The Kuwait Cataract Outcome Study: A 12-Month Evaluation

S. Abdelmoaty A.M. Behbehani A. Aljazzaf N. Grigis E. Eslah T. Marouf
S. Almuteri Y. Alzafiri

Al-Bahar Eye Center, Ministry of Health, and Department of Surgery, Faculty of Medicine, Kuwait University,
Kuwait

Key Words

Cataract extraction · Extracapsular cataract extraction ·
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Abstract

Objective: To assess the frequency of intraoperative difficulties, postoperative complications and the visual outcome in cataract surgery performed at the Al-Bahar Eye Center, Kuwait. **Subjects and Methods:** This case series study is comprised of 350 eyes from 325 subjects (169 male, 156 female; 30–78 years, mean age 64 years) undergoing consecutive cataract surgery performed at the Al-Bahar Eye Center, Kuwait from July 2001 to June 2002. All the eyes underwent extensive ophthalmic examinations before and after surgery. Details of surgical procedures, including the type of the cataract surgery, intraoperative difficulties or complications, postoperative complications, and the visual outcome were documented. **Results:** The extracapsular cataract extraction (ECCE) technique was used for 50.2% of the eyes and for the remaining 49.8%, the small-incision phacoemulsification technique was used. Of the 350 eyes operated upon, 9.7% had coexisting ocular disease which may have affected the best spectacle corrected visual acuity (BSCVA). Complications included posterior capsule tears and vitreous loss (10%), cystoid macular edema (0.6%)

and endophthalmitis (0.9%) of the eyes. A BSCVA of 6/12 or better was achieved in 78.3% of the cases. **Conclusion:** A high success rate in terms of visual acuity outcome was achieved in the cataract surgery. The operative and postoperative complications were similar for both techniques, ECCE and phacoemulsification.

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Introduction

Cataract is the leading cause of blindness worldwide. For these patients, the extent of reduction in visual acuity is such that the quality of life is affected negatively and requires cataract surgery. Symptoms including glare, reading difficulty, disruption in visual function and activities of daily living determine the decision to operate. Consequently, cataract extraction accounts for the majority of all ophthalmic procedures [1–6]. During the last three decades, cataract surgery has evolved from intracapsular cataract extraction and anterior chamber intraocular lens (AC IOL) to extracapsular cataract extraction (ECCE) and posterior chamber intraocular lens (PC IOL). Recently, phacoemulsification and the use of foldable intraocular lens (IOL) have become the procedure of choice.

Recent advances in surgical techniques and the design of IOL have enabled cataract surgery to evolve into an outpatient procedure involving small-incision and sutureless phacoemulsification with foldable lens implantation under local anesthesia. This study is an analysis of cataract outcome performed in Kuwait.

Subjects and Methods

Medical records of 325 patients who underwent cataract surgery during a 1-year period from July 2001 to June 2002 were reviewed. All the surgeries were performed by a unit group of 8 surgeons within the Al-Bahar Eye Center, Kuwait; the only specialized eye center in the country. Each surgeon selected a technique most suitable for each case. Cases of congenital and traumatic cataract were excluded. Twenty-five patients were operated on both eyes during the study period, hence the total number of operated eyes was 350. The following variables were documented: age, gender, cataract-related symptoms, indication of surgery, visual acuity as Snellen's fraction values, as well as the incidence of coexisting potentially vision-threatening ocular pathology. General medical problems such as diabetes mellitus (DM), hypertension (HT), and ischemic heart disease (IHD) were also recorded. Operative data constituted the type of surgery (ECCE or phacoemulsification), the type of IOL implant (rigid or foldable) and perioperative complications. At the last follow-up visit, best corrected visual acuity and any ocular complications related to the surgery were documented. Reduced visual acuity was the commonest presenting symptom, reported for 340 eyes. Phacomorphic glaucoma was the indication of surgery for 7 eyes and significant glare for 3 eyes. Visual acuity at the time of surgery ranged from 20/25 to light perception (table 1).

Results

Of the 325 patients, 182 (52%) were male and 168 (48%) were female, with a mean age $\pm$ SD of 64 ± 28.5 years, range 30–70 years (table 2). Three hundred subjects underwent one eye operation while 25 were operated on both eyes. The commonest etiology was senility ($n = 337$, 96.5%) and the remaining were uveitic ($n = 8$, 2%); steroid induced ($n = 2$, 0.5%), and idiopathic ($n = 3$, 1%). Coexisting eye diseases that could potentially affect visual outcome were present in 34 eyes (9.7%) that included opaque cornea ($n = 15$, 4.2%); glaucoma ($n = 10$, 2.8%); diabetic retinopathy ($n = 5$, 1.4%); age-related macular degeneration ($n = 2$, 0.57%), and optic atrophy ($n = 2$, 0.57%). The following systemic diseases were noted in 170 patients (49%): DM (35%), HT (34%), and IHD (15%). The remaining 30 patients (9%) presented with other systemic diseases (table 3).

