ORIGINAL ARTICLE

CATARACTA NIGRA (BLACK CATARACT): A CHALLENGING TASK MADE EASY WITH SUTURELESS MANUAL EXTRACAPSULAR CATARACT EXTRACTION

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Background: Cataract surgery is constantly evolving and various procedures having their merits and demerits are practiced by ophthalmologists all over the world. The objective of this study was to evaluate the safety, efficacy, visual outcome and complications of sutureless manual extracapsular cataract extraction (SMECE) in the management of patients with black cataracts using envelop anterior capsulotomy and soft shell technique. **Methods:** In a prospective observational study conducted at Khyber Institute of Ophthalmic Medical Sciences, Hayatabad Medical Complex, from January 2008 to December 2009, a total of 125 consecutive patients with black cataract underwent cataract extraction using SMECE with an envelop or V-type anterior capsulotomy and soft shell technique. Their operative, postoperative complications, visual outcome and efficacy were analysed. **Results:** Of 125 eyes with black cataracts SMECE was performed through a 12 O'clock sclerocorneal tunnel. The main Intraoperative complication was hyphaema in 10 (8%) patients. Postoperatively 9 (7.2%) patients had hyphaema. Fifteen (12%) eyes had some amount of striate keratitis superiorly. Twenty (16%) of patients had mild iritis. On 6th week follow-up 100 (80%) patients achieved uncorrected visual acuity of 6/6 to 6/18. **Conclusion:** SMECE with envelop or V-type anterior capsulotomy and soft shell technique is a safe and effective technique of cataract extraction in Cataracta Nigra (black cataract).

Keywords: Cataracta Nigra, sutureless/extracapsular cataract extraction, SMECE, visual outcome

INTRODUCTION

In Pakistan there are estimated 1.25 million blind individual of all ages. Latest estimates of the prevalence of blindness among individual of all ages in Pakistan is 0.9%.[1] The estimated number of blind individuals of all ages in Pakistan in 2003 was estimated to be 1.25 million. Cataract accounts for the most common (51.5%) cause of avoidable blindness.[2] Most patients had advanced stages of cataract with black, intumescent, mature or hypermature lenses. Poor socioeconomic factors and low literacy rate result in delayed presentation of these patients. A dark nucleus with colour of molasses or a cola soft drink, present special surgical challenges. These cataractous lenses usually have little to no epinucleus; the epinucleus is stiffened and become part of the nucleus. The posterior capsule therefore has no protection from the sharp and bulky nuclear fragments and instrumentation. In addition the posterior capsule is usually thinner and more vulnerable because the advanced cataract stretches the capsule as the cataract expands. The zonules are also weak making the surgery technically more difficult.

Majority of these socioeconomically backward patients cannot afford procedures like phacoemulsification. Moreover expertise in dealing with rock hard cataract using phacoemulsification is also lacking. Conventionally, in the last millennium extracapsular cataract extraction with intraocular lens implantation (ECCE with IOL) was considered an effective means of restoring visual function and improving vision related quality of life in developing countries.[3] However, it has its own problems related to wound suturing with its associated complications and late visual rehabilitation.[4] Sutureless manual extracapsular cataract extraction offers a good and effective alternative in this situation. To obtain the advantages of self-sealing sutureless incision at low cast, ophthalmologists in developing world are showing a lot of interest in this type of surgery. Keeping in view the size and hardness, managing the nucleus extraction in black cataracts with SMECE is really challenging.

This study reports the results of a prospective observational study done to assess the safety and efficacy of SMECE in Cataracta Nigra (Black Cataract) using envelop caspulotomy and soft shell technique.

MATERIAL AND METHODS

This study included 125 eyes of 125 consecutive patients with black cataracts who had SMECE procedure at Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Peshawar from January 2008 to December 2009. The study was approved by research and ethical committee of KIOMS. The inclusion criteria were all black cataracts with healthy cornea as examined under high magnification of slit-lamp and without apparent coexisting ocular co-morbidity. All patients having other types of cataracts, chronic adenexal diseases, corneal opacities large enough to block proper visualisation of details posterior to cornea, pseudoexfoliation, small pupil, long standing glaucoma, previous ocular surgery, diabetics, and retinal

detachment evident on B-Scan ultrasonography were excluded from the study.

Pre-operative examination like detailed slit lamp examination, tonometery, keratomerty, A-scan biometry, B-Scan ultrasonography in relevant cases, and routine preoperative laboratory investigation like blood sugar, (random, fasting), HBs, and HCV screening were done one week prior to surgery.

After mydriasis with topical tropicamide and phenyliphrine 10%, peribulbar anaesthesia having a combination of 2% lignocaine with adrenaline and bupivacain was administered. All surgeries were performed by a single surgeon. After cleaning the operative field with 10% povidone iodine, applying opsite and speculum a fornix base conjunctival flap was created superiorly. Haemostasis was achieved by applying gentle bipolar cautery. A partial thickness 6–6.5 mm frown shaped incision was given 1.5 mm behind the limbus. Scleral tunnel was fashioned using a crescent knife and extended up to 1.5 mm into the clear cornea. Additional side port entries were made at 9 O'clock and 3 O'clock with 3.2 mm keratome. Through the side port entry viscoelastic was injected into the anterior chamber to protect endothelium during caspulotomy and tunnel completion. Anterior envelop caspulotomy was performed with a 26 gauge bent needle mounted on 1 cc disposable syringe. Entry into anterior chamber was made at 10 O'clock position with the same needle for caspulotomy to prevent anterior chamber collapse while doing caspulotomy.

