

Phacoemulsification under Topical Anesthesia Alone Versus Topical Anesthesia with Subconjunctival Infiltration of 2% Lignocaine

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Purpose: To compare and determine patients and surgeon's comfort and satisfaction in Phacoemulsification under topical anesthesia with proparacain hydrochloride 0.5% versus subconjunctival infiltration of 2% lignocaine.

Material and Methods: The study was conducted in the department of Ophthalmology Allied and DHQ Hospitals, PMC Faisalabad from May 2008 to June 2009. 90 patients of cataract divided into two groups, A and B each containing 45 patients were included in this study. Phacoemulsification was performed on group A under topical anesthesia with proparacaine hydrochloride 0.5% and on group B under topical anesthesia alongwith subconjunctival infiltration of 2% lignocaine. All the patients in both groups were operated by same surgeon. The surgeon and patients satisfaction score was entered in a standardized Performa.

Results: 40 patients (88.89 %) in group A, felt no pain while 5 patients(11.11%) felt pain up to the extent that 0.5 cc of 2 % lignocaine was needed to infiltrate at the phaco port site in the conjunctiva and then the procedure of phacoemulsification was completed comfortably and pain free.

In one patient (2.22%) in group A, the nucleus dropped into the vitreous and was referred to vitreoretinal surgeon for further management. The mean phaco time was 2.1 minutes while mean operation time was 25 minutes.

In group B, the patients were operated after infiltration of 0.5 cc 2 % lignocaine injection in the conjunctiva at phaco port site. All the patients were operated pain free while 10 patients (22.22%) in this group showed bleeding at the phaco port site. This bleeding was managed with a swab on gentle pressure for two minutes.

The mean phaco time was 2.0 minutes and mean operation time was 25.0 minutes.

The extension of ccc was seen in 5 patients(11.11%) in group A and 2 patients(4.44) in group B .The posterior capsule rent was seen in 2 patients (4.44%) in A group and in 2 patients(4.44%) in group B.

Conclusion: The subconjunctival infiltration of 2% lignocaine injection near phaco port site is superior to topical anesthesia with proparacaine hydrochloride during phacoemulsification in ensuring patient's and surgeon's comfort. None of the patients in any group showed the complications as sometimes seen in periocular or retrobulbar anesthesia.

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Written history of cataract spans over 20 centuries. An African's and an Arabic oculist translated into Latin cataracta meaning; some thing poured underneath something the WATERFALL¹.

Early surgeons, performing couching had no idea of pushing something behind the pupil was the human lens. In 16th century Atoine Jan and Michel Pierre identified from autopsy specimen that the cataract was truly the crystalline lens itself².

The written proof of couching came from Susruta an Indian surgeon³.

Daviel performed extracapsular extraction from inferior limbus in sitting position⁴.

Pierre Francos shifted incision to the upper limbus while sitting on head side of patient.

The pharmacological mydriasis and planned iridectomy was introduced by Carl Himly⁵.

The next break through came in intracapsular surgery with the development of chemical zonulysis using an enzyme α -chymotrysin⁶.

Aphakic correction with contact lens started established from 1940. Harold Ridlely implanted first synthetic lens on November 29, 1949⁷.

First feeling of intact supports for IOL was urged by Cornelius Binkhorst.

Kelman introduced his phacoemulsifier in 1967 but many intracapsular surgeons were not convinced⁸. After that Robert Sinskey and John sheets were more popular in small incision ultrasonic surgery⁹.

Howard Gimbel introduced capsulorhexis first time¹⁰. Small incision closing sutures introduced by John Shepherd and later by Howard Fine¹¹. Kelman performed phacoemulsification into anterior chamber and D. Calvard, Kratz T performed phacoemulsification into the papillary plane¹². Endocapsular phacoemulsification was introduced by Shephard¹³.

Several studies have demonstrated that topical anesthesia provides satisfactory analgesia, comparable with regional blocks (retrobulbar, peribulbar and sub-tenon,s anesthesia)¹⁴.

