

Retained Visual Sensations in Ophthalmic Surgery

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Retained visual sensation are visual perception or experiences encountered by the patient in the operated eye during surgical procedure. The regional techniques such as retrobulbar, peribulbar and subtenon's block involve administration of a considerable volume of local anaesthetic in restricted compartment of the orbit. The effects of regional techniques of anaesthesia on optic nerve function ranges from no perception of light to impaired visual activity, changes in visual evoked potential (VEP) or relative afferent pupillary defect. The proposed mechanisms for the effect are transient conduction blockade of the optic nerve, relative ischemia due to compression from anaesthetic volume, saturation of photoreceptor elements and retinal pigment epithelium, blur by post injection digital pressure and posterior globe indentation by anaesthetic volume causing hyperopia.

Retained visual sensations can occur during cataract, glaucoma, vitreous and lasik surgeries. These include perception of light, change in light brightness, flashes of light, one or more colors, movements, instruments, surgeon's finger or hands. The visual images are unique and are a combination of images of objects close to the eye but outside the eye (fingers, instruments) and entoptic phenomena produced by structures and objects on the corneal surface and in the eye. Dynamic factors like moving fluids and bubbles on the corneal surface and the eye as well and the moving instruments in the eye add to the changing kaleidoscope of colors and shapes.

During cataract surgery under topical anesthesia the ever changing shape and opacity of the lens as it is being emulsified, aspirated and extracted, as well as changes in the refractive state of the eye from phakic to aphakic and finally pseudophakic influence the focusing light rays on retina. Patient undergoing phacoemulsification under topical anaesthesia¹ perceive light, colors and changes in light brightness¹ when compared to those under regional analgesia. Glaucoma patients undergoing trabeculectomy, phaco/trab and valve devices implant can

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also see images similar to those experienced during cataract extraction. About 41 to 43% of patients undergoing glaucoma surgery² see surgical instruments and surgeon's hands compared to 7 to 26% of patients undergoing phacoemulsification; this is because the instruments in anterior chamber are not clearly seen as instruments are outside the eye (extra ocular). In phacoemulsification there is disruption and removal of crystalline lens, the optical elements are disturbed which does not occur in glaucoma. Glaucoma surgery does not disturb optical elements of eye and so refractive status remains unchanged allowing better perception. Retained visual sensations are less common during vitreous surgery³ and could be attributed to greater volume of anaesthetic agents and presence of severe preexisting retinal pathology. Patients who report intraoperative sensation of light, colors, moving objects have better postoperative visual acuity and it is correlated with macular function.

During lasik⁴ whether using microkeratome or femtosecond, patients may see flashes, colors, surgeon's hand or fingers during surgery. The deformation of cornea in excimer laser and lifting of the lasik corneal flap create visual images. In microkeratome during vacuum suction and corneal flap fashioning is done a high percentage of patients lose light perception compared to femtosecond lasik.

Retained visual sensations during ophthalmic surgeries can also be unpleasant and some patients find them frightening. The visual sensations can make the patients uncooperative and stimulate a sympathetic response in patients leading to tachycardia and increase in blood pressure. This in-turn can lead to undesirable effects in elderly and in patients who have associated systemic (cardiac) comorbidities. Also, these frightening experiences can decrease patient's satisfaction too.

Preoperative counseling⁵, verbal and picture illustrations was found to reduce the negative impact caused by the retained visual sensations. But, previous survey has confirmed that although many ophthalmologists are aware of this phenomenon, they do not counsel their patients.⁶ Judicious use of sedation reduces awareness to environment. Intravenous sedation with midazolam 0.015 mg/kg was found to reduce the ability to see and recall intraoperative visual images / sensations in patients undergoing phacoemulsification cataract surgery under topical anaesthesia.⁷ Patients sedated with midazolam experience less disturbances to the light emanating from the microscope.⁷ These in-turn can improve overall patient's satisfaction too.

Conflicts of interest

There are no conflicts of interest

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