Table 1. Preoperative visual acuity

Visual acuity	Male	Female	Total
$\leq 6/9-6/18$	16	14	30
$>6/18-6/24$	24	20	44
$>6/24-6/60$	47	41	88
Counting fingers	40	33	73
Hand motion	41	40	81
Perception of light	14	20	34

Table 2. Age and sex frequency

Age	Males	Females	Total
30–39	7	6	13
40–49	15	13	28
50–59	36	30	66
60–69	75	71	146
70–87	49	48	97

Table 3. Prevalence of coexisting systemic diseases

Systemic diseases	n	%
DM alone	37	11
HT alone	30	9
IHD alone	9	3
DM and HT	53	15
DM and IHD	6	2
HT and IHD	9	3
DM, HT and IHD	26	7
Others	30	9

ECCE was performed in 176 (50.2%) eyes and phacoemulsification in 174 (49.8%). Foldable IOLs were implanted in 165 (47%) eyes, rigid (PMMA) PC IOLs in 165 (47%) eyes and AC IOLs in 20 (6%) eyes.

The operative complications are listed in table 4. The commonest complications were posterior capsule tears and vitreous loss ($n = 35$); corneal edema ($n = 20$); residual cortex ($n = 16$) and intraocular pressure >30 mm Hg ($n = 24$). The complication of posterior capsule tears and vitreous loss was responsible for AC IOL implant in 20 eyes. Residual cortex was treated medically except for one case that required surgical anterior chamber washout. The corneal decompensation complication required a penetrating keratoplasty in 2 eyes. Wound dehiscence

Table 4. Postoperative complications

Parameter	Total	PHACO	ECCE
Posterior capsule tear and vitreous loss	35 (10)	21 (12.06)	14 (7.95)
Wound leak	2 (0.57)	1 (0.57)	1 (0.56)
Wound dehiscence	4 (1.14)	1 (0.57)	3 (1.70)
Tight suture	3 (0.85)	1 (0.57)	2 (1.13)
Corneal edema	20 (5.71)	14 (8.04)	6 (3.40)
Corneal decompensation	2 (0.57)	1 (0.57)	1 (0.56)
Residual cortex	16 (4.57)	6 (3.44)	10 (5.68)
Dislocated IOL	3 (0.85)	2 (1.14)	1 (0.65)
Dropped IOL	2 (0.57)	0.0000	2 (1.13)
IOP >30 mm Hg	24 (6.85)	10 (5.74)	14 (7.95)
Distorted pupil	9 (2.57)	5 (2.87)	4 (2.27)
Posterior capsule opacification	13 (3.7)	11 (6.32)	12 (6.8)
Endophthalmitis	3 (0.85)	3 (1.72)	0.000
Cystoid macular edema	2 (0.57)	1 (0.57)	1 (0.56)

Figures in parentheses indicate percentages. PHACO = Phacoemulsification; IOP = intraocular pressure.

with iris prolapse was managed surgically by iris repositioning and wound suturing. Other complications were managed medically or surgically. It is worth pointing out that 3 eyes developed endophthalmitis after phacoemulsification. One eye responded to pars plana vitrectomy and intravitreal injection of antibiotics and attained a final best spectacle corrected visual acuity (BSCVA) of 20/300. Unfortunately, the other 2 ended up by evisceration. AC and vitreous tap culture and sensitivity grew aerobic Gram-positive bacilli in 1 case but in the other 2 cases no growth was observed.

Posterior capsule opacification, a common late postoperative complication, occurred in 23 eyes (6.8%); 11 eyes with phacoemulsification and 12 eyes with ECCE; all required Nd:YAG (neodymium:yttrium-aluminium-garnet) laser capsulotomy. Another late postoperative complication was persistent cystoid macular edema, seen in only 2 cases.

The BSCVA values were available in only 322 (96.4%) eyes; 164 eyes following phacoemulsification and 158 eyes after ECCE. It was 6/12 or better in 252 eyes; 140 eyes after phacoemulsification and 112 eyes after ECCE (table 5). Twenty-nine and fifteen percent of eyes demonstrated a BSCVA of 6/6 after phacoemulsification and ECCE, respectively. A vision of 6/12 or better was also achieved in 61% of eyes with ocular comorbidity; however, after excluding these eyes from the analysis, 87% of the cases had a BSCVA of 6/12 or better. Of the 350 eyes, only 16 (4.6%) were lost to follow-up, whereas the remaining 334 (95.4%) eyes were followed up for 3–9 months (mean $\pm$ SD 6 $\pm$ 3).

