Anaesthesia

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Lec 1

Anaesthetic Assessment and preparation for surgery

Introduction

All patients should be seen by their anaesthetists sufficiently ahead of planned surgery to minimize all risks; this took place when the patient admitted usually the day before surgery. This visit also allowed the suitable anesthetic technique to be determined, with an explanation and reassurance of the patient. However, in the presence of coexisting illness, there would be a little time to improve the patient's condition before surgery or to seek advice from other specialists. More recently, introduction of clinics are specifically for anesthetic assessment.

Patients should be delicately assessed (Hx, Ex and Ix)

1. Who are controlled with medical treatment (HT, DM, Thyroid, …… etc)
2. Undiagnosed patients (HT, DM)
3. Who are less optimally managed (poor controlled Rx) DKA, Angina
4. Who have abnormal baseline Investigations. (may need further Ix echocardiograph, pulmonary function test)
5. Have previous anaesthetic difficulties (difficult intubation, anesthetic drug allergy)
6. Have potential anaesthetic complications (obesity, Hx of apnea after anesthesia)
7. Undergoing complex surgery with or without planned I.C.U. (Intensive Care Unit) admission postoperatively.

Anaesthetic Assessment

A. Present and Past Medical History

1. **Cardiovascular system:** keep in mind major medical problems:
   - Ischemic heart disease
   - Heart failure
   - Hypertension
   - Conduction defects (arrhythmia)
   - Peripheral vascular diseases

   Patients with proven history of MI are at a great risk of perioperative re-infarction, its incidence related to the time interval between infarction and surgery. Elective surgery should be postponed at least (6-8) weeks for uncomplicated MI and those with abnormal exercise tolerance test.

   Untreated or poorly controlled hypertension may lead to exaggerated cardiovascular responses during anaesthesia and surgery, both hypertension and hypotension can be precipitated, which increase the risk of myocardial and cerebral ischemia.

   The severity of HT will determine the action required

- Mild (SBP 140 – 159 mmHg, DBP 90 – 99 mmHg) No evidence that delaying surgery for treatment affects outcome.
- Moderate (SBP 160 – 179 mmHg, DBP 100 – 109 mmHg) Consider review of Rx. If unchanged requires close monitoring to avoid swings during anesthesia and surgery.
- Severe (SBP > 180mmHg, DBP > 109mmHg) At this level, elective surgery should be postponed due to significant risk of myocardial ischemia, arrhythmias and intracerebral hemorrhage. In an emergency will require acute control with invasive monitoring.

2. Respiratory system: Require specifically about:

- Chronic Obstructive Lung Disease
- Emphysema
- Asthma
- Infection
- Restrictive Lung disease (Kyphoscoliosis)

Patients with pre-existing lung disease are more prone to postoperative chest infections, particularly if they are also obese, or undergoing thoracic and upper abdominal surgery. If an acute upper respiratory tract infection is present, anaesthesia and surgery be postponed unless it is for a life-saving condition.

3. Other important conditions identified in the Hx

- Indigestion, heartburn and reflux increase risk of regurgitation and aspiration.
- Rheumatoid disease: limited movements of joints make positioning for surgery difficult. Cervical and tempero-mandibular joint involvement may complicate airway management. There is often a chronic anaemia*
- DM increase incidence of ischemic heart disease, renal dysfunction and peripheral neuropathy.
- Chronic renal failure and jaundice cause anaemia and electrolytes disturbance resulting in altered drug metabolism and excretion, restriction in choice of anaesthetic drug.
- Epilepsy, well controlled epilepsy is not a major problem just avoid epileptogenic drugs.
- Previous anaesthetic and surgical complications:

  Post-operative nausea and vomiting, post-operative jaundice, dreams, awareness, drug allergy or adverse drug reactions (such as malignant hyperthermia) and difficult intubation. Some patients may have been issued with a "Medic Alert" type bracelet or similar device giving details or a contact number.

- Family Hx about any inherited pathology (Sickle Cell Anaemia)
- Social Hx

♪ Cigarette smoking decrease Oxygen carriage capacity due to increased affinity between haemoglobin and carbon monoxide, resulting in tissue hypoxia. Also smoking stimulates autonomic nervous system causing in tachycardia, HT and coronary arteries narrowing. Never forget that smoking the cardinal risk factor for lung cancer. Quitting smoking 24 hours decrease CarboxyHb level, quitting 2 weeks reduce upper respiratory irritability and quitting for 8 weeks improve airway function.

♪ Alcoholism induces liver enzymes and tolerance for anaesthetic drugs.

♪ Drug abuse patients showing difficult IV access and concealed systemic infections (HIV).

♪ Pregnancy

The LMP date should be obtained in all women of childbearing (married) age. The anaesthetist may be the only person in theatre able to give this information if X-ray is required. Anaesthesia increases the risk of inducing a spontaneous abortion in early pregnancy also there is a risk of regurgitation and aspiration in late pregnancy. Elective surgery is best to be postponed until after delivery.

B. Examination

Concentrate on the cardiovascular and respiratory systems, other systems examined if problems relevant to anaesthesia have been identified in the Hx. Airway well examined, assessed and evaluated for any potential problems. If regional anaesthesia is planned, the appropriate anatomy (lumbar area) is examined.

