

Comprehensive Monitored Anesthesia Care During Day Care Ophthalmic Surgery

PM Chandrasekhara

Department of Anesthesiology, Retina Institute of Karnataka, Bangalore, Karnataka, India

Abstract

Today elderly patients with complex health-related issues undergoing successfully a day care ophthalmic procedure are a common scenario. How can these high risk patients safely undergo an eye surgery and be back at home on the same day? This is possible, only when a well-planned, scientifically drawn protocol is in place at an institution. This plan of action takes into consideration every possible detail about the patient and also his or her special requirements if not demands. The anesthesiologist commands these well-set actions and guides the other health care staff to streamline the day care program, thereby sparing the busy ophthalmologist to attend to his clinical and surgical workload.

Key words: Comprehensive monitored anesthesia care, oculocardiac reflex, pre-anesthetic consultation

COMPREHENSIVE MONITORED ANESTHESIA CARE

Screening and Monitoring of aged patients under different categories depend on their health as well as other social issues. This initial step would help one to give different levels of care to a large number of patients during the day care ophthalmic procedures. Some institutions follow different color coded preoperative data sheets depending on the questionnaire that is provided at the time of first visit to the clinic or the hospital. For example, white data sheet may indicate that there is no systemic problem with the patient, whereas any other color coded data sheet would indicate that the patient is categorized as a high risk case, who needs a different level of attention and care as these patients may have various concurrent systemic conditions like uncontrolled diabetes, coronary heart disease, hypertension, chronic renal failure, lung disease, etc., These high risk patients have to update their medical records and also be thoroughly evaluated by the anesthesiologist.

Many ophthalmic procedures such as surgery for cataract, glaucoma, and lid are carried out under various types of regional blocks, starting from topical anesthesia to well-designed nerve blocks, using a combination of local anesthetic agents and adjuvants. Earlier, the anesthesiologist's role in day care ophthalmic surgery under regional anesthesia was considered to be marginal. This is no longer true as it is desirable that all such

high risk elderly patients should be monitored during surgery, and the term that is used nowadays is Monitored Anesthesia Care (MAC). In the present setting, the anesthesiologist's goal is to provide the surgeon with the best possible operating conditions and the patients with the safest and most pleasant experience. Thus, ophthalmic anesthesia practice in the elderly patient who is undergoing a day care procedure demands the balance of medical knowledge, technical expertise and physician-patient sensitivity. Presently, the Comprehensive Monitored Anesthesia Care (CMAC) is further extended to all types of ophthalmic surgical procedures that are conducted under regional anesthesia. This care starts from the time of registration to the time of discharge from the institution.

Preoperative considerations

When an elderly patient enquires about the ophthalmic appointment, the receptionist instructs the patient to report to the institution at an appointed time with his or her medical file. This first step is relevant, since these ophthalmic patients will be under the impression that there is no need to worry about their health record since the surgery is after all on the eye and not on the body. On reporting to the institution, the patient will undergo ophthalmic evaluation and then the patient is counseled for surgery. Once the proposed surgery is confirmed, the surgical team will complete the surgical part of the presurgery evaluation chart which is color coded as red for the right eye surgery and yellow for the left eye surgery, and the patient is referred to the Public Relations Officer (PRO). The PRO, after going through the records and the file, decides

Access this article online

Quick Response Code:



Website:
www.karnatakaanaesthj.org

DOI:
10.4103/2394-6954.149641

Address for correspondence: PM Chandrasekhara,
Department of Anesthesiology, Retina Institute of Karnataka,
Bangalore, Karnataka, India.
E-mail: pmc05_cardiac@yahoo.co.in

whether the patient needs a pre-anesthetic consultation (PAC) or check-up on the same day or a day before surgery depending on the complexities of the patient presentation and the need for additional specialist/physician clearance or additional investigations. Each patient would be instructed to visit his or her personal physician/cardiologist/diabetologist and obtain clearance in the form of a concise note, including a complete history, findings of the physical examination, a list of current medications, and any appropriate recommendation in view of impending ophthalmic surgical procedure. This file along with the pertinent laboratory and other investigation reports should be available for review by the anesthesiologist.

