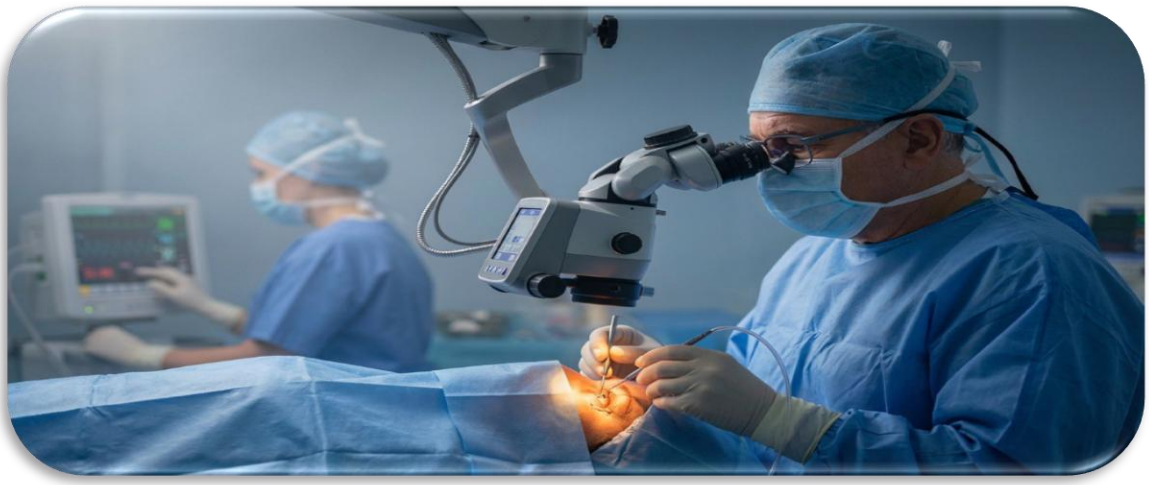
Al-Mustaqbal University

College of Health and Medical Technology

Anesthesia Techniques Department

Practical Lecture

Anesthesia for Ophthalmic Surgery



BSc. Anesthesia & Intensive Care

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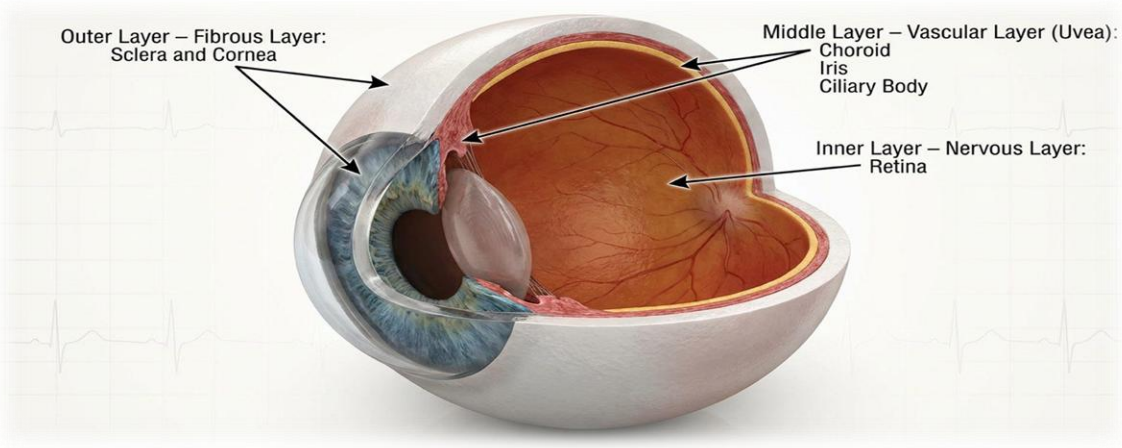
Ophthalmology is the branch of medicine that deals with the anatomy, physiology, and diseases of the eye.

- **anatomically divided into three layers:**

1. **Outer layer: Fibrous** layer (sclera - cornea)
2. **Middle: Vascular** Layer (Uvea: Choroid-Iris-Ciliary body)
3. **Inner: Nervous** Layer (Retina)



Anesthesia for ophthalmic surgery dramatically changed recently. Much cataract surgery is now performed under topical anesthesia only, and many other surgeries are performed under local anesthetic nerve block.

❖ When **general anesthesia** is used, the laryngeal mask airway has generally replaced endotracheal tubes.