MATERIALS AND METHODS

The ninety patients having cataract were divided into two groups A and B each having 45 patients. The age of patients ranged between 50 to 70 years. Both male and female patients with anterior, posterior, nuclear,

cortical or grade 1 to 3 cataract were included in the study.

Following patients were excluded from the study;

- Having history of trauma and ocular surgery
- Having corneal opacity
- Uncooperative patients^{aaa}
- Claustrophobic patients

Pre operative ocular and systemic assessments along with routine investigations were carried out. All the surgeries were done by the same doctor. The preoperative medicines included, 1 tab. diamox, 1 tab. Neo-k, 1 tab. valium 5 mg, 1 tab. levoflaxacin and these were given an hour before starting surgery to each patient. Every patient's pupil was dilated with eye drops of Alcaine, Mydracyl and Isonephine, half an hour before start of surgery.

A written informed consent was obtained from each patient on the day of surgery. The out come measures and criteria consisted of;

1. Patient satisfaction;
 - a. Very happy
 - b. Happy
 - c. Angry
2. Ease of surgery
 - a. Phaco time
 - b. Operative time
 - d. Conversion to ECCE
3. Complications
 - a. Extension of CCC
 - b. Posterior capsule rent
 - c. Vitreous loss and nucleus drop

The group A patients were operated under topical anesthesia (proparacaine hydrochloride 0.5%, Alcaine) instilled 6 times with interval of 5 minutes between each drop, after dilating the pupil before start of surgery. Patients were instructed to keep their eyes closed after instilling drops. The patients were instructed to lie supine on operating table with opened eyes while at the same time keeping their eyes stable. At operating table no topical, intracameral or subconjunctival anesthesia was given. One limbal 3.2 mm phaco port and two side ports about 0.8 mm were fashioned. The ccc was done with cystitome after filling anterior chamber with methyl cellulose. Hydro dissection and hydro delineation were done properly and then phaco started with observation of good phaco techniques and tips. Total phaco and surgery completion time, complications if any and satisfaction score was noted and recorded in the Performa.

The patients in group B were prepared in the same manner as above except in addition a 0.5 cc 2% lignocaine injection was infiltrated subconjunctivally near phaco port. No other type of analgesia was given. Then phaco time, total operation time, complications and satisfaction points were recorded in the Performa.

RESULTS

There were 45 patients in group A. The age of the patients was between 50 to 70 years (detail is shown in the table). Out of 45 in group A only 5 patients (11.11%) felt pain so severe that they required injection fo 0.5 cc of 2 % lignocaine at the phaco site and then the procedure was carried out. The extension of ccc was seen in 5 patients (11.11 %) out of total 45 patients while posterior capsule rent was seen in 2 patients (4.44%) this complication was managed with anterior vitrectomy and implantation of 6.5 mm IOL in the sulcus and incision was closed with 3 interrupted 10/0 sutures. In one patient nucleus dropped in the vitreous and was referred to vitreoretinal surgeon for further management. The average phaco time was 2.1 minutes while total operative time was 25 minutes.

In group B there were 45 patients and all of them were given 0.5 cc injection in the conjunctiva at the phaco port site. None of the patients felt remarkable pain. The 10 patients (22.22 %) out of 45 got bleeding at site of injection, which was managed with a micro swab pressure for 2 minutes. The extension of ccc was seen in 2 cases (4.44%) while posterior capsule rent was seen in 2 patients (4.44%) that was managed with vitrectomy and 6.5 mm IOL in the sulcus and the closure of incision was done with 3 interrupted 10.0 stitches. No nucleus was dropped in the vitreous. The average phaco time 2 minutes and total operative time was 25 minutes.