The routine anesthesia preoperative evaluation is intended to obtain current health-related information from the patient, and also an informed consent for the proposed treatment plan. Ideally, the anesthesiologist should have the opportunity to meet the patient and review the pertinent laboratory work at an appropriate time before the scheduled surgery. PAC also allows the anesthesiologist to identify potential problems in sufficient time to address, treat, and resolve them or to postpone the operation in a timely fashion. This important step would avoid undue disappointment and confusion to the patient and loss of time and resources to the surgeon and the operating facility. Pre-anesthetic evaluation is often accomplished in the pre-admission processing environment and enables the exchange of information between the physician and the patient to take place in a calm and unhurried manner. The more information the anesthesiologist could get from the patient, the better care one can provide. The anesthesiologist should explain the stepwise procedures that are carried out in the operation theater in clear non-technical language that the patient and his or her attender understands, with assurance at the time of the first meeting. If provisions are available, a small video or laptop presentation can be made showing the important steps of the procedure. If the patient is keen on re-viewing a step, then it should be allowed to clear his doubt. In addition, a booklet containing the vital information about the procedure that the patient is undergoing and also the do's and do not's is issued to the patient before parting. Paperless insurance coverage/other modes of payment, type of surgery, type of lens selected, etc., are also discussed and finalized. A color coded pre-anesthetic chart (red chart for right eye, yellow chart for left eye) is filled with information on vitals like blood pressure, Random blood sugar (RBS), weight, and, if possible, ECG and serum creatinine during the visit, which would become a reference document during the procedure and the subsequent procedures in the same eye or in the other eye. During counseling, the anesthesiologist should make it very clear and emphasize the fact that the patient should lie on his back for sufficient length of time during the surgical procedure and there will be a sheet on the face as shown in the video clipping. The suffocation feel will be taken care of by providing sufficient oxygen under the sheet. Thus, the problem of claustrophobia should be cleared beforehand instead of allowing it go out of hand once the patient is covered with a sheet during the surgery.

Medications that are taken for asthma, hypertension, angina, heart failure, and diabetes are continued till the day of surgery. The patients with longstanding hypertension and coronary artery disease should be taken seriously, since they are bound to cause problems due to ophthalmic medications in the form of eye drops [Tables 1 and 2] and also accelerated hypertension results in increased ocular morbidity such as retrobulbar or expulsive choroidal hemorrhage. Hence, it is unwise to undertake regional block with systolic blood pressure above 160 mmHg. Such patients are best managed by hospitalizing them a day before the surgery instead of postponing it on the day of surgery causing inconvenience to the entire team by derailing the schedule. Special care and planning is necessary in case of patients who are on dialysis, uncontrolled diabetics, one-eyed patients, the patients who cannot lie on their back, the patients with immune deficiency, and in case of children belonging to neonatal to school-going age.

Nevertheless, in the area of ambulatory surgery and managed care for a minor ophthalmic surgery under topical anesthesia, the anesthesiologist often meets the patient on the day of surgery. The surgeon must be aware of this likelihood and recognize that he or she and the office staff must take an active role in the pre-hospital phase of the patient's preparation for topical anesthesia. It is extremely important that the surgeon and anesthesiologist have a clear and mutual understanding of the guidelines of their respective practices of their institution. If the surgeon's office questionnaire or interview yields anything that may be of concern, a discussion with the anesthesiologist may be advisable. A healthy, asymptomatic patient presenting for elective cataract surgery requires minimum laboratory tests. Routine over-testing is unnecessary and costly, whereas under-testing can result in delays or cancellation on the day of surgery, which can be inconvenient. The key to the proper balance is a conscientious history taking and physical examination with judicious ordering of laboratory tests which provide the required information and help in decision-making. The preoperative assessment should address all the current medical conditions. Chronic conditions should be diagnosed, optimally managed, and stabilized. The operative question is: Can the patient's systemic condition be significantly improved by delaying the surgery? In making this decision, the nature of the surgery and the proposed anesthetic should be considered relative to the possible expected improvement. Likewise, if the patient is heparin-based dialysis dependent, the timing of the surgery becomes very important.

Once the preoperative assessment is completed and the pre-anesthetic chart is filled, the patient should contact the PRO, who will in turn explain about the two important issues that are mentioned in the admission card. The first is instruction to the patient regarding "nothing by mouth" (NPO) status. This should not be a problem for those who are scheduled under regional block. In most cases, patients are instructed to take their oral medications on the morning of surgery.

The second issue is the reporting time on the day of surgery. It is unnecessary and less than ideal care for a patient, particularly

an elderly person, to be rushed. The patient should be given the most accurate estimate possible of the expected time of surgery, and the arrival instructions should reflect that time. Here, the patient's preference with respect to the time at which the surgery is going to be conducted should be considered while scheduling the surgery as far as possible, so as not to upset his or her sentiments about the most "auspicious time" and other personal preferences.

