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First day review after uncomplicated phacoemulsification: Is it necessary?

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PURPOSE. *To determine whether first day follow-up is necessary after routine uncomplicated phacoemulsification cataract surgery.*
METHODS. *Data collected prospectively at day 1 postoperative review.*
RESULTS. *In 510 consecutive cases, serious complications occurred in 8 (1.6%) (wound leak [4], corneal abrasion [2], iris prolapse [1], hyphema [1]). Intraocular pressure (IOP) >30 mmHg was found in 26 (5.1%) and was strongly associated with a diagnosis of pre-existing glaucoma or ocular hypertension (odds ratio [OR] 7.7). Symptoms of headache or ocular discomfort occurred in 40 (7.8%), mostly in association with raised IOP, and were also associated with pre-existing glaucoma or ocular hypertension (OR 4.7). Central corneal edema was found in 61 (12.0%). In the absence of corneal edema, IOP was >30 mmHg in only two cases (0.39%).*
CONCLUSIONS. *Few sight-threatening complications were detected on the morning after an uncomplicated procedure. First day follow-up may be safely omitted if adequate patient counseling is undertaken and there is provision of adequate access to eye services. Review prior to discharge on the day of surgery would provide an opportunity to detect these few surgical complications and for counseling. A diagnosis of glaucoma or ocular hypertension is a risk factor for significantly raised next day IOP and these patients are more likely to experience postoperative discomfort. They may benefit from prophylactic treatment. (Eur J Ophthalmol 2006; 16: 554-9)*

KEY WORDS. *Cataract surgery, Complications, Glaucoma, Ocular hypertension*

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INTRODUCTION

Increasing demand for cataract surgery is resulting in a greater emphasis on high volume day-case procedures. Postoperative review practice varies widely from center to center with little evidence-based consensus. Commonly, patients are examined on the day following surgery, necessitating a further hospital visit. With escalating pressures upon the health care system and the increasing workload placed upon health care professionals, there is much debate with regard to the need for this follow-up protocol.

This study aims to determine whether routine first day follow-up after uncomplicated phacoemulsification cataract surgery is necessary.

METHODS

In this prospective study, consecutive patients undergoing clear cornea phacoemulsification day-case cataract surgery over a 4-month period were recruited.

Patients undergoing any other form of cataract extraction and those having topical or general anesthesia were

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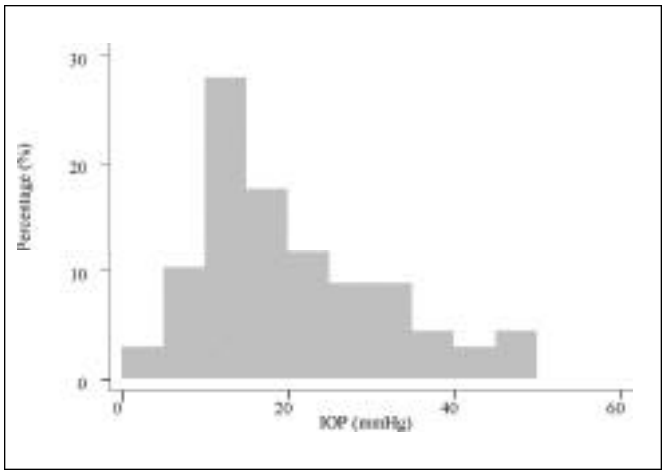

Fig. 1 - *First day postoperative intraocular pressure in glaucoma and ocular hypertension patients (n=68).*

excluded. Patients with glaucoma or ocular hypertension (OHT) were included. If any peroperative complications were encountered an ophthalmologist examined the patient on the following day and these patients were not included in the study.

The surgery was performed by four consultants and two trainees. Patients received preoperative mydriasis with guttae cyclopentolate 1% and guttae phenylephrine 2.5%. All patients had regional anesthesia with a sub-Tenon technique utilizing 5 mL of 2% lignocaine. None of the operating surgeons routinely utilize topical anesthesia. A superior or temporal clear corneal 2.5 mm incision was made and viscoelastic material was introduced into the anterior chamber. A continuous curvilinear capsulorhexis was made, the lens hydrodissected, and the nucleus was phacoemulsified by divide and conquer or phaco-chop techniques. Cortical remnants were removed by irrigation and aspiration and the incision was extended to 3.5 mm after introduction of further viscoelastic. A foldable intraocular lens was placed into the capsular bag. Viscoelastic was aspirated and the anterior chamber was reformed with balanced salt solution introduced via the paracentesis. Subconjunctival Betnesol (4 mg) and Cefuroxime (125 mg) was administered at the end of the procedure. A pad and eye shield was applied.

