

Original Article

A Cataract Surgery in A Camp Patient; A Study on Visual Outcomes

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ABSTRACT

Cataract is the leading cause of blindness and visual impairment among cataract patient globally including in Libya. Phacoemulsification is a commonly performed procedure to improve visual outcome among senile cataract patients because of its advantages compared to other techniques. This study was aimed to determine visual outcome improvement after phacoemulsification among cataract patient. A descriptive study was carried out among cataract patients who underwent phacoemulsification procedure. A total number of 100 operated eyes were followed-up to obtain their postoperative visual acuity (VA) and complications. There were significant improvements of VA resulting in an increase in the number of patients with good vision (normal to mild visual impairment) to 86% after phacoemulsification procedure. There was also low rate of postoperative complications. High quality cataract surgery with a low rate of intra-operative complications and good visual outcome can be attained in camp patients operated in the base hospitals, thus justifying more similar screening camps to clear the vast cataract backlog.

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INTRODUCTION

Cataract and refractive errors are two major public health problems in the context of ocular health in developing countries like Libya. Cataract is the most common cause of blindness (62.4%) followed by uncorrected refractive error (16.65%). Of this total burden of blindness more than eighty five percent of them are preventable if appropriate eye care services are provided [1].

However, the issued and concerned of the health care planners & professionals are that a considerable proportion of these visually challenged population are concentrated in rural, underserved area where public health services are not effectively functioning. This attributes a huge barrier in making efforts to achieve the goal of National Program for Control of Blindness (NPCB) i.e., reduction of the prevalence of avoidable blindness from 1.4% to 0.3% by 2020 [2]. In order to deal this hard-to-reach area, NPCB encourages to adopt two different strategies under the term 'Reach Out' and 'Reach In' outreach eye camp. Reach out is a makeshift surgical camp and was adopted at the initial period of program in which the team usually stays at the camp site for a few days and conducted the surgical procedure during the camp. Later, this makeshift camp strategy was withdrawn from the programme due to certain issues like impossible to move phaco equipment along with its support system to a remote location and complications reported in NPCB National Survey [3].

Currently, the NPCB encourages to adopt an outreach eye camp model in which camps were organized at the remote & rural area, and patients were transported to the base hospital for surgical interventions. So, in this approach, patients get all necessary precautions and care like routine hospital patients [4].

Despite efforts at reducing cataract, it is increasing at 4–6 million new cases per year. Cataract surgical outreach has been found useful in increasing surgical output with the hope that each operated case will restore vision. However, cataract surgery outcome may not be as good as expected, hence the need for adequate attention to it. Studies in Nepal, China, and India revealed 40–75% cataract surgery outcomes were worse than 6/18 in the operated eye with 21–53% having VA of <6/60. In Sub-Sahara Africa, poor outcome with VA less than 6/60 after cataract surgery often comprises 20% or more in published case series [5].

The general recommendation about cataract surgery is that it is indicated when cataracts interfere with daily activities or lifestyle. Assessment of visual function is a necessity when deciding for surgery. There are limited data in the literature to assess the change in visual acuity in eyes with good visual acuity before cataract surgery and the related factors that could possibly affect the outcomes. A study in the Chinese population reported that even patients with good preoperative visual acuity benefit from early cataract surgery. Moreover, potential visual acuity tests and objective measures of cataract progression (such as stray light measurement and Scheimpflug photography) have limited predictive value and clinical use [6]. This study aimed to evaluate the visual outcome and attainment of refractive aim after phacoemulsification between September and November 2023 and identify causes of poor outcome while suggesting ways to improve visual outcome.

METHODS

Study design

This retrospective study was conducted at the Ophthalmology Department. The study was approved by the Institutional Ethics Review Board. About 100 patients who were screened at the community-based camps and then transported to the base hospital, for the complete ophthalmic examination and cataract surgery were included in the study.

Data collection

A total of 100 eyes of 100 patients were consecutively operated by phacoemulsification cataract surgery. All patients provided written informed consent to participate. Patients with all types of senile cataract were included and for phacoemulsification, patients having immature cataract (Grade 1, 2 and 3) were included. One eyed patient, patients with subluxated lens, corneal dystrophies, corneal opacities, shallow anterior chamber, pre-existing ocular surgery, uveitis and patients having both cataract and glaucoma were excluded from study.