On the day of surgery

The anesthesiologist meets the patient and reviews the pre-admission information, and then proceeds, reassuring the patient by explaining the procedure once again and also instructing the patient about what is expected out of him or her during the surgical procedure. If the patient desires and insists on wearing his hearing aid or dentures, it should be noted in the chart and he should be allowed to wear them during the block. It should be noted that the trend for most ophthalmic surgeries is toward the use of MAC techniques, that is, anesthesia monitoring with administration of appropriate intravenous medications in conjunction with local anesthetic drugs delivered by one of several techniques. This does not mean that the option of general anesthesia should be withheld from the patient. It is, however, especially important to document the thinking behind a decision that goes counter to the national and international norms. The surgeon and the anesthesiologist must be aware of the prevailing standard care, and this is yet another example of a situation in which it is advantageous to have a close working relationship. It is often beneficial for the surgeon to communicate with the anesthesiologist in advance, in order to avoid the possible confusion and loss of confidence.

Premedication

The patient posted for surgery will be apprehensive if not restless. Usually, the anxiety on the part of the patient scheduled for eye surgery is even more acute. Apart from detailed counseling and answering all the anxious questions, administration of premedication would be helpful in lessening the anxiety and enhancing amnesia during the regional blocks. These measures also increase the safety margin of the local anesthetics, apart from curtailing some of their side effects. While selecting the premedication, one should keep in mind the fact that these procedures are carried out on a day care basis and the patient should be ambulatory as early as possible. Usually, it is recommended to include an antihistaminic drug (H_1 receptor blocker) or a synthetic diazepam group of drugs like Tab. midazolam to provide sedation and protect against an increase in anxiety-related hypertension. Ranitidine (H_2 receptor blocker) and ondansetron ($5HT_3$ receptor blocker) are included to ensure reduction in volume and acidity of the gastric secretion. Pre-emptive analgesia is instituted in the form of an analgesic tablet from nonsteroidal anti-inflammatory drug (NSAID) group in the premedication. One should take care to avoid anticholinergic drugs like atropine or glycopyrrolate which make the patient restless and thirsty.

Supplementary anesthesia

Supplementation of anesthesia at the right time is the key to a successful outcome. If the patient is highly apprehensive and uncooperative, it will be futile to insist on local block; instead it is wise to take him or her into confidence and the block is carried out under adequate anesthesia coverage using intravenous anesthetic adjuvants like midazolam, tramadol, pentazocin, fentanyl, clonidine, or infusion of propofol or dexmedetomidine. One should avoid excessive sedation and loss of swallowing reflex during the surgery. The fluid instilled on the cornea or the irrigation fluid will find its way into the pharyngeal cavity through the nasolacrimal duct, leading to the possibility of aspiration unless it is well protected. Usually, "snoring" is taken as a rough guide to stop administering additional increments. Some surgeons do not like snoring during surgery, since the associated rhythmic movement of the head makes a sea of changes in the eye ball position under the microscope. Once the patient is on the table, he or she must be made as comfortable as possible by providing him or her proper cushions, blanket, etc., The nasal oxygen prong is fixed appropriately and about 2 L of oxygen is delivered. Likewise, ECG, SpO_2 , and non-invasive blood pressure (NIBP) monitoring are established. Intravenous cannulation of a suitable vein on the dorsum of the hand is carried out deftly and blocked with heparin or hepblock or an IV line is connected.

Conduct of the block

The local anaesthesia block is carried out while talking to the patient so as to divert his attention and, at the same time, it is wise to elicit some response now and then from the patient so as to know the level of cognitive function. Repeated aspiration before deposition of the drug avoids the possibility of inadvertent intravascular access.^[1] The type of block, drugs, and dosage used while blocking differ from institution to institution. Peribulbar or parabolbar (sub-Tenon's) block is preferred since these blocks are ideal and safe for the proposed procedure. The drugs selected are usually a combination of bupivacaine, lignocaine, adrenaline, ropivacaine, and hyaluronidase, with or without addition of adjuvants. After the block, some means of compression and massaging is instituted to facilitate even distribution of the drug. The onset of complete akinesia heralds the accomplishment of a successful block.

Complications of the block

The entire differential diagnosis of restlessness must be rapidly explored whenever there is change in the observed parameters during or immediately following an LA block. During reactions, airway obstruction with hypoxia and carbondioxide retention under the drapes are the possibilities. Occasionally, a patient may be in an intermediate state of disinhibition. This will require additional sedation or perhaps reversing the effect of some medication so that a meaningful communication can be re-established and cooperation restored.