Table 5. BSCVA 4 weeks postoperatively

BSCVA	PHACO	ECCE	Total
$\geq 6/12$	140 (85.36)	112 (70.88)	252 (78.3)
<6/12–6/60	18 (10.97)	39 (24.68)	57 (17.7)
<6/60	6 (3.65)	7 (4.43)	13 (4)

p = 0.004 (using χ^2 method). Figures in parentheses indicate percentages. PHACO = Phacoemulsification.

Discussion

This case series study represents typical subjects presenting with cataract and subsequent management in the public health service within Kuwait. It confirms that the population undergoing cataract surgery in Kuwait is predominantly elderly (table 2) with a few subjects having uveitic, drug-induced and idiopathic cataracts. Previous studies in various countries have demonstrated increased prevalence of cataract among women [1–7]. However, in our study, the number of females operated upon was marginally lower than males (table 2), probably because a majority of this cohort was elderly, mostly housebound and has little education and may not seek help frequently despite the availability of equal access to health care.

Although visual acuity and its improvement by refraction are reported in this study, other measures such as functional acuity, symptom score, and patient's satisfaction are also valuable measures for providing a compre-

hensive assessment of cataract surgery outcome [8, 9]. However, the postoperative BSCVA in the operated eye is the single most important outcome factor in terms of patient satisfaction [10]. In this study, 78.3% of all eyes had a postoperative final BSCVA of 6/12 or better. Better vision was achieved with phacoemulsification (85%) than ECCE (71%), similar to other studies [11–14]. The difference was statistically significant ($p = 0.004$, table 5). However, Schein et al. [15] did not find a significant difference in visual outcome between phacoemulsification and ECCE.

A possible explanation for poorer visual outcomes after ECCE surgery in our series could be due to the tendency of individual surgeons to select eyes with advanced nuclear sclerosis, poorly dilatable pupils and corneal opacities to undergo the ECCE technique rather than phacoemulsification.

In this study, perioperative complications of capsular rupture and vitreous loss (10% of all cases and 12% of phacoemulsification cases) are of concern to us because they are higher than previously published ones that range from 1.95% (1.7% for phacoemulsification and 2.5% for ECCE) to 4.4% (4.3% for phacoemulsification and 4.8% for ECCE) in the UK [12, 13, 15, 16]. The high rate of posterior capsular rupture and vitreous loss could be due to our recent transition from ECCE to phacoemulsification as well as to the relatively advanced age of the cataract population cohort. At any rate, the 12% complications of phacoemulsification cases obtained in this study is similar to the rate (9.9%) reported by Cruz et al. [17].

The sample size of the cohort did not allow a meaningful comparison of rates of individual rare postoperative complications when surgery was performed via phacoemulsification versus ECCE. Also, rates of relatively frequent complications did not have a significant difference ($p = 0.4$).

The rates of complications of corneal edema and raised postoperative intraocular pressure were within the ranges of previous reports [10, 13]. However, a high total rate of residual cortex of 4.6% was obtained compared to the 0.6 and 1.1% reported by Schein et al. [15] and Desai et al. [13], respectively. This could be attributed to overcautiousness of the surgeons, wanting to limit the possibility of posterior capsular rupture during total cortex cleaning. Although the incidence of endophthalmitis (0.9%) seems to be relatively high in this cohort, we are aware that it does not represent the actual total rate of endophthalmitis related to cataract surgery done by all units at our center.

YAG capsulotomy done for 6.8% of our cases to treat posterior capsular opacification is within the reported range of 0.4–19% [10, 11, 13]. This wide variation may have the underlying difficulty in not having a standard guideline, stating the degree of posterior capsular opacification that would warrant treatment.

Phacoemulsification is a technically more complex and expensive operation compared to planned ECCE, but the recent advantage of having foldable IOLs permits insertion through a small wound. In this study, 49.8% of cataract surgery were by phacoemulsification in which foldable IOLs were used in 95%, similar to a report from the American Society of Cataract and Refractive Surgery [11], a multicenter study involving 13 European countries [12] and the UK national cataract surgery survey of 1997–1998 [13]. Thus, we recommend a switch to the phacoemulsification technique, favored by most surgeons in Europe and America.

Conclusion

This study confirms that our center utilizes contemporary surgical techniques, particularly that employing small-incision phacoemulsification with insertion of foldable IOLs. With time, as experience cumulates, it is possible to achieve cataract surgery outcome rates comparable to those in the published literature.

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