Our current standard follow-up practice is for patients to attend in the morning after the operation for examination by an ophthalmic nurse practitioner (ONP) after removal of the dressing and cleaning of the eye. Intraocular pressures (IOP) are routinely measured by Goldmann applanation tonometry. No routine antiocular hypertensive medication is given. Our standard cut-off point for the treatment of raised IOP is 30 mmHg. Any other complications noted are referred to an ophthalmologist for review and managed appropriately. If no complications are found then the patient is counseled with regards the topical medication required and general care of the operated eye. An outpatient appointment is made for approximately 1 month later.

Data were collected prospectively with regards to patients age and the presence of a diagnosis of OHT or glaucoma. Any complications encountered during the administration of the regional anesthetic block or directly attributable to the anesthetic were noted excluding subconjunctival hemorrhage. Patients were directly questioned about the presence of symptoms of headache and “pain in the eye” at the time of review. Central clarity of the cornea and IOP by Goldmann applanation tonometry were documented. Section related edema was ignored. The examiner noted whether any treatment was initiated for an IOP rise and whether any unexpected operative complications were encountered requiring referral to a clinician.

Routine follow-up practice is a 4-week outpatient appointment with refraction.

Information with regard to perioperative complications or anesthetic complications were obtained by scrutiny of the operation notes.

RESULTS

A total of 510 consecutive cases were recruited. Mean age of patients was 74.8 years (SD 10.1).

A diagnosis of glaucoma or ocular hypertension was present in 68 subjects (13.3%). Serious complications occurred in 6 cases (1.2%): wound leakage in 4, iris prolapse in 1, and hyphema in 1.

IOP was recorded in 507 cases at first day review. Mean first day IOP ± SD was 15.3 ± 7.7 mmHg. An IOP of greater than 30 mmHg was found in 26 (5.1%). This finding was strongly associated with a diagnosis of pre-existing glaucoma or ocular hypertension. IOP > 30 mmHg occurred in 19.1% (13/68) of subjects with glaucoma/ocular hypertension compared with only 3.0% (13/439) of those without (odds ratio [OR] = 7.7 [95% CI: 3.4 to 17.6]). Of the 26 cases of IOP > 30 mmHg, 13 (50%) occurred in those with glaucoma/ocular hypertension. Distributions of IOP among

glaucoma/OHT patients and non-glaucoma/non-OHT patients are illustrated in Figures 1 and 2.

Headache or ocular discomfort occurred in 40 (7.8%), mostly in association with raised IOP. In 18 of these (45.0%), IOP was > 30 mmHg at first day review. Symptoms were also related to the presence of pre-existing glaucoma or ocular hypertension, occurring in 22.1% (15/68) of those with either of these conditions compared to only 4.3% (25/442) of those without (OR = 4.7 [95% CI: 2.3 to 9.5]). Of the 15 glaucoma/OHT cases experiencing discomfort, 11 (73.7%) had an IOP > 30 mmHg.

Central corneal edema was found in 61 cases (12.0%). In the absence of corneal edema, IOP was greater than 30 mmHg in only two cases (0.39%). The predictive value of a clear central cornea excluding elevated IOP was, therefore, 99.6%.

No complications were noted in relation to the local anesthetic block.

In cases where the operation was routine with no operative complications, 8 unexpected complications were detected at first day review. Therefore, excluding elevated IOP, the complication rate was 1.6%. These complications were wound leakage (4), corneal abrasion (2), iris prolapse through the section (1), and small hyphema (1). Two wound leakages required suturing in theatre, whereas the remaining two settled with conservative management consisting of a short period of bandage contact lens use.