As with other anesthetic techniques, it is, of course, imperative on the part of the anesthesiologist to be familiar with the

potential complications of the blocks used. He or she must be able to recognize, diagnose, and treat them without wasting any time. Of particular concern are retrobulbar hemorrhage,^[2] intravenous or intra-arterial injections of local anesthetic, and the late (5–10 min after the block) occurrence of respiratory arrest. Appropriate monitoring and contingencies for assistance when required should be in place in any location where patients are being blocked.

Inadequate block

The surgeon should not begin the procedure if he or she is not comfortable with the level of akinesia or if there is evidence that the level of anesthesia may not be satisfactory. The block can be supplemented through one of several techniques, but it must be understood that intravenous sedation cannot compensate for a poor block.

Oculocardiac reflex

Oculocardiac, oculorespiratory, and oculoemetic (oculogastric) are the three neuro-ophthalmic reflexes that pose a real challenge during ophthalmic anesthesia.^[3] The details of these have been enlisted in Table 3. Oculocardiac reflex can be seen in the setting of local or general anesthesia, but it is more common in the latter owing to an alteration in vagal tone associated with the general anesthesia. This reflex results whenever there is a pressure or traction on the eye ball and its structures. Commonest scenario is the traction on the extra-ocular muscles, especially the medial rectus, during retinal detachment or strabismus surgery. Oculocardiac reflex is common during the performance of a retrobulbar block, ocular trauma, or direct pressure on the tissue remnants in the orbital apex after enucleation, stretching of the muscles of the eyelid, or even cold irrigation of the eye. The afferent limb of this reflex is trigeminal and the efferent limb is vagal. The afferent pathway of the oculocardiac reflex is composed of fibers that travel through the short ciliary nerves to the ciliary ganglion, and then pass with the ophthalmic division of the trigeminal nerve to the trigeminal or gasserian ganglion. From this ganglion, both groups of afferent fibers terminate in the main sensory nucleus of the trigeminal nerve located in the fourth ventricle. The most common manifestation of the oculocardiac reflex is sinus bradycardia. A broad spectrum of dysrhythmias including junctional rhythm, A-V block,

ventricular bigeminy, wandering pacemaker, idioventricular rhythm, and asystole can occur. Current recommendations include judicious preoperative use of anticholinergic protection with atropine or glycopyrrolate, ECG monitoring, cessation of surgical manipulation if an arrhythmia occurs, and treatment of arrhythmias as needed with intravenous atropine, retrobulbar block, or both.

Oculogastric/emetic reflex

Postoperative nausea is the most common reason for readmission to the hospital after day care ophthalmic surgery. Postoperative nausea complicates 40–85% of cases without attempt at prophylaxis. Some studies have shown that

Table 1: Commonly used ophthalmic drugs with anesthetic implications

Drug	Mechanism of action	Effect
Acetylcholine	Cholinergic agonist	Bronchospasm, bradycardia Hypotension, salivation
Atropine	Anticholinergic: Mydriasis	Central anticholinergic syndrome
Cyclopentolate	Anticholinergic: Mydriasis	Disorientation, psychosis, and convulsions
Echothiophate	Cholinesterase inhibitor: Miosis	Prolongs the action of suxamethonium
Epinephrine	Sympathetic agonist: Mydriasis	Hypertension: Tachycardia
Phenylephrine	Decrease in IOP Mydriasis and vasoconstriction	Headache: Arrhythmias Hypertension, M. ischemia
Propranolol	Beta adrenergic blocking agent	Bradycardia, asthma, CCF, apnea
Timolol	Reduces IOP	

IOP: Intra Ocular Pressure, CCF: Congestive Cardiac Failure

Table 2: Special considerations for ophthalmic surgery

Patient requirements	Surgeon requirements
Elderly patients with concomitant disease	Still, cooperative patient
Very anxious/demanding	“Soft” eye with normal IOP
	Anesthesia
	Akinesia of globe and lids

IOP: Intra Ocular Pressure

Table 3: Neuro-ophthalmic reflexes*

Reflex	Pathway		Precipitating factors	Symptoms and signs	Prophylaxis and treatment
	Afferent	Efferent			
Oculocardiac	Long and short N to ciliary ganglion	Motor nucleus of vagus	Pressure, torsion, pulling on extraocular muscles	Sinus bradycardia Ectopic beats Sinus arrest	IM/IV atropine or Glycopyrrolate
Oculorespiratory	Same as oculocardiac	Via a connection between trigeminal sensory nucleus and pneumatic center and medullary respiratory center		Shallow breathing bradypnea or respiratory arrest	Controlled ventilation in children undergoing squint surgery
Oculoemetic		Reflex action	Traction on extraocular muscles	Vomiting	

*Source: Shashi kiran *et al.* (1999): Anaesthesia for ophthalmic surgery: Hospital; IV, 4

preoperative medication given before any manipulation of tissues dramatically reduces the incidence of emesis. One should consider prophylaxis with metoclopramide, droperidol, or a phenothiazine. Ondansetron can be used for patients with a positive history of postoperative nausea and vomiting (PONV) during the previous eye surgery. Controversy exists over the use of lidocaine for emesis control. Propofol is associated with less postoperative emesis and faster recovery.

