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OUTCOME AND BENEFITS OF SMALL INCISION CATARACT SURGERY IN JOS, NIGERIA

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ABSTRACT

Background: Cataract is the most common cause of blindness and cataract surgery is a common procedure. There is a need for a low cost, safe and effective form of cataract surgery for the developing world. This study reports the outcome of small incision cataract surgery in a developing country.

Methods: Eyes without coexisting ocular disease but with mature cataracts were operated upon. Small incision cataract surgery technique was used and patients were prospectively followed up. The procedure involved whole nucleus delivery through a sclerocorneal tunnel wound and insertion of a posterior chamber lens. Eyes examined at five days and six weeks after surgery are reported on for uncorrected visual acuity, complications of surgery and causes of poor outcome where applicable.

Results: Seventy-one eyes were included in this study. Uncorrected visual acuity at five days postop was good in 31(43.7%) eyes and 49 (69.0%) eyes after six weeks of surgery. Six weeks postop, four (5.6%) eyes had poor outcome. The most common intraoperative complication was rupture of the posterior capsule while retinal lesions were the most common cause of poor visual outcome.

Conclusion: Small incision cataract surgery offers faster visual recovery, is cost effective and has the prospects for increasing the uptake of cataract surgery in a developing country.

Key words: small incision, surgery, cataract, outcome. *(Accepted 19 September 2006)*

INTRODUCTION

Cataract is the most common cause of blindness and cataract surgery has been one of the most common eye surgeries performed worldwide.[1] While phacoemulsification offers faster visual recovery and better-uncorrected vision than sutured extracapsular cataract extraction (ECCE) it is however, thought to be of limited role in most of the developing world in view of the cost of equipment and consumables, the high proportion of eyes with dense nuclei and mature cataracts.[2] Thus, sutured ECCE is the most common form of cataract extraction practiced in the developing world. Since the cost of surgery is a common barrier to accessing surgery and cataract backlog is increasing, there is a need for an efficient high volume system utilising low cost, able to tackle advance cataracts with minimal complications and effectively using the scarcest and most precious asset of the system- the cataract surgeon.[3] Small incision cataract surgery (SICS) has been shown to be cost effective, offers similar advantages as phacoemulsification, and has been shown to be faster and cheaper than sutured ECCE while also being a safe and effective procedure.[2, 6]

We are unaware of reports of the outcome of SICS in our environment. This study aims at evaluating the past one year and five months of this procedure at the Jos University Teaching Hospital, Jos, Nigeria.

MATERIALS AND METHODS

This is a prospective study carried out between January 2004 and May 2005. Patients diagnosed with mature cataracts and who had no diagnosed coexisting eye disease were included in this study. Persons with traumatic or congenital cataracts were excluded, also excluded were patients who did not show up for review at five days and six weeks after surgery. Cataract was diagnosed after a clinical examination that involved visual acuity assessment and slit lamp biomicroscopy. Visual acuity assessment was with the Snellen chart, ability to count fingers, see hand motion or perceive light from

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a pen torch. Intraocular lens power inserted depended on availability. Surgery, performed by one surgeon (CM) was with x10 fixed magnification-operating microscope and consisted of the following steps:

1. Retrobulbar and facial nerve block with 2% Xylocaine.
2. Eye preparation with 5% Povidone iodine, lid speculum was inserted and superior rectus fixated.
3. Fornix-based conjunctival incision and wet field cauterization for haemostasis.
4. Frown scleral incision at least 2mm behind the limbus and 6-8mm in width using a razor blade fragment, the internal opening was wider.
5. A sclerocorneal tunnel was done using a crescent knife.
6. A paracentesis was done at 9 o'clock position; this will be used to reform the anterior chamber later.
7. Opening into the anterior chamber through the sclerocorneal tunnel was done with a keratome, and widened beyond the external opening.
8. Anterior chamber was filled with viscoelastic and a can-opener capsulotomy was performed.
9. After hydrodissection, the nucleus was mobilised into the anterior chamber with a lens dial.
10. Viscoelastic was introduced above and below the nucleus and the nucleus was delivered with the aid of a lens loop pressing the posterior lip of the wound while the eye was turned downwards.
11. Residual cortex was aspirated using the Simcoe cannula.
12. The anterior chamber was filled with viscoelastic and a posterior chamber lens inserted. Viscoelastic was aspirated and anterior chamber refilled through the sclerocorneal or paracentesis wound.
13. A subconjunctival injection of 20mg gentamicin and 2mg dexamethasone was given, and the eye padded.

Patients were discharged a day or two after surgery while day cases came from their homes for review. Subsequently, all patients were reviewed five days and six weeks after surgery in the outpatient clinic. Presenting visual acuities and complications at 5 days and 6 weeks were recorded and reported for uniformity. Visual acuities were classified according to WHO definitions of good (6/18 or better), borderline (<6/18 6/60) or poor (<6/60).

RESULTS

Patient characteristics

One hundred and sixteen eyes had sutureless ECCE out of which seventy-one fulfilled the criteria for inclusion in this study and were analysed.

The ages of the patients ranged between 28 and 85years. The mean age of the study population was 62.2yrs (S.D ±11.8) with 65yrs as the modal and median age. There were 33 females (46.5%) and 38 males (53.5%).