We reviewed the patient's pre-operative clinic assessment, operative notes, and post-operative clinic visits. Each included patient had a pre-operative assessment visit, where visual acuity The visual outcomes (best-corrected) were categorized according to the WHO classification: good 6/6 – 6/18, borderline < 6/18 – 6/60 and poor < 6/60., refraction, anterior segment, and fundus exams were performed. Phacoemulsification surgery details obtained from each case's operative note are detailed in the next section. Post-operatively, our institution's standard regimen includes eye patching until the next day's morning visit and movement restrictions for 3 days post-operatively. The next day, the eye patch was removed, and the eyes were examined, including visual acuity, wound leak, and intraocular pressure, along with an anterior segment exam. Prophylactic topical antibiotic drops (ciprofloxacin eye drops) 4 hourly and a single dose oral antibiotic (tablet ciprofloxacin 500 mg) were given one night prior to surgery.

Postoperatively all patients received oral antibiotics. Topical antibiotic steroid eye drops for 6 weeks in tapering dose along with flurbiprofen eye drops 8 hourly for 3 weeks. Follow up visits were scheduled for the 1st day, 1st week, 6th week, 3rd month, and 6th month postoperatively. At each visit, slit lamp examination, IOP measurement using Perkins tonometer, and fundus findings were recorded, in addition to visual acuity and refraction. Spectacle correction was given at the end of 6th week.

The visual outcomes (best-corrected) were categorized according to the WHO classification: good 6/6 – 6/18, borderline < 6/18 – 6/60 and poor < 6/60 [7]. The first post operative day (POD) complications were graded according to the OCTET (Oxford Cataract Treatment and Evaluation Team) definitions: Grade I- trivial complications that may have needed medical therapy but were not likely to result in marked drop in visual acuity; Grade II - intermediate complications that needed medical therapy, and would have resulted in marked drop in visual acuity if left untreated; Grade III - serious complications that would have needed immediate medical or surgical intervention to prevent gross visual loss.

Phacoemulsification surgery

All patients signed informed consent before entering the theater room. The eye undergoing surgery was marked, and dilating eye drops were applied 15 min before surgery. Intraoperatively, patients underwent topical, retrobulbar, or general anesthesia, depending on the patient's factors. Each operator had an operative technique for dividing the nucleus and cortex aspiration. Stop and chop was the most commonly used technique. Otherwise, other steps were usually performed according to a standard protocol. The standard protocol intraoperatively after draping and scrubbing included paracentesis creation, injection of intracameral adrenaline and lidocaine, the use of trypan blue dye, cohesive viscoelastic to form the anterior chamber, standard up to 3 mm superior limbal clear corneal incision, capsulorhexis creation, nucleus division, aspiration, and cortex aspiration according to the surgeon's training and preference, acrylic single-piece monofocal intraocular lens (IOL) injection in most patients, viscoelastic aspiration, wound hydration, followed by subconjunctival moxifloxacin and steroid injection. No intracameral antibiotic is usually given per our institutional protocol.

Statistical analysis

The collected data was revised, coded, and tabulated using Statistical package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. Mean, standard deviation (\pm SD), median, and range were used for numerical data. Frequency and percentage were used for non-numerical data. Student T Test was used to assess the statistical significance of the difference between two study group means. Chi-Square test was used to examine the relationship between two qualitative variables. p value is considered significant if <0.05 at confidence interval 95%.

RESULTS

The study was carried out on 100 eyes of 100 patients with white cataract whose ages ranged from 51 to 75 years underwent phacoemulsification. The mean age of the patients was 61 ± 7.45 , this group included 50 males and 50 females. Medical history: 21 patients (21%) were diabetic, 19 patients (19%) were hypertensive and 8 patients (8%) were diabetic and hypertensive (Table 1).

Table 1. Distribution of studied cases according to demographic data (n=100).

Variables	N=100
Age (Mean \pm SD)	61 \pm 7.45
Gender	
Male	50 (50%)
Female	50 (50%)
Medical history	
HTN	19 (19%)
DM	21 (21%)
HTN+DM	8 (8%)

In this study, (55%) had nuclear cataract, 25% had cortical cataract and 20% had posterior cataract. Of the total eyes, 49 % were right and 51% were left (Table 2). The level visual acuity (VA) showed statistically significant improvement in post-operative follow up ($p < 0.001$) (Table 3). There was only one case showed postoperative complication (Table 4).

Table 2. Distribution of studied cases according to type of cataract (n=100).

Type of cataract	N=100
Nuclear cataract	55 (55%)
Cortical cataract	25 (25%)
Posterior cataract	20 (20%)
Laterality	
Right	49 (49%)
Left	51 (51%)

Table 3. Visual acuity of eyes assessed before and after cataract surgery (n = 100).

