

Introduction

The anesthesia used in a surgical procedure for glaucoma depends primarily on the surgeon's personal preferences. However, the complexity of the surgical procedure, the presence of other systemic clinical conditions and patient collaboration also play important roles.

A glaucoma surgical procedure, alone or in combination with phacoemulsification, can be performed under general or topical anesthesia, but more frequently loco-regional (retrobulbar, peribulbar, sub-Tenon) anesthesia is preferred.

Across the world, most surgeons perform these procedures under local anesthesia, with cardio-vascular monitoring and a venous line open available. It is advisable to have an anesthetist on call to manage any possible adverse events, despite these being extremely rare.

Sometimes it may be useful to associate low grade sedation to the local anesthesia. Using local (or topical) anesthesia has several advantages over general anesthesia:

- Lower morbidity and mortality associated with general anesthesia
- Lower incidence of nausea and post-operative vomiting
- Better cardio-pulmonary stability
- Rapid return to walking
- prolonged post-operative analgesia
- lower costs.

The most common agents used for local anesthesia are mepivacaine (duration of action: 45–90 min), lidocaine (duration of action: 1.5–2.5 h), bupivacaine (duration of

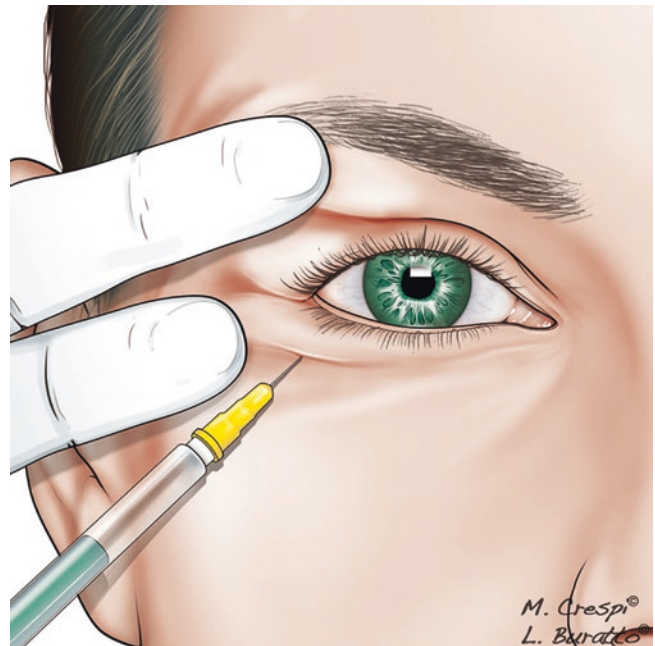


Fig. 2.1 Retrobulbar anesthesia used in glaucoma surgery

action: 2–4 h) and ropivacaine (duration of action: 2–6 h). The longer duration of action of ropivacaine gives the patient a couple of extra hours of post-operative analgesia.

The retrobulbar block is the elective choice for most surgeons, as a good degree of akinesia and analgesia can be achieved with a limited amount of anesthetic agent. Compared to peribulbar anesthesia, it reduces the possible increase of intraorbital pressure (Fig. 2.1).

Retrobulbar Anesthesia in Glaucoma Surgery

Generally-speaking, a blunt 25G needle is used (Atkinson retrobulbar needle Eagle Labs, Rancho Cucamonga, California). The technique can include also injecting 2 cm³ of the

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anesthetic agent into the eye's internal canthus. It is advisable to associate a small quantity of hyaluronidase (5 U/mL, that is 0.5–1 mL in the 10 mL syringe) to facilitate the diffusion of the anesthetic agent. Akinesia of the orbicularis muscle is achieved by slowing injecting 1.5 mL of anesthetic in front of the orbital septum.

In the event the surgeon opts for peribulbar anesthesia, four periconic injections should be performed in the four quadrants to allow a better distribution of the anesthetic agent.

Sub-Tenon anesthesia has the advantage of not increasing the intraorbital pressure, due to the small quantity of anesthetic agent injected (1.5 mL) and the disadvantage of a greater haemorrhage risk. Several different quadrants have been proposed for the injection: supero-temporal, internal canthus and infero-nasal.

In all cases of injected anesthesia, the block can be achieved by using 2% carbocaine (or 2% lidocaine) possibly in association with 0.50% Marcaine (1:1) if the procedure is expected to last longer than normal.

Digital eye massage consents better diffusion of the anesthetic solution and reduces the intraocular pressure (IOP); this is an important phase in the preparation of the patient for surgery. However, many surgeons do not apply this technique because they believe it induces an additional transitory IOP increase—dangerous for patients affected by glaucoma; pressure values are maintained at between 30 and 40 mm Hg for approximately 20 min.

If total eyelid akinesia is required, a facial nerve block can be associated (Van Lint).

Some authors use topical anesthesia—4% xylocaine and 0.5% tetracaine HCl; in this case, in addition to topical anesthesia, the surgeon may also opt for an intracameral injection of preservative-free 1% xylocaine. Good exposure of the

operating field can be achieved by asking the patient to look downwards.

Generally-speaking, surgeons will opt for a form of anesthesia that will produce total akinesia, considering the fine surgical maneuvers required as the scleral flap dissection.

General anesthetic is usually reserved for patients not suitable for local anesthetic—children, adults who suffer from claustrophobia, patients who are extremely anxious or affected by an altered mental state, those with a history of poor collaboration during previous surgeries under local anesthesia, patients affected by nystagmus, tremors or those patients who are unable to lie in a supine position for any length of time. Some surgeons prefer to use general anesthesia for great personal peace of mind during surgery; others consider local anesthesia to be associated with greater risk in some patients (those with serious blood-clotting disorders, or with very long eye bulbs, for example in cases of severe myopia or congenital glaucoma).

The above comments apply to all of the surgeries described in this book.

Bibliography

1. Husted RH, Hamilton RC, Loken RG. Periocular local anesthesia: medial orbitals an alternative to superior nasal injection. *J Cataract Refract Surg.* 1994;20:197–201.
2. Greenbaum S. *Ocular anesthesia.* Philadelphia: WB Saunders; 1997.
3. Vicari D, McLennan S, Sun XY. Tropical plus subconjunctival anesthesia for phacotrabeulectomy: one year follow-up. *J Cataract Refract Surg.* 1998;24:1247–51.
4. Anderson CJ. Circumferential perilimbal anesthesia for combined cataract glaucoma surgery. *Ophthalmic Surg Lasers.* 1999;30: 205–7.