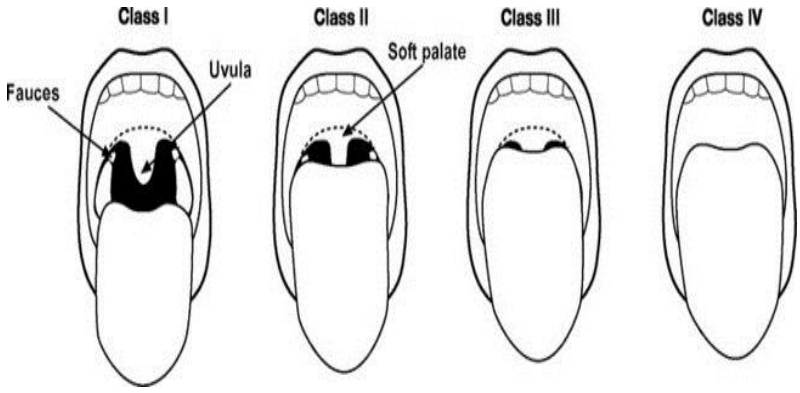
- Cardiovascular: HT, valvular, arrhythmia and heart failure.
- Respiratory: breathing sounds, effusion, impaired ventilation and emphysema.
- CNS: motor and sensory impairment.
- Musculoskeletal: movement restrictions and deformities.

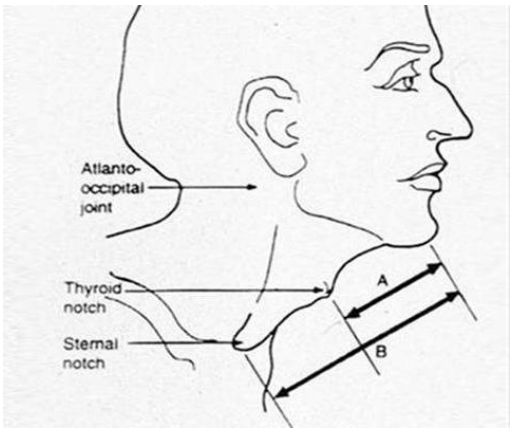
- Airway: mouth opening, tongue size, teeth health, receding mandible, neck soft tissue and deviation of larynx.

C. Bedside test

- Mallampati criteria: sitting upright patient asked to widely mouth opening with maximally tongue protrusion, view of pharyngeal structures is noticed and graded (I - IV), grade III and IV suggest difficult intubation.
- Thyromental distance (Patil's test): fully extended head, distance between bony point of chin and prominence of thyroid cartilage (Adam's apple) is measured, less than 7 cm suggests difficult intubation.
- Calder test: ask the patient to protrude his mandible as far as possible. The lower incisors will anterior to, aligned with or posterior to the upper incisors. The latter two suggest poor view of the larynx.
- Wilson score: increasing weight, reduced head and neck movements, reduced mouth opening and presence of buck teeth may suggest difficulty with intubation.

♪ ***None of these tests, alone or in combination predicts all difficult intubations***





D. Investigations: related to age group, past and present medical illness, extent of and classification of surgery.

Q: Doctor, what are the risks of having anaesthesia?

A: Minor:

- Failed IV access.
- Lip injury and teeth damage.
- Sore throat.
- Headache.
- Post-operative nausea and vomiting.
- Urine retention.

B: Major: life-threatening

- Aspiration of gastric contents.
- Hypoxic brain injury and cerebrovascular accident.
- Nerve injury.
- Chest infection.
- MI.

Table 2

American Society of Anesthesiologists General Classification of Physical Status

Physical Status	Description
1	Normal, healthy patient
2	Mild systemic disease without functional limitation
3	Severe systemic disease with functional limitation
4	Life-threatening severe systemic disease
5	Moribund, not expected to survive operation
6	Brain-dead organ donor
E	Emergency operation

Stages of anaesthesia Guedel's classification

Stage I (stage of analgesia or disorientation) from beginning of induction of general anesthesia to loss of consciousness.

Stage II (stage of excitement or delirium) from loss of consciousness to onset of assisted breathing. Eyelash reflex disappear but other reflexes remain intact and coughing, vomiting and struggling may occur; respiration can be irregular with breath-holding.

Stage III (stage of surgical anesthesia) from onset of assisted respiration to respiratory muscles paralysis.

Stage IV (brain death) from cessation of breathing till death. Anesthetic overdose cause medullary paralysis with respiratory arrest. Pupils are widely dilated and muscles are relaxed.

Classification of Surgical Operations:

1. Elective: operation at time suitable for surgeon and patient; hip replacement and varicose veins.
2. Scheduled: an early operation but not immediately life-saving; usually done within three weeks (surgery for malignancy).
3. Urgent: operation as soon as possible after resuscitation, done within 24 h; intestinal obstruction and major fractures.
4. Emergency: immediate life-saving operation, resuscitation simultaneous with surgical treatment; usually within 1 h such as major trauma, extradural haematoma and uncontrolled haemorrhage.