

Phacoemulsification cataract surgery and unplanned anterior vitrectomy—is it bad news?

JHY Tan and WSS Karwatowski

Abstract

Purpose The aim of this study was to determine the final visual outcome of patients who undergo complicated phacoemulsification cataract surgery in which the posterior capsule is compromised and vitrectomy was required.

Methods Data were collected for patients operated on over an 18-month period from the 1st of January till the 24th of June 1999 at the Department of Ophthalmology, Leicester Royal Infirmary. All grades of surgeons were included and patients were identified from the theatre logbook. A standard proforma was completed and the data evaluated.

Results A total of 2538 phacoemulsification cataract operations were performed over this duration. Of these, 2446 (96.4%) had uncomplicated phacoemulsification cataract surgery while 92 (3.6%) required anterior vitrectomy.

In order to allow for a more accurate interpretation of the visual outcome, patients were divided into two groups, depending on whether or not there was pre-existing eye disease at initial listing.

Sixty-five patients did not have pre-existing eye disease. From this, notes were available for 57 patients, whereby the best-corrected visual acuity (BCVA) was obtained postoperatively.

Vision of 6/12 or better was used to define acceptable postoperative vision. This group consisted of 49 patients (86%): five had visual acuities of 6/12, 26 = 6/9, one = 6/7.5 and 17 = 6/6. There were eight (14%) patients with poor visual outcome, largely represented by patients with cystoid macular oedema (8.8%).

The most frequent stage of vitreous loss was during primary phacoemulsification in

46 (50%). Irrigation and aspiration, which resulted in 21 (23%) instances, followed this.

The rate of posterior capsule rupture and anterior vitrectomy during phacoemulsification cataract surgery is 2% when performed by consultants, 4% by specialist registrars and staff grades and 10% by senior house officers.

Conclusion This study looks at the final visual outcome of patients who underwent unplanned anterior vitrectomy during routine phacoemulsification cataract surgery, in a university teaching hospital in the United Kingdom. It includes all levels of surgeons with varying experience. The rate of vitreous loss in this study for phacoemulsification cataract surgery is 3.6%. Patients who undergo complicated phacoemulsification cataract surgery do comparatively well.

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Introduction

Cataract surgery by phacoemulsification is the current method of choice in performing routine cataract surgery.¹ The small incision allows for a sutureless approach with a short visual recovery period. Additionally, this technique lends itself to newer methods of anaesthesia, such as subtenon's, intracameral and topical local anaesthesia.

In performing phacoemulsification cataract surgery, there may be instances in which the posterior capsule is compromised and the anterior vitreous face is disrupted, necessitating anterior vitrectomy.

Department of
Ophthalmology
Leicester Royal Infirmary
Leicester, LE1 5WW
UK

Correspondence:
JHY Tan
E-mail: jtan_ophth@
yahoo.co.uk

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A study was set up to include all grades of surgeons performing phacoemulsification cataract surgery in a teaching hospital in the United Kingdom. It set out to establish the incidence of vitreous loss and how this affected the visual outcome. The variables for those who failed to achieve a predetermined level of vision were further analysed. This study attempts to identify causative factors for unplanned anterior vitrectomy in routine phacoemulsification cataract surgery. Additionally, it highlights the different stages of the procedure when vitreous loss is encountered.

Methods

This retrospective study was carried out over an 18-month period from the 1st of January 1998 till the 24th of June 1999, at the Department of Ophthalmology, Leicester Royal Infirmary, UK. All grades of surgeons were included.

Patients undergoing complicated phacoemulsification cataract surgery would be logged as 'Phaco and anterior vitrectomy' in the theatre logbook. This was the method used to identify cases of phacoemulsification cataract surgery requiring anterior vitrectomy on a named patient basis. Patients who experienced vitreous loss with a conventional extracapsular technique were excluded.

Results

A total of 92 patients out of 2538 undergoing phacoemulsification surgery during the study period who required anterior vitrectomy were identified. In order to allow for a more accurate interpretation of the visual outcome, patients were divided into two groups, depending on whether there was pre-existing eye disease at initial listing.

Ocular pathology was found in 27 patients when they were listed for elective cataract surgery. Eight patients (29.6%) had age-related macular degeneration (ARMD), five (18.5%) had glaucoma, three (11.1%) had diabetic retinopathy (one, diabetic maculopathy; two, background diabetic retinopathy) (Figure 1).

This left 65 patients without pre-existing eye disease. Full results for 57 of these patients were available for analysis. The reason results were not available for eight patients were: two failed to attend for follow-up, there were no relevant entries in two sets of notes, one set of notes was unavailable and three patients were discharged to their opticians and no refraction results were available.