A 3.2 mm keratome was used to access the anterior chamber and internal corneal incision was made 1.5 mm anterior to the limbus. Gentle hydrodisection was done with a 24 gauge hydrodisection cannula. While doing hydrodisection, the superior edge of the bulky nucleus was elevated with the tip of cannula and made to rotate freely in a clock wise direction with sinsky hook until it was dislodged from the capsular bag. In this manner the nucleus dislocated easily in the anterior chamber. Viscoelastic was injected behind and in front of the nucleus. Pressure was created in the anterior chamber by injecting more viscoelastic at 6 O'clock from one of the side port entry. A gentle pressure was applied on posterior lip of the tunnel to open the valve for exit of the nucleus. As the wound opened, pressure in the anterior chamber pushed the nucleus towards the sclerocorneal tunnel making the delivery of the nucleus comfortable without posing any threat to posterior capsule or endothelium. Remaining cortex was aspirated with simco cannula and a 6 mm optic PMMA IOL was implanted in the capsular bag and inflated with viscoelastic. Anterior caspulotomy was completed by giving a nick in the anterior capsule and engaging it in the simco cannula. After ensuring the integrity of the self-sealing wound the conjunctival flap was apposed with bipolar cautery. Patients received combination of topical antibiotic (tobramycin) and steroid (dexamethasone) eye drops for a minimum period of 6 weeks. Follow-up was done at first week, 4th week, and 6th week postoperatively. All variables including operative and postoperative events were entered in a standard proforma. The data was analysed using SPSS.

RESULTS

Of the 125 eyes operated 60 (48%) underwent surgery in the right eye and 65 (52%) in the left eye. Majority of the patients in our study were males (Table-1). Pre-operative visual acuity of all patients ranged from hand movement (HM) to perception of light (PL) and were in WHO blindness category. All study subjects had a cola soft drink colour cataracts. All patients under went the same procedure of SMECE. Envelop or V-type anterior caspulotomy was done in all cases. Two (1.6%) eyes had superior iridodialysis during delivery of the nucleus and 10 (8%) had Intraoperative hyphaema. Postopreratively 15 (12%) eyes had mild oedema superiorly, 20 (16%) eyes had mild iritis (Table-2). All eyes except one (99.2%) had intraocular lens in the bag. All patients including those having some of the complications were discharged on the second postoperative day. All complication resolved on fist follow-up visit. On 6th week postoperative visit majority of study subjects achieved an uncorrected visual acuity (UCVA) of 6/6 to 6/18 (Table-3). Those who presented with UCVA of less than 6/18 had age related macular degeneration and unrecognised glaucomatous neuropathy.

Table-1: Gender and age distribution (n=125)

Sex	Patients (%)	Mean Age (Yr)
Male	90 (72%)	74.2±10.2
Female	35 (28%)	72±9.5

Table-2: Complication on 1st postoperative day (n=125)

Complications	Numbers	%
Corneal oedema with DM folds >10	6	4.8
Corneal oedema with DM folds <10	15	12.0
Mild iritis	20	16.0
Moderate iritis	7	5.6
Hyphaema <1/3 of A/C	5	4.0

DM: Descement membrane, A/C: Anterior chamber

Table-3: Pre-operative and 6th week postoperative uncorrected visual acuity (UCVA) (n=125)

Visual acuity	Pre-operative V/A	Post-operative V/A
6/6–6/18	0 (0%)	100 (80%)
6/24–6/60	0 (0%)	25 (20%)
Worse than 6/60	125 (100%)	0 (0%)

V/A: visual acuity

DISCUSSION

Cataracta Nigra poses special surgical challenges. Performing surgery on rock hard black cataract tests the skill and experience of the surgeon. A decision

has to be made in selecting the basic surgical strategy to overcome the challenges prior to surgical intervention. Our study demonstrates that SMECE with envelop caspulotomy and soft shell technique can be performed safely in patients having large black cataract. The chances of intraoperative complications are high in the hands of surgeon who occasionally deals with such cataracts. Therefore surgeons operate for conventional extracapsular cataract surgery or SMECE rather than phacoemulcification.[5–7] Ogino *et al* found greater endothelial cell loss after hard cataract emulsification than after manual extracapsular cataract extraction. They consider hard cataract to be contraindication to phacoemulsification.[5]

All 125 eyes recruited for the study had a large size nucleus. There was no red reflex having a poor contrast between anterior capsule and the underlying nucleus. All cases underwent SMECE technique. As the nucleus is big, capsule is thin and stretched, envelop caspulotomy is found to be safe and effective in tackling such situation. In SMECE envelop caspulotomy make the difficult step of nucleus prolapse out of capsular bag safe and effortless. We did envelop caspulotomy safely in all patients. Our study demonstrates that SMECE achieved good visual outcome 6/6–6/18 in 80% of study subjects. Final visual outcome on 6th week postoperative visit was good in 80% of patients having uncorrected visual acuity of 6/18 or better. This compares well with other studies conducted in Pakistan,[8] India,[3,9] and Ghana[10] showing 93.48%, 77%, 78.4% and 72% respectively at 6th and 8th week follow-up. The complications rate was low because of soft shell technique and minimum amount of instrumentation.

CONCLUSION

SMECE with V-type anterior caspulotomy and soft shell technique is a safe and effective technique and protecting corneal endothelial cells during cataract extraction in Cataracta Nigra (black cataracts).

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