Original Article

Phacoemulsification Under Topical With Intra-Cameral Vs Retrobulbar and Sub-tenon Anesthesia

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Purpose: To assess and compare the advantages of topical with intra-cameral anesthesia over retrobulbar or subtenon anesthesia in phacoemul-sification surgery.

Material and Methods: The topical anesthesia supplemented by intra cameral anesthesia was attempted on 537 cataract operations with phacoemul-sification surgery method. Our technique is described with additional precautions.

Results: All those patients operated under topical drops and intra-cameral xylocain surgery remained comfortable during surgery and felt no pain or any other discomfort throughout the procedure except in two cases, who felt pain during implanting folding Lens. All patients were happy and they liked the same procedure for contralateral eye.

Conclusion: During postoperative queries patients expressed satisfaction with cataract surgery under topical anesthesia.

Cataract blindness has been recognized for many centuries with potential surgical intervention varying from couching, extra capsular by needle pricking first ECCE, than intra capsular cataract extraction, with the introduction of cryo extraction, this became most popular method. These obtained limited success due to the complica-tions like vitreous prolapse, retinal detachment, macular edema, aphakic glaucoma[1], and also due to optical abbresions[2]. Planned extra capsular cataract extraction method was performed in 1700s by Jacques Daviel. Ridley implanted the first IOL implantation in 1949, which required intact posterior capsule for IOL support. In early 1970s ECCE began to replace ICCE.

Later invention of phaco emulsification by Kelman and with refinement of technology in late 1980s and early 1990s such as development of capsular rhexus, small size IOL, folding, and injectable intraocular lens has changed the scenario. Presently, it is the most common procedure throughout the world. With the change in design, material, viscoelastic and in the bag implantation has revolutionized the out come[1]. This procedure carried out under both local and general anesthesia[3].

Day care cataract surgery needs a local anesthesia and its demand is increasing[4] the major demand of cataract surgery are analgesia and akinesia. Facial nerve block and retrobulbar injection fulfill these demands when surgery is carried out under local anesthesia[5].

Now-a-days surgery is being performed under topical anesthesia and we supplemented it with intracameral anesthesia, it provides sufficient anesthesia similar to regional block (subtenon, retrobulbar, peri bulbar). It provides better visual outcomes immediately.

This study was conducted to assess and compare the advantages of topical with intra-cameral anesthesia over retrobulbar or subtenon anesthesia in phacoemulsification surgery.

MATERIAL AND METHODS

This study was conducted at the Sagar Eye clinic Larkana from 2001 to 2006. Keratometry was done by Topcon Keratometer, and axial length was measured by A-Scan with Ocuscan Alcon and SRK II formula was used to calculate IOL power. Total 537 cases are reported. In all cases universal II Alcon phacoemulsification was system used. Mostly cases were done under topical and intra-cameral anesthesia but retro bulbar subtenon anesthesia was reserved for uncooperative patients or having communication problem. Patients were directed to look at microscopic light through out the procedure. Tab. Xanax 0.5 mg was given two hour before surgery to relieve anxiety during surgery. Local anesthetic drops were instilled every ten minutes for three times before surgery. After all aspect measures, three steps 2.7mm main port was made at 10 O 'clock position with keratome on scleral site. Side port was made by 15 degree knife. Capsulorhexus was performed under viscoelastics, followed by hydro dissection and hydro delineation with 1% Xylocain preservative free (2% Xylocain + ringer lactate solution 50: 50 ratio), this solution, was also instilled on the cornea by assistant during the procedure. In hard nucleus and posterior sub capsular type hydrodissection was done with more care and hydrodelineation was not done. 0.9mm Micro tip was used with phaco power 70% and Vaccum between 270-300. Nucleus was divided in two pieces and rotated for further division; cortex was removed with irrigation and aspiration canula. After cataract extraction, incision was enlarged to 5.25mm or 6.5mm and small or 6.5mm size lens implanted in the bag, stromal hydration was performed. In some cases one suture was applied to avoid fish mouthing or approximate the margin. Acrysof multi piece lOLs were implanted with folding holding forceps through 3.4mm incision and single piece with Royale injector through 2.7 mm incision.

Postoperatively all patients were seen on next day, one week later and after three months, astigmatism was assessed by Cannon Auto refractometer R-F 10m, and subjective refraction. All patients were asked about their satisfaction from the procedure and pain intensity recorded.

RESULTS

All those patients operated under topical drops and intra-cameral xylocain surgery remained comfortable during surgery and felt no pain or any other discomfort throughout the procedure except in two cases, who felt pain during implanting folding Lens. On inquiring about topical anesthesia, all patients were happy and they liked the same procedure for contralateral eye. All the patients were fully satisfied who were previously operated on the contralateral eye for same procedure with other anesthesia. Subtenon anesthesia caused conjunctival chemosis, which resulted in difficult surgery and postoperative red eye while retrobulbar anesthesia was painful and both caused more anxiety and discomfort to the patient. One patient developed sudden cough during the procedure resulting in posterior capsular tear and vitreous in anterior chamber and some cortical matter left with posterior capsular flap. Anterior vitrectomy was performed with vitreous cutter and Foldable acrysof multiple piece IOL was implanted. Postoperative vision was good (6/9), round pupil with some visual disturbance due to posterior capsular floating flap, later lost to follow-up. He was diabetic, cardiac and arthritic patient also. Some patients required anterior vitrectomy due to the posterior capsular tear and vitreous prolapse, which was dealt with under same topical procedure conveniently or comfortably and no additional anesthesia was needed.