Surgical characteristics

The left eye was operated upon in 62% (44 eyes) of cases and the right eye in 38% (27 eyes) of cases. The mean intraocular pressure preop was 14.9mmHg and postop was 12mmHg. The powers of intraocular lenses used ranged between 18 and 22.5 dioptres. The most commonly used lens power was 19.0 dioptres. Three patients had primary posterior capsulotomy because of thick posterior capsule plaque.

Complications

Posterior capsule rupture occurred in three eyes (27.3%) intraoperatively but all had posterior chamber lenses inserted, as there was no vitreous humour prolapse. In two other eyes, there was premature entry into the anterior chamber with surgical hyphaema. Hyphaema was washed out intraoperatively. The most common complication after surgery was corneal striae in four patients (36.4%), while two patients (18.2%) had hyphaema. Table 1 shows the complications encountered.

Visual acuity

All patients operated upon were blind before surgery; 24 (33.8%) could count fingers at one meter, 35 (49.3%) could see hand motion and 12 (16.9%) could perceive light from a pen torch.

Visual acuities five days after revealed that 31 (43.7%) eyes already had good vision, this improved to 49 (69.0%) eyes at six weeks after surgery without refraction. Fourteen eyes (19.7%) had poor vision five days after surgery with only four eyes (5.6%) having vision less than 6/60 six weeks after surgery. Table 2 gives the postop visual acuities after surgery, without spectacle correction at five days and six weeks.

Causes of poor outcome

Records of eyes with poor outcome were reviewed to find out reasons for poor outcome. Four eyes had poor outcome; two eyes had macular scar, one eye had myopic degeneration while one eye had no documented reason for the poor outcome.

Table 1: **Complications of small incision cataract surgery**

Complication	Number of eyes	%
Intraoperative		
Premature entry into anterior chamber	2	18.2
Posterior capsule rupture	3	27.3
Postoperative		
Hyphaema	2	18.2
Striae	4	36.4
Total	**11**	**100**

Table 2: **Visual outcome of small incision cataract surgery**

Visual	5 days postop		6 weeks postop	
Category	Number of	%	Number of	%
6/6 6/18 (good)	31	43.7	49	69.0
<6/18 6/60 (borderline)	26	36.6	18	25.4
< 6/60 (Poor)	14	19.7	4	5.6
Total	**71**	**100**	**71**	**100**

DISCUSSION

The main finding of this study is the fast rate of visual recovery following SICS with close to half of the patients having uncorrected visual acuity of 6/18 or better five days after surgery. Other studies have reported better outcomes at discharge but their patients had biometry to determine the power of intraocular lens inserted.[3] This study compares with other studies at six weeks after surgery.[3,6] The World Health Organisation (WHO) recommends cataract surgeons aim at achieving visual outcome with available correction in post cataract patients of at least 80% with good visual acuity (=6/18), 15% with borderline vision (<6/18-6/60) and less than 5% with poor outcome (<6/60).[8] Six weeks after surgery, close to the recommended 80% by the WHO had achieved good vision but the percentage of patients in the poor outcome category was more than the WHO cut off point. A number of other studies have also been unable to achieve 80% good visual outcome without correction six weeks after surgery.[3,] Other authors[3] have achieved over 90% good outcome and less than 5% poor outcome after spectacle correction as recommended by WHO, while others have achieved close to the recommended 90% with correction.[6] The proportion of eyes with good vision after sutured ECCE and without correction has been shown to be lower in a number of studies.[3] In this study, lack of facilities for biometry could explain the large proportion of our patients with borderline outcome. The use of biometry could reduce the proportion of eyes requiring spectacle correction to attain good vision. Results of outcome with spectacle correction would have been desirable but most of our patients do not turn up for refraction or refuse to wear their spectacle correction.[10,] This analysis of presenting visual acuity provides us with the most likely vision of our patients after cataract surgery in the community. However, there is a need for biometry to reduce the proportion of patients requiring spectacles for good vision.

The proportion of eyes that had capsule rupture is considered high, this occurred during attempts at delivering the nucleus as has been reported by other authors.[6] This is recognised as one of the difficult steps of this surgery. However, there was no vitreous loss as the self-sealing wound helped maintained the anterior chamber and contained vitreous loss.[6] Another complication encountered with this surgery was premature entry into the anterior chamber; these problems became less as the surgeon performed more surgeries. The presence of hyphaema was another common complication that was not peculiar to this study as hyphaema is a recognised complication of sutureless ECCE that is due to bleeding from the tunnel, the anterior chamber angle or iris vessels.[3,]

Patient comfort was better as the problems of suture irritation and need for suture removal is circumvented. These translate into less number of patient visits and reduced cost to both the patient and the hospital. Currently, the cost of obtaining the crescent knife, keratome and 15° blade; the additional instruments required for this procedure for a single unit of surgery is US $2.5 as against the $4.5 paid for a single unit of suture. This procedure has further reduced the cost per unit of surgery since sutures were not applied thus making the procedure cheaper.

The experience of the surgeon was that SICS was a more difficult procedure to learn than sutured ECCE.

CONCLUSION

Small incision cataract surgery is difficult to learn but a cost saving procedure with better patient comfort and faster visual recovery. It has great prospects for increasing the uptake of cataract surgery where phacoemulsification is not affordable.

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