Level of VA	Before surgery	After surgery	Test	P-value
	No. (%)	No. (%)		
6/6 – 6/18 (Good)	42 (42%)	86 (86%)	8.365	0.001*
< 6/18 – 6/60 (Borderline)	46 (46%)	13 (13%)		
< 6/60 (Poor)	12 (2%)	1 (1%)		

Table 4. Distribution of studied cases according to postoperative complications (n=100).

Postoperative complications	N=100
Yes	1 (1%)
No	99(99%)

DISCUSSION

Phacoemulsification is one of the procedure options for cataract patient, which is highly effective and efficient. Phacoemulsification has many advantages because this procedure requires only a small incision, which can control the anterior chamber to keep intraocular pressure within normal limits and prevent expulsive or suprachoroidal hemorrhage. This small incision also has a lower risk of developing astigmatism, so it also enables more rapid improvement on the patient vision compared to the large incision. Smaller incisions require less sutures, or even without sutures and require less rehabilitation time than larger incisions [8]. Successful cataract surgery universally improves the patient vision and quality of life. The emerging cataract surgery with phacoemulsification technique allows lens extraction with smaller incision. It also does not require stitches, which results in faster healing process [9].

In our study we found that the level visual acuity (VA) showed statistically significant improvement in post-operative follow up ($p < 0.001$). Our results were supported by Hashmi et al. [10] who showed that visual outcome in most of the operated eyes was good. Only around 7% of operated eyes had borderline or poor visual outcomes, the cause of which was mainly pre-existing ophthalmic comorbidities such as diabetic retinopathy, glaucoma and macular disease. Also, Satwika et al. [11] found that there are significant improvement of VA resulting in the decrease of blind patients to 0.0% and increase in the number of patients with good vision (normal to mild visual impairment) to 85.2% after phacoemulsification procedure. There was also low rate of postoperative complications. Therefore, phacoemulsification procedure should be continually considered and performed as a treatment option in treating senile cataract patients. These results are better than those of a recently conducted multi-country study which showed that 77% to 87% of the operated eyes in three developing countries achieved good outcome after correction. Refractive errors, pre-operative comorbidities and surgical complications were the reasons for poor or borderline outcomes [12].

In a study conducted at LRBT, Lahore, Pakistan, out of a total of 176 eyes that underwent cataract surgery, 69.9% had good visual outcome after correction, while 17.6% had borderline and 12.5% had poor outcomes. ECCE was performed in majority of the cases. Only 22% of the patients underwent phacoemulsification with IOL insertion [13]. Another hospital-based study conducted in Karachi, achieved good visual outcome in 97.2% of the operated eyes. However, the study had a very high (57.2%) lost to follow-up rate [14].

Previous study in Pakistan, Thailand, Nigeria, and India also observes the significant improvement on the visual outcome after phacoemulsification surgery. In Pakistan, from 842 operated eyes, initially 2% had good of 6/6 -6/18, around 12% had satisfactory VA of 6/24 -6/60, and more than 80% had poor VA of <6/60. After the surgery, number of eyes with good VA increase to 39%, while the eyes exhibit poor VA decrease to 20% [15]. In Thailand, similar study also observes the improvement of the VA post phacoemulsification surgery, whereby VA of less than 6/60 are reduced from 36.15% to 2.28%, while VA of >6/18 from only 2.36% to 83.6% in a month after surgery [16]. In Nigeria, phacoemulsification procedure was able to reduce the number of eyes with VA of <6/60 from 35.7% to 4.5% and increases eyes with VA of >6/18 from 38.2% to 85.4%. Moreover, based on BCVA, 94.7% of eyes had BCVA of 6/12 or better 3 months after the surgery [17]. Another study in India, also shows 58.1% improvement on total eyes with good VA of 6/6-6/18, and further improvement of 29.9% upon correction 4 weeks after the surgery [18].

Good visual outcome is essential both from the perspective of visual function and patient's satisfaction. In order to achieve good results, it is important that surgeons and eye care centres audit their performance regularly. Phacoemulsification with IOL insertion was the procedure performed on nearly all the eyes that were operated upon in our centre. In our region as well as in other developing countries, many centres still do not routinely use this procedure. Population studies from developing countries reveal that majority of the operated eyes do not achieve the WHO recommended levels of visual outcomes [9].

Our results illustrated that there was only one case showed postoperative complication. A recent publication by Ti et al. [19] analyzing the rate of postoperative complications after phacoemulsification in a tertiary hospital in Singapore, also found an overall rate of 1.8%, which is comparable. Moreover, Dervenis et al. [20] found that postoperative complications after phacoemulsification in their population was 22 eyes (0.8%).