DISCUSSION

Cataract is most common form of treatable blindness. The most effective treatment modality now is extracapsular cataract extraction with IOL implantation. The phacoemulsification is the best option among small incision extracapsular cataract extraction and then foldable IOL implantation. There are different procedures to attain akinesia and analgesia e.g General and Local anesthesia (topical, subconjunctval, subtenon, facial, peribulbar, retrobulbar etc). The general anesthesia needs a long list of investigations for patient's fitness and at the same time expert anesthetist is required. The general anesthesia

may cause more complications in old age in contrast to local anesthesia.

Age and Sex determination

Group	Age range	Age n (%)	Sex n (%)
Group A	50-60	20 (44.44)	35 (77.78)
	61-70	25 (55.56)	10 (22.22)
Group B	50-60	22 (48.89)	38 ((84.44)
	61-70	23 (51.11)	70 (155.56)

Satisfaction Score

Parameters	Topical Group	Sub. Conj. Group
Mean phaco time	2.1 MIN	2.0 MIN
Mean operating time	25.0 MIN	25.0 MIN
Pain score	11.11%	0 .00%
Extension of CCC	11.11%	4.44%
Posterior cap. Rent	4.44%	4.44%
Nucleus drop	2.22%	0.00%
Bleeding at phaco port	0.00%	22.22%
Foldable IOL	74.77%	88.89%
Rigid IOL	20.00%	11.11%

The periocular anesthesia, weither retrobulbar or peribulbar carries with it the risk of globe perforation and retrobulbar hemorrhage¹⁴. There are other available reports about the complications of peribulbar anesthesia as optic nerve transaction and brain stem anesthesia¹⁵. An other alarming complication noted was diplopia¹⁶.

The conversion from peribulbar to topical anesthesia created a lot of questions and reservations in the mind of surgeons due to lack of akinesia. It is very difficult to do phacoemulsification on a patient who is hard of hearing. Therefore we also excluded the patients who were hard of hearing especially from

our topical group A. In one study an author mentioned Phacoemulsification on a patient who was hard of hearing¹⁷.

Power of IOL Implanted

IOL Power in Diopters	Group A n (%)	Group B n (%)
0 to 10	0 (0)	0 (0)
10.5 to 15	2 (4.44)	3 (6.66)
15.5 to 20	4 (8.88)	6 (13.33)
20.5 to 25	25 (55.55)	27 (60)
25.5 to 30	12 (26.66)	7 (15.56)
30.5 to 35	1 (2.22)	2 (4.44)
Total	44 (97.78)	45 (100)

All the patients disliked peribulbar anesthesia due to needle puncture or pain. But all the patients were happy with subconjunctival or topical anesthesia. Some surgeons found patients had pain and stress in the topical and peribulbar anesthesia¹⁸.

Our phaco time and operation time was comparable to another study.

In another study it was concluded that both the topical and sub-tenon anesthetics were well accepted methods of providing local anesthesia for small incision self-sealing phaco emulsification cataract surgery the topical anesthesia was less invasive and quicker to administer than sub-tenon infiltration but all the acceptance lied on the patient's comfort during the procedure¹⁸

The topical anesthesia was compared with sub-tenon anesthesia in a study and the surgeon needed augmentation of topical anesthesia with subconjunctival injection of 2% lignocaine, 2 mm posterior to the superior limbus, to facilitate painless cautery of the scleral vessels¹⁹. But we needed no cautery in our study. We needed subconjunctival lignocaine injection for extension of incision in three cases.

Fichenhas investigated the blood pressure, pulse rate and respiratory rate of patients during surgery under topical anesthesia and has found no major changes in these parameters²⁰.

Lignocaine 2% gelly has been used for providing topical anesthesia in phaco emulsification in various studies²¹.

CONCLUSIONS

We concluded the following facts;

TOPICAL ANESTHESIA

1. Is safe and time saving.
- 2- Some patients felt pain and lignocaine injection was needed.
- 3- It is convincing and patients showed good compliance.
- 4- Lack of akinesia was controlled by patient cooperation and phaco technique.
- 5- IOP remained the same
- 6- Phaco time and operation time was same as in sub-conjunctival group.
- 7- It caused no post operative redness.

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