Anaesthesia for thyroid surgery

Dr R Danha

Consultant anaesthetist

UHCW

Thyroid surgery

- Most frequently performed endocrine procedure in the world
- Recurrent laryngeal nerve palsy is one of the common and serious complications that can diminish the quality of life.
- Direct visualization of the nerve is the gold standard but intraoperative nerve monitoring is used increasingly as an adjuvant to help identify the nerve.

- Which investigations are specifically indicated in the preoperative assessment of a patient presenting for thyroidectomy for treated thyrotoxicosis? (5 marks)
- b) What particular issues must the anaesthetist consider during the induction, maintenance and extubation phases of anaesthesia for a euthyroid patient having a total thyroidectomy? (11 marks)
- c) Describe the specific post-operative problems that may be associated with this operation. (4 marks)

Investigations

- Bloods: FBC, U&E, Thyroid function to ensure patient is euthyroid prior to surgery.
- Group and save
- Guidelines regarding investigations:
- All medical societies recommend TSH assay and thyroid ultrasonography while patients with features suggestive of malignancy have fine needle aspirate (nodules >2cm)
- TSH assay sensitivity allows detection of all forms of thyroid disease

Anaesthetic considerations

- Pre-op assessment
- Identify any abnormalities of thyroid function – patients must be euthyroid prior to elective surgery
- Seek for evidence of tracheal compression and deviation
- ? Retrosternal goitre. Vast majority can be removed via the cervical route
- Difficult intubation ~ 6%. Presence of cancerous goitre major factor as infiltration decreases mobility of tracheal structures
- Awake intubation may be indicated in some patients

Induction

- Usually intravenous even in patients with large goitres.
- Gas induction difficult and awake intubation should be considered if the airway is predicted to be difficult.
- A smaller tube size (6 or 7) must be used when tracheal deviation and or narrowing is associated with goitre
- EMG (electromyogram) tube increases external diameter of the tube
- Reinforced and EMG tubes usually require use of bouigie to facilitate intubation

Induction

- Debate
- Induction with suxamethonium or small dose of non-depolarizing agent.
- If non-depolarizing agent used, confirm return of 4 twitches with train-of four nerve monitoring.
- Intravenous versus inhalational induction in patients with large goiters
- Awake intubation when airway predicted to be difficult.
- Tracheostomy not an option in airway rescue if intubation fails in a patient with a large goiter and tracheal deviation.

Drugs

- Avoid full paralysis as surgeons need to monitor the nerve.

- Remifentanil facilitates intubation, blood pressure control intra-operatively and depresses respiration as patient should not be given further doses of muscle relaxant.
- Anti-emetic drugs: ondansetron and dexamethasone (thyroidectomy associated with higher incidence of nausea and vomiting)
- Prophylactic antibiotics (not all surgeons)

Intubation

- Depending on size and location of goitre:
- Intubation may be difficult due to tracheal deviation, compression, narrowing and fixation by a goitre.
- Retrosternal goitres may cause airway obstruction proximal to the endotracheal tube.

Position in theatre

- Supine, head-up position.
- Neck extended using a bag under the shoulders.
- Head is supported on a head ring.
- Beware hyper extension of the neck
- The surgeon confirms the correct position of the EMG tube placement with a handheld sterile probe.

Maintenance

- Inhalational agent or TIVA depending on anaesthetist's preference.
- Remifentanil enables surgery to be performed without muscle relaxant.
- Most surgeons infiltrate with local anaesthetic with adrenaline
- Morphine up to 0.1 mg/kg
- Paracetamol IV
- Prophylactic antiemetics (vomiting can potentially put a strain on the surgical site with the risk of haematoma)
- At the end of the procedure, surgeons ask the anaesthetist to perform valsalva manoeuvre. This helps them identify any bleeders.

Monitoring

- Routine AAGBI monitoring including temperature, neuromuscular and blood loss.
- Neuromuscular monitoring must confirm that the patient is not paralysed when surgical monitoring commences
- Use of harmonic scalpel has reduced blood loss during thyroidectomy
- Not usually necessary to weigh swabs

Extubation strategies

- Deep versus awake
- Deep extubation was common when surgeons didn’t monitor the nerve and the anaesthetist checked the integrity of the recurrent laryngeal nerve
- It is no longer necessary to perform deep extubation
- Aim for smooth extubation without coughing.
- Patient must be transferred onto bed and extubated in sitting up position after ensuring that inhalational agent has been eliminated
- Regular respiration must be established before the patient is encouraged to wake up

Post operative problems

- Respiratory: Long-standing goitres may cause tracheomalacia
- Bleeding: usually immediate and monitoring in recovery includes checking how much blood is draining.
- Haematoma: prevented by meticulous haemostasis. Most patients have a drain for 18-24 hours post op.
- Hypocalcaemia (risk associated with accidental parathyroidectomy)
- Permanent hypoparathyroidism rates can be up to 2.7%

Recurrent laryngeal nerve damage

- Unilateral vocal cord paralysis occurs in 3-4% of patients with permanent damage in < 1%
- Bilateral damage is extremely rare
- Risk increases in cancer and re-intervention
- Electromyography (EMG) monitoring now standard practice.
- EMG electrodes positioned at the level of the cords

Complications

- Most common complication is hypoparathyroidism especially following total thyroidectomy
- Laryngeal nerve injury risk is 0.4-0.8%
- Mortality <0.5%
- Morbidity: parathyroidectomy risk is 3-5%
- Thyroid storm is extremely rare as patients should be euthyroid prior to surgery.
- Complication rate depends on time since operation, mode of detection and definition of complication