In all cases of small central tear posterior capsular IOL was implanted and in three Giant tear cases posterior capsular IOL was implanted in the sulcus and in four cases, patient's were left aphakic for secondary procedure. They were lost to follow-up.

One patient developed uncontrolled painful glaucoma (IOP 60 mmHg) one week post-operatively and vitreous was observed in anterior chamber. He was re-operated, anterior vitrectomy was done and eye became quite with normal IOP (10 mmHg). (Table 1-4)

DISCUSSION

The goal of cataract surgery is to perform safe, economical, short duration, complication free and comfortable operation to the patient with least or no postoperative hospital stay. It can be performed by phacoemulsification under topical anesthesia or no anesthesia as performed by Amar Agarwal[6]. Nadeem et al[3] injected 0.2-0.4 ml Xylocaine sub conjunctively at 12 O' clock position 3mm away from the limbus. We, performed most of our cases by phacoemulisification under topical anesthesia, and without superior rectus suture. Eye movements were controlled by second instrument, chopper, through side port.

Table 1:

Continuous capsulorhexus	482
Partial rhexus and partial can opening	55

Table 2: Anesthesia

Subtenon anesthesia	35
Retrobulbar	13
Topical & intracameral	489

Table 3: Complication and additional procedures

Complication and procedures	**n (%)**
Iris chewing	13 (2.4)
Dropped nucleus	3 (0.6)
Posterior capsular rent	23 (4.3)
Vitreous loss	18 (3.4)
P/C rent during IOL implantation	7 (1.3)
Vitrectomy: open sky method	11 (2)
Vitrectomy with vitrectomy cutter	7 (1.3)

P/C: Posterior Capsule

Table 4: Post-operative complications

Complication	**n (%)**
Up-drawn pupil	9 (1.7)
Vitreous in A/C	1 (0.2)
De-centered IOL	3 (0.6)

It is pain free and excludes chances of retro bulbar hemorrhage, globe perforation, optic nerve sheath hemorrhage, optic nerve penetration, Retinal detachment, inferior rectus muscle contracture and injury to inferior oblique muscle, central retinal artery and vein occlusion and optic atrophy. Despite of experience and taking all measures to control the risk factors it is not sure that eyeball movements will be controlled[3]. Retrobulbar anesthesia is a blind procedure and has been conventionally used for eye surgery since ages. In our cases some patients felt so severe pain with retrobulbar anesthesia that they were reluctant for same procedure on other eye.

Facial block is also painful and causes temporary deviation of mouth angle which causes, psychological anxiety to patients during the surgery so he or she must be assured properly.

Sub tenon anesthesia is safer than retro bulbar but in our cases it caused severe conjunctival chemosis and become difficult to perform surgery. So we reserved the procedure for uncooperative patients, it causes post operative red eye, unacceptable to patients. Although sub tenon anesthesia provides better control of pain but its application is more painful and causes chemosis and subconjunctival haemorrhage[7], which causes difficulty in surgery as well as post-operative red eye resulting in anxiety and unsatisfied patient. Martini E was also satisfied with topical anesthesia in his study[8].

In our cases for local anesthesia we started counseling patients from first clinic visit and explained them about the procedure to be performed and assured them that he or she will not feel a pain but only sensations during the surgery. We gave one tablet xanax 0.5mg two hours before surgery to relieve

anxiety. On operation table patients were instructed to restrict their eye movements and to look at microscope light. We gave intracameral anesthesia with 1% xylocain which provided sufficient anesthesia and completed the procedure uneventfully. Some patients felt pain with multiple piece folding lens perhaps due to tight or small incision. Patients were asked questions regarding feeling of pain or sensation. We observed that patients remained calm and quiet during the procedure with an additional procedure of anterior vitrectomy performed without further anesthesia. Some patients did not believe that surgery has been completed till the padding of the eye. We used the hydro dissection as intra cameral Xylocain 1% injection (2% xylocain and ringer lactate solution 50:50).

Apple DJ has stated that hydrodissection technique is a very useful and important surgical step in enhancing the removal of cortex and lens epithelial cells, reducing the PCO[9], so we used it for dual purpose, hydrodissection or hydrodelineation as well as anesthesia.

We reduced phaco power to avoid heat production and endothelial burn, and used high vacuum power to aspirate the nucleus.

Topical anesthesia is mostly reserved for foldable IOL but in our cases with addition of intra cameral, it provided sufficient anesthesia that we performed phacoemulsification with folding IOL implantation as well as 6.5mm rigid PMMA lenses very comfortably and safely.

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