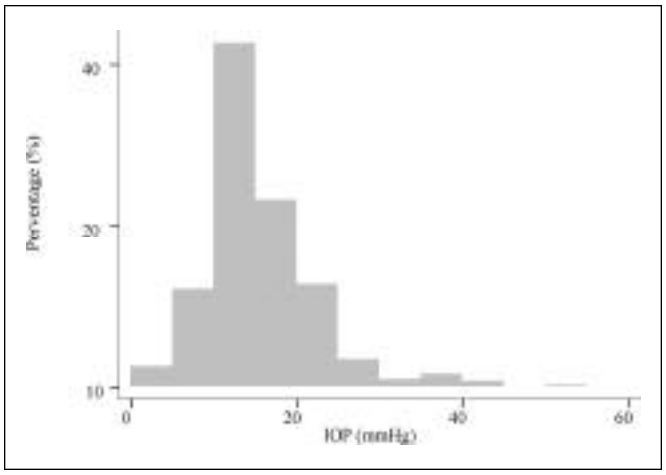

Fig. 2 - *First postoperative day intraocular pressure in non-glaucoma/non-ocular hypertension patients (n=439).*

DISCUSSION

There is a continuing trend toward day case cataract surgery, with patients going home a few hours after surgery and, in some centers, returning for review on the following day. This extra visit involves inconvenience to patients as well as an additional burden on the health service, and its necessity has been extensively questioned. In order to safely abandon first day follow-up it is essential that the clinician is certain that the rate of sight-threatening complications that may require intervention, and might otherwise go undetected, is very low.

To examine this issue, we collected data prospectively on a large number of subjects undergoing uncomplicated day case phacoemulsification cataract surgery. Potentially sight-threatening complications were found in eight patients (1.6%), of which the most common was wound leakage, occurring in four cases (0.8%). This complication may be self-limiting with eventual sealing of the wound; however, currently the natural history of early wound leakage is unknown. In each of these cases the patient was asymptomatic and this lack of symptoms might lead to a delay in diagnosis with subsequent potential for significant morbidity. One of these cases had an associated iris prolapse, which, although rare after small incision surgery, is a potentially serious complication requiring further surgical intervention (1, 2). No specific change in postoperative treatment was instigated for the remaining three complicated cases (two corneal abrasions and one hyphema), although follow-up visits were brought forward.

All patients involved in this study underwent local anesthetic blockade by a sub-Tenon technique. Subconjunctival hemorrhage after this technique is common and usually related to the initial incision through the conjunctiva. It is innocuous and usually resolves without intervention in the early postoperative period. No complications were encountered, supporting the view that it is an extremely safe technique of regional ocular anesthesia.

We found no cases of excessive uveitis in this cohort. Detection of endophthalmitis is unlikely on the first postoperative day as it is not usually apparent prior to 48 hours postoperatively, even when secondary to a virulent organism (3).

Our results broadly agree with previous work on this subject. Herbert et al (4) retrospectively reviewed findings at first day follow-up in 392 cases. They found 1 case of painless iris prolapse (0.26%), 7 cases of excessive postoperative uveitis (1.78%), and 11 corneal abrasions (2.81%). They concluded that potentially sight-threatening

complications present on the first postoperative day, albeit infrequently, and thus, in contrast to our view, recommended that such review remains. Tan et al (5) looked prospectively at 227 patients undergoing uncomplicated cataract surgery, finding a 5.7% incidence of complications with a 2.2% clinical intervention rate. Based on their data they concluded that first day review may safely be omitted.

Tufail and colleagues (6) looked prospectively at patients undergoing extracapsular cataract surgery, comparing true day-case surgery where patients were reviewed at 4 to 6 hours postoperatively to next day review and found that next day review did not increase the yield of detection of preventable complications.

A low intervention rate was found in a retrospective study carried out on 651 cases of uncomplicated phacoemulsification cataract extraction (7). In more than 95% of total follow-up appointments there was no clinical intervention whatsoever. They concluded that with improved patient education and provision of an open channel for self-referral routine follow-up practice might be safely changed.

In two smaller studies no sight-threatening complications were detected at first day follow-up and the only additional intervention was for raised IOP (8, 9).

In our study an IOP over 30 mmHg was found in 26 cases (5.1%). The early postoperative period following cataract surgery is known to be associated with a rise in IOP. Previous studies assessing the frequency of clinically significant elevation of IOP report raised IOP in 2.3 to 8.9% of cases with the peak at a level of between 3 and 9 mmHg above baseline at 6 to 8 hours postoperatively (7-14). The rise is usually a self-limiting phenomenon and well-tolerated by the majority of eyes (15). An extremely high or prolonged episode of ocular hypertension may be associated with pain, corneal edema, anterior ischemic optic neuropathy, or central retinal vein occlusion. Furthermore, progression of a glaucomatous field loss has been documented after cataract surgery in patients with pre-existing severe field defects (16).