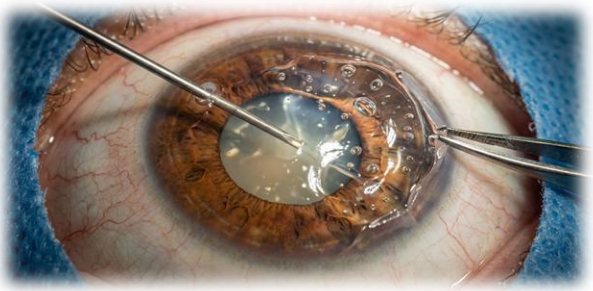
- **Intraocular pressure (IOP)**

Normal intraocular pressure is **10-20 mmHg**

Increased **IOP** after some eye surgeries (particularly cataract) is typically due to retained ophthalmic viscosurgical device solution, which is used to maintain the anterior chamber during surgical maneuvers.

❖ It may be lowered by:

1. Intravenous anesthetics (except ketamine).
2. Inhalational anesthetics.
3. Hypotension.



4. Hypocapnia.
5. Reduction in venous pressure, including head-up tilt .
6. Mannitol and acetazolamide.
7. Mechanical pressure on the eye to increase the absorption of aqueous humor.

• It may be raised by:

1. Hypertension.
2. Hypercapnia.
3. Raised venous pressure, including head-down tilt.
4. Suxamethonium (transient effect).
5. Local anesthetic block.
6. Ketamine (has a little effect).

• The oculocardiac reflex

- Traction on extraocular muscles, eyeball pressure, retrobulbar block, or ocular trauma may cause cardiac dysrhythmias.

- Bradycardia.
- Ventricular ectopy.
- Sinus arrest.
- Ventricular fibrillation.

• Reflex pathway :

- Trigeminal (V1) afferent.
- Vagal efferent.

- **Most common in pediatric strabismus surgery, but can occur at any age and during :**

- Cataract extraction.
- Enucleation.
- Retinal detachment repair.

- In awake patients: may be accompanied by nausea
- Prophylaxis is controversial, but ◦ Anticholinergics often help prevent the reflex, including: IV atropine or glycopyrrolate immediately before surgery, more effective than IM premedication.

Management of the oculocardiac reflex when it occurs includes:

1. Immediate notification of the surgeon and temporary cessation of surgical stimulation until the heart rate increases.
2. Confirmation of adequate ventilation, oxygenation, and depth of anesthesia.
3. Administration of intravenous atropine (**10 mcg/kg**) **if bradycardia persists.**
4. In resistant episodes, infiltration of the rectus muscles with local anesthetic. The reflex eventually fatigues (self-extinguishes) with repeated traction on the extraocular muscles.

General anesthesia

Indications for general anesthesia:

- Potential failure of cooperation by the patient, especially those with learning difficulties.
- Patient phobias, especially severe claustrophobia.
- Children.

- Long-duration operation.
- Various technical surgical problems

Important note:

- ❖ Premedication is not used routinely for eye surgery; a short-acting benzodiazepine may be given orally to anxious patients.
- ❖ Anticholinergic agents cause dry mouth/discomfort; not needed with premedication.
- ❖ More likely needed in strabismus or retinal surgery، Can be given IV after induction if necessary.
- ❖ Propofol: widely used for short duration, pleasant induction, reduced post-.op nausea
- ❖ Etomidate: useful in elderly/unhealthy patients (cardiac stability, reduces IOP, rapid recovery.
- ❖ Moderate hyperventilation reduces **PaCO2,** provides excellent operating conditions.
- ❖ The **Rae tube is preferred** in eye surgery.
- ❖ Early in the procedure, the surgeon should infiltrate a long-acting local anesthetic via the sub-Tenon's route.

- ○ Reduces anesthetic requirements.
- ○ Provides stable anesthesia.
- ○ Reduces the amount of general anesthetic needed.

Local anesthetic techniques

1. Topical: It is used for cataract surgery.
2. : Sub-Tenon block.

- Used for cataract surgery when an immobile eye is required.

- Often unsatisfactory for vitreoretinal surgery.
- A blunt cannula is passed into the plane between Tenon's capsule and the sclera to inject the local anesthetic
- Often administered by the surgeon without the help of the anesthetist.

3 . Retrobulbar block:

- Injection of the local anesthetic into the muscle cone behind the eye.
- Increasingly regarded as out of date and unsafe.
- Significant risk of perforation of the globe, hemorrhage, and intradural injection.

4. Peribulbar block:

- Can be a true extradural injection, allowing the local anesthetic to diffuse into the muscle cone, or into the intracanal space.
- Increasingly used in vitreoretinal surgery and other procedures where greater akinesia and analgesia are needed.


Thank you
for listening