Visual acuity of 6/12 or better was used to define acceptable postoperative vision. A total of 49 patients (86%) achieved this vision: five had visual acuities of

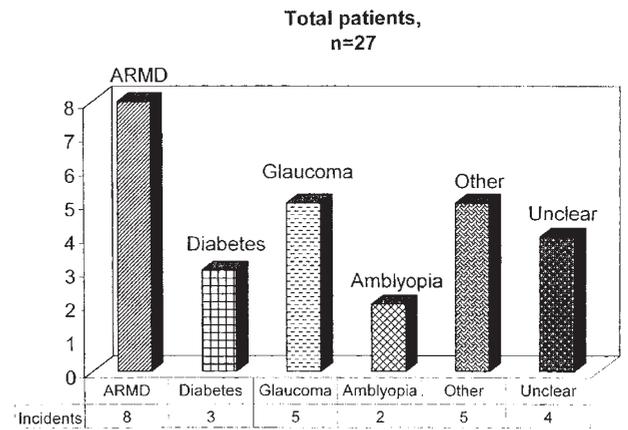


Figure 1 Pre-existing ocular pathology.

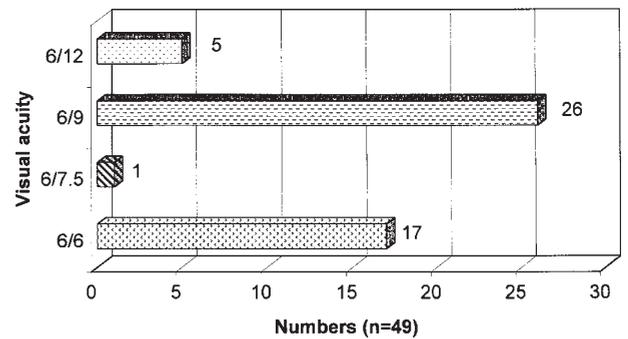


Figure 2 Number of patients with visual acuity of 6/12 or better.

6/12, 26 of 6/9, one of 6/7.5 and 17 of 6/6 as shown in Figure 2. If however 6/9 vision or better was used to define acceptable postoperative vision, 77.2% would achieve this level of vision in complicated phacoemulsification cataract surgery.

The group with a poor outcome consisted of eight (14%) patients as shown in Figure 3. The causes of

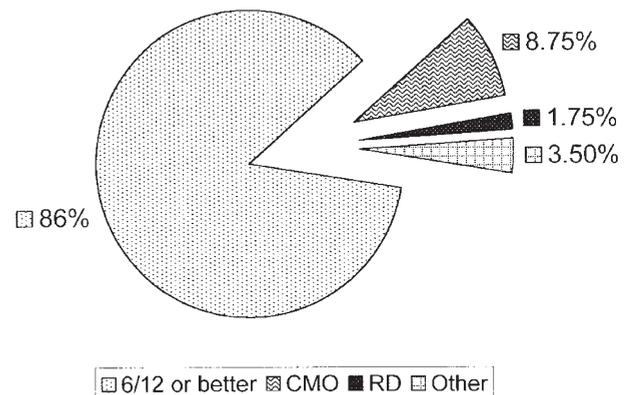


Figure 3 Best corrected visual acuity (n = 57). CMO, cystoid macular oedema. RD, retinal detachment.

poor visual outcome with visual acuities of worse than 6/12 is as follows: five developed cystoid macular oedema (CMO). One patient had counting fingers vision secondary to a retinal detachment. One patient had a thick posterior capsule band supporting the intraocular lens running across the visual axis, resulting in 6/18 vision. In another patient the cause of this reduced vision of 6/18 was not established.

Of the 92 patients who had complicated cataract surgery, 13 (14%) underwent further pars plana vitrectomy for dropped nuclei. From this group, there were five patients without pre-existing ocular pathology who achieved visual acuities of 6/12 or better. The BCVA for one patient was 6/6, three achieved 6/9 and another, 6/12.

A total of 2538 phacoemulsification cataract operations were performed over the duration of this audit. Nine hundred and ninety-five (39.2%) were performed by consultants, 1350 (53.2%) by specialist registrars and staff grades and 193 (7.6%) by senior house officers. Most of the complications, 56.5%, were encountered by specialist registrars and staff grades, 22.8% by consultants and 20.7% by senior house officers. The rate of vitreous loss during phacoemulsification cataract surgery was 2% when performed by consultants, 4% by specialist registrars and staff grades and 10% by senior house officers as shown in Figure 4.