Ahmed and colleagues (17) retrospectively assessed 465 patients having routine phacoemulsification surgery. They found that first postoperative day review was unnecessary with any potential complications detected at assessment on the day of surgery. Tranos et al (18) focused on IOP in the early postoperative period after uneventful phacoemulsification surgery, finding that moderate IOP spikes were not associated with any significant morbidity and tended to resolve spontaneously in normal eyes. They did recommend closer vigilance with day of surgery review in patients with compromised optic discs.

In this study, patients with a history of glaucoma or ocular hypertension were much more likely to incur a postoperative rise in IOP. This subgroup was at nearly eight times greater risk of an IOP of over 30 mmHg on the day following surgery. Of all patients reaching this IOP level, 50% had glaucoma or ocular hypertension. This finding supports recent work by Allan and coworkers (7), who studied patients on the first day after predominantly phacoemulsification cataract surgery. They found that 6.6% of their patients had glaucoma but, of the cases reaching their treatment threshold of 30 mmHg or greater, 18% had glaucoma. As these patients are also more susceptible to optic nerve head damage from raised IOP, it would appear prudent to consider this group of patients for prophylactic treatment to minimize the duration of any sustained pressure increase. Since the pressure peak occurs prior to the first day postoperative visit there seems little logic in reviewing patients at this late stage with regards to preventing any potential effects of raised IOP.

The need for prophylactic treatment is supported by the high prevalence of discomfort associated with the postoperative rise in IOP. Symptoms following the procedure are an important, but largely ignored consequence of cataract surgery. In this study 7.8% of patients reported headache and/or the presence of “pain in the eye” during the early postoperative period. In 45% of these, IOP was above 30 mmHg (compared to only 1.7% of those who were symptom-free). Had only patients experiencing discomfort been reviewed the following day then nearly 70% of cases of elevated IOP would have been detected. Symptoms were particularly frequent (22.1%) in those with glaucoma or OHT and in nearly three-quarters of those with IOP > 30 mmHg.

Assuming that the strong relationship between raised IOP and symptoms is a causal one, then effective IOP prophylaxis restricted to the glaucoma/OHT group would have reduced the incidence of discomfort in this group from 22.1% to 5.9% and the overall incidence of discomfort from 7.8% to 5.7%. This would be an additional and worthwhile benefit of prophylactic medication for postoperative IOP, at least in patients with glaucoma or OHT. Dorzolamide, latanoprost (19), beta-blockers (20), and systemic treatment with acetazolamide immediately pre or post surgery (21) have all been suggested for prophylaxis.

Central corneal clarity has been shown in our study to

be a relatively sensitive and specific indicator of the presence of raised IOP. In the absence of central corneal edema the IOP was above our treatment threshold in only 2 cases out of 446 (0.39%). In the presence of a clear cornea it appears unnecessary to check IOP in this context.

The primary function of the next day review is to detect the presence of surgical complications. We conclude that these occur at a rate that does not, by itself, justify first day follow-up. The large majority of these would be expected to be apparent on the day of surgery so that review at the slit-lamp before the patient leaves the unit would be a satisfactory compromise to detect complications without necessitating another patient visit. In light of our knowledge of the time course of the IOP rise following surgery, reviewing patients on the first day postop for the purpose of detecting significantly elevated pressure, as has been suggested (8), would appear to be unnecessary. Since peak IOP occurs much earlier, the period of greatest discomfort and risk of other potential pressure-related sequelae has already passed. There is an argument in favor of prophylaxis for this complication, at least in those with glaucoma or OHT who are especially at risk. Further study in the form of a randomised controlled trial would be required to assess whether the use of prophylactic antiocular hypertensives would indeed blunt the IOP spike associated with cataract surgery.

In addition to detection of complications there are other functions of the first day review. It provides an opportunity for reassuring patients, counseling them as regards appropriate postoperative care, and a method for monitoring surgical results as a learning/audit experience. All of these may be achieved by review before discharge on the day of surgery and final examination prior to discharge from the clinic.

This study has shown that after uncomplicated phacoemulsification cataract surgery first day review may safely be omitted thus minimizing inconvenience to patients and reducing health care costs, as well as facilitating an increased uptake of day case surgery. For patients with a complicated operative passage first day review remains prudent.

It is important that if first day follow-up is omitted there is in place adequate access to rapid eye care. The patient should be adequately counseled as regards the expected postoperative course, should be given a realistic expectation for visual outcome, and should be confident he or she has free rapid access for review should symptoms of concern develop.

No authors have any proprietary interest.

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