Strength and limitations

The strength of this study is a relatively large sample size, routine use of modern surgical technique (phacoemulsification) with IOL implantation, and surgeon's expertise. A limitation of our study was the relatively short follow-up duration might be another limitation, and extended follow-up might have clarified more post-surgical complications including posterior capsule opacity and lens dislocation. In addition, VA was the outcome measures in our study; however, other outcome measures, including contrast sensitivity and quality of life, also would be important for future studies.

CONCLUSION

In conclusion, this study shows good visual outcome of cataract surgeries performed using phacoemulsification. High quality cataract surgery with a low rate of intra-operative complications and good visual outcome can be attained in camp patients operated in the base hospitals, thus justifying more similar screening camps to clear the vast cataract backlog.

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Conflicts of Interest

The authors declare no conflicts of interest.

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جراحة إعتام عدسة العين في مرضى المخيمات ؛ دراسة حول النتائج البصرية

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المستخلص

إعتام عدسة العين والأخطاء الانكسارية هما مشكلتان رئيسيتان في سياق صحة العين في البلدان النامية مثل ليبيا. إعتام عدسة العين هو السبب الأكثر شيوعاً للعمى (62.4%) يليه الخطأ الانكساري غير المصحح (16.65%). من هذا العبء الكلي للعمى، يمكن الوقاية من أكثر من خمسة وثمانين بالمائة منها إذا تم توفير خدمات العناية بالعيون المناسبة. ومع ذلك فإن ما يقلق مخططي الرعاية الصحية والمهنيين هو أن نسبة كبيرة من هؤلاء السكان المعاقين بصريا يتركزون في المناطق الريفية المحرومة من الخدمات حيث لا تعمل خدمات الصحة العامة بشكل فعال. ومع ذلك، قد لا تكون نتائج جراحة الساد جيدة كما هو متوقع، ومن هنا تأتي الحاجة إلى الاهتمام الكافي بها. هدفت هذه الدراسة إلى تقييم النتيجة البصرية وتحقيق الهدف الانكساري بعد استحلاب العدسة بين سبتمبر ونوفمبر 2023 وتحديد أسباب النتائج السيئة مع اقتراح طرق لتحسين النتيجة البصرية. تم تضمين 100 مريض تم فحصهم في المخيمات المجتمعية ثم نقلوا إلى المستشفى الأساسي، لإجراء فحص العيون الكامل وجراحة الساد في الدراسة. تم إجراء ما مجموعه 100 عين من 100 مريض على التوالي عن طريق جراحة إعتام عدسة العين استحلاب العدسة. قدم جميع المرضى موافقة خطية مستنيرة للمشاركة. قمنا بمراجعة تقييم عيادة المريض قبل الجراحة، والملاحظات الجراحية، وزيارات العيادة بعد الجراحة. كان لكل مريض مشمول زيارة تقييم قبل الجراحة، حيث تم تصنيف النتائج البصرية وفقاً لتصنيف منظمة الصحة العالمية: جيد 6/6 - 18/6، > حدودي 18/6 - 60/6 وضعيف > 60/6. تفاصيل جراحة استحلاب العدسة تم الحصول عليها من الملاحظة الجراحية لكل حالة مفصلة في القسم. تم جدولة زيارة المرضى بعد الجراحة. في كل زيارة، تم تسجيل فحص المصباح الشقي، وقياس ضغط العين، ونتائج قاع العين، بالإضافة إلى حدة البصر والانكسار. كان متوسط عمر المرضى 61 ± 7.45، وضمت هذه المجموعة 50 ذكراً و 50 أنثى. التاريخ الطبي: كان 21 مريضاً (21%) مصابين بالسكري، و 19 مريضاً (19%) يعانون من ارتفاع ضغط الدم و 8 مرضى (8%) يعانون من مرض السكري وارتفاع ضغط الدم. في هذه الدراسة، كان (55%) يعانون من إعتام عدسة العين النووي، و 2% يعانون من إعتام عدسة العين القشري و 20% لديهم إعتام عدسة العين الخلفي. من مجموع العيون، كان 49% يميناً و 51% يساراً. أظهر مستوى حدة البصر (VA) تحسناً ذا دلالة إحصائية في متابعة ما بعد الجراحة ($p < 0.001$)، من بين ما مجموعه 100 عيناً خضعت لجراحة إعتام عدسة العين، كان لدى 86% نتائج بصرية جيدة بعد التصحيح، بينما كان لدى 13% خط حدودي و 12% كانت نتائجها سيئة. كانت هناك حالة واحدة فقط أظهرت مضاعفات ما بعد الجراحة.

الكلمات الدالة. طب العيون، استحلاب العدسة، إعتام عدسة العين، حدة البصر.