Major risk factors for adverse events – male patients, high BMI, ASA 3 or more.
- Myocardial ischaemia occurs in 22% of sedated ERCP. No data for GA. Correlates with decreased coronary blood flow on perfusion scanning. Thought to be on a supply-demand basis (hypotension; hypoxia; hypercarbia and hyoscine-related tachycardia).

- Huge problem as to who sedates and how.
  - Single operator not an option for ERCP.
  - Nurse sedationist (nurse anaesthetist administration of propofol – NAAP)? Medical practitioner? Anaesthesiologist?
  - These are the sickest of patients with most co-morbidity; most disturbed pharmacokinetics and greatest challenges regarding location, position and access to the patient.

- Combination sedation – benzodiazepines and opioids and propofol – the most frequent option selected. Spells problems – see later.
- Frequent transition to DS/unintubated GA implies mandatory ACLS qualification.
- Worrying statements from endoscopy and nursing journals related to sedation:
  - From a study of 799 ERCP, all completed successfully under CS/DS; “despite occurrence of DS or GA in 87.2% of cases, there seems no indication for endotracheal intubation as there were no adverse outcomes in the group”.
  - Endoscopy journal – should respiratory depression or apnoea occur “avoid assisting ventilation as it may provoke aspiration; rather wait out the transient propofol-associated respiratory depression”.
  - Nursing journal: “using multiple (sedative) drug combinations allows achievement of sedation without the risk of sedation drug close related complications”.
- Whoever sedates had better not believe any of these!

Bibliography