Figure 5 shows that vitreous loss occurred during primary phacoemulsification in 46 (50%) cases, 12 (13%) during quadrant removal, while cracking in seven (8%) and during irrigation and aspiration in 21 (23%) instances. In 81 (88%) cases, anterior vitrectomy

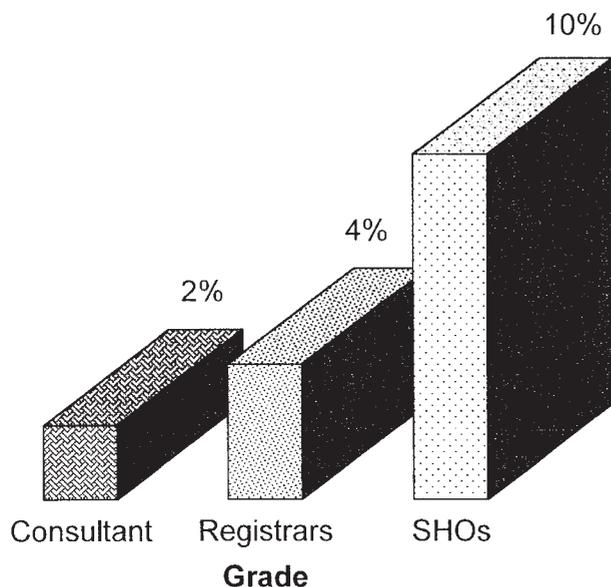


Figure 4 Rate of complications by grade.

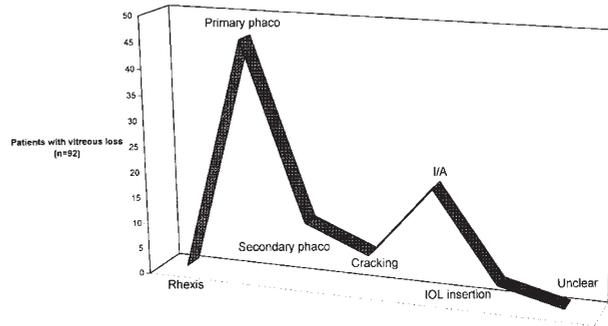


Figure 5 Stage of vitreous loss. I/A, irrigation aspiration. IOL, intraocular lens.

alone was performed to deal with the vitreous loss. For 10 (11%) patients surgery was converted to the extracapsular technique and in one (1%) case, the intracapsular technique was used in addition to performing anterior vitrectomy. A posterior chamber lens implant was used in 62 (67%) cases, an anterior chamber lens implant, in 19 (21%) and 11 (12%) patients were left aphakic at the time of vitreous loss.

Discussion

In our series, the visual results in patients who undergo complicated phacoemulsification cataract surgery compare well with other studies as illustrated in Table 1.²⁻⁴

Over the 18-month period of this retrospective study, 2538 phacoemulsification cataract operations were performed. Perioperative complications were encountered in 3.6% of cases. This compares to the National Cataract Surgery survey 1997-8, which found an incidence of 4.4% of capsule rupture and vitreous loss.⁵ In a tertiary care academic centre setting in the United States, vitreous loss varied from 1.8 to 5%.^{6,7}

The percentage of patients who underwent phacoemulsification cataract surgery under local anaesthetic was 84.8%. This reflects the trend in performing routine cataract surgery, found to be 86% in the national collection data.¹

Patients with postoperative pseudophakic CMO of

Table 1 Visual outcomes in complicated phacoemulsification cataract surgery

Authors	BCVA of 6/12 or better	Country
Current study	86.0%	UK
Ah-Fat <i>et al</i> ²	83.3%	UK
Tarbet <i>et al</i> ³	95.0%	USA
Teichmann <i>et al</i> ⁴	66.5%	Saudi Arabia

BCVA, best corrected visual acuity.

those with complicated cataract surgery (8.8%) represented the largest group with a poor visual outcome in this study. They obtained visual acuities of 6/18 and 6/24. The diagnosis of CMO was made on clinical grounds and none was confirmed on fluorescein angiography. Different approaches to the management of cystoid macular oedema have led to a wide range of reported incidences. Both medical and surgical therapy has been attempted. These include vitrectomy,⁸ highdose intravenous methylprednisolone,⁹ topical steroid or ketorolac¹⁰ and retrobulbar or subtenon's steroid.¹¹ All these show limited success.

To date, none of the patients with anterior chamber lenses has developed pseudophakic bullous keratopathy.

Previous studies looking at the visual outcome for complicated phacoemulsification cataract surgery were performed in different settings. In the United Kingdom, Ah Fat *et al*² performed a study, which only included phacoemulsification surgery performed by senior surgeons who were converting from conventional extracapsular cataract surgery. Tarbet *et al*³ looked at complications and results of phacoemulsification performed by residents at different stages of their training in an American ophthalmology program. An overall rate of surgical complications was 6.3% in their second year of training and 3.3% at the end of the third year.

However, this study looks at the final visual outcome of patients who underwent unplanned anterior vitrectomy during routine phacoemulsification cataract surgery, in a university teaching hospital in the United Kingdom. It includes all levels of surgeons with varying experience, which has not been previously reported.

This study shows the incidence of unplanned anterior vitrectomy in phacoemulsification cataract surgery of 3.6%, with a final visual acuity of 6/12 or better being achieved in 86% of patients. CMO represented the most common cause of a poor visual outcome. It found that the probability of encountering

vitreous loss during phacoemulsification cataract surgery was higher in junior trainees. However, the level of experience of individual surgeons and the degree of supervision of trainees has not been addressed in this study.

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