Factors that may contribute to postoperative nausea, such as pain, intraocular pressure, intraoperative muscle manipulation, narcotics, and postoperative movement, should be kept to a minimum. The oculogastric reflex has been implicated by some researchers as a possible cause. It has been suggested that patients should not be forced to consume fluids because this may increase nausea. Most patients should not be asked to eat or drink postoperatively until they express a desire to do so. This practice, along with sensible first foods, will also serve to minimize this problem.

Claustrophobia

The surgical draping on the face is carried out with an explanation that care will be taken to see that the patient will not be suffocated and there will be an adequate flow of oxygen under the drapes. This problem of claustrophobia should be best identified before the onset of surgery. Often patients with less severe symptoms can be managed with reassurance, sedatives, draping as openly as the surgeon feels comfortable, and constant communication and contact throughout the procedure. This situation requires sensitive dealing and patience on the part of all concerned. There are special types of frames with provision for oxygenation available to counter this problem. Often the patient may become restless and uncooperative in the middle of the surgery. Certain elderly patients may not be able to tolerate the necessary position on the operating table for very long. Every effort should be made to make the patient comfortable before the start of surgery. Appropriate positioning of the table and placement of pillows or padding under the knees, neck, and so on are important, particularly for arthritic patients.

Obese patients, those with a history of congestive heart failure, and those with kyphoscoliosis or obstructive pulmonary disease may not tolerate supine position, and a compromise may be necessary. Preoperative familiarization of the procedure and preparation help a patient psychologically, but may not overcome real physical discomfort.

Postoperative hypertension

Postoperative hypertension may sometimes pose a problem, since the most common sources in the recovery period are pain from surgical site, poor preoperative blood pressure control, and a full bladder (mannitol). For the patient who is

hypertensive without complaints or without another identifiable cause, sublingual nifedipine will often be a satisfactory solution. In addition, if the pain is severe, the treatment options include oral analgesics, nonsteroidal anti-inflammatory agents, and narcotics. Pain referable to the eye itself, especially if accompanied with nausea, should prompt a consultation with the ophthalmologist in consideration of the possibility of increased intraocular pressure.

Postoperative course and discharge

Every effort should be made to achieve as smooth and undisturbed a postoperative period as possible. Patients who have had MAC with little or no additional sedation after the block are almost always able to leave the operation room into a postoperative area and will not require the services of the traditional recovery room. It is always a good practice to closely observe the patient for at least half an hour and to ensure that he or she has returned close to baseline in most major areas of vital function. The discharge criteria to declare a patient "home ready" are individualized from institution to institution. A reliable adult attender must always accept responsibility for the patient on discharge.

CONCLUSION

During day care eye surgery, the success of each step is dependent on the anesthesiologist's role in organizing a well-drawn protocol of CMAC. This protocol takes care of the patient from the time of first visit to discharge from the clinic or the hospital. In addition, CMAC prepares the patient to be comfortable, confident, and still during ophthalmic surgery. The surgeon would be able to accomplish the goals of the procedure without distraction. Few subspecialty practices demand the balance of medical knowledge, technical expertise, and physician-patient sensitivity required of the ophthalmic anesthesiologist. While ophthalmic anesthesia and the surgery can be safe and a simple procedure, if the warning signals are missed, disaster can strike like a bolt from the blue. It is always better to be well prepared for any eventuality, especially when a high risk patient is on the Table.

REFERENCES

1. McGoldrick KF. Anesthesia for Ophthalmic and Otolaryngologic Surgery. Vol. 172. Philadelphia: WB Saunders; 1992. p. 1-6.
2. Kelman CD. Foreword. In: Greenbaum S, editor. Ocular Anesthesia. Philadelphia: WB Saunders; 1997. p. 7.
3. Shashikiran. Anaesthesia for Ophthalmic Surgery. Hosp Today 1999;4:126-221.

How to cite this article: Chandrasekhara P M. Comprehensive monitored anesthesia care during day care ophthalmic surgery. Karnataka Anaesth J 2015;1:3-7.

Source of Support: Nil. **Conflict of Interest:** None declared.