
POST-OPERATIVE IRIS PROLAPSE FOLLOWING PHACOEMULSIFICATION AND EXTRACAPSULAR CATARACT SURGERY

PETER J. FRANCIS and ROBERT J. MORRIS

Southampton

SUMMARY

Purpose: This study retrospectively compared and contrasted iris prolapse occurring following extracapsular cataract extraction and phacoemulsification.

Methods: The clinical notes of all patients who had undergone iris prolapse repair in the last 5 years at Southampton Eye Unit were recalled. Sixty-five patients (mean age 73 years; 41.6% male, 58.4% female) were identified out of a total of 7252 cataract operations performed (5983 extracapsular, 1269 phacoemulsification).

Results: Fifty-nine (93.3%) iris prolapses occurred following extracapsular surgery (83% had corneal incisions, 17% limbal). We identified 3 cases of phaco-related prolapse each of which occurred where the scleral tunnel had been extended to enable insertion of a 7.0 mm optic intraocular lens but had not been sutured. Overall, the average best corrected visual acuity achieved was 6/9.

Conclusion: The authors conclude that although iris prolapse is much less common following phacoemulsification, all scleral sections that are extended should be sutured.

Over the last decade, small-incision phacoemulsification has become the preferred method of cataract extraction. In experienced hands it is associated with a low complication rate and offers several advantages over its extracapsular counterpart, most importantly earlier visual rehabilitation and a more predictable refractive outcome. Attendant with this change in surgical technique has been an apparent drop in the number of cases of post-operative iris prolapse.

Little attention has been given to this subject in the literature. Prolapse is likely to be related to the type of section employed, poor wound construction and post-operative intraocular pressure rise. Ernest *et al.*¹

Correspondence to: Mr Peter J. Francis, Southampton Eye Unit, Southampton General Hospital, Southampton SO16 6YD, UK.

suggested that iris prolapse could be induced in cadaverous human eyes through limbal incisions by intraocular pressures of greater than 160 mmHg. This contrasted with two-step scleral tunnels where pressures of 400 mmHg were required and three-step scleral sections with corneal lips which were resistant to pressures in excess of 2000 mmHg. Naylor² and Browning *et al.*³ described an iris prolapse rate inversely proportional to the surgeon's level of experience, suggesting that wound construction and closure play an important role.

Patients appear to fall into two groups: those in whom prolapse occurs within the first few post-operative days and those in whom it occurs later. Again, the reasons for this are not known. In all cases iris prolapse warrants further surgical intervention with wound reconstruction and iris reposition/iridectomy to avoid persistent wound leakage, endophthalmitis and epithelial ingrowth.

The rate of iris prolapse following extracapsular cataract extraction has been reported as between 2.06%¹ and 3.1%;³ however, the incidence following phacoemulsification through a scleral or clear corneal incision has not been recorded. In this study we detailed iris prolapses occurring following extracapsular cataract surgery and compared and contrasted these with the small number subsequent to phacoemulsification.

MATERIALS AND METHODS

A list of all patients who had undergone iris prolapse repair following cataract extraction between 1 January 1990 and 31 March 1995 was obtained from the Southampton Eye Unit operating theatre book. Patients who had suffered traumatic iris prolapse were excluded. Their clinical notes were recalled and information regarding their operation and subsequent post-operative history was extracted from the operation notes and subsequent clinic visits.

All items of information could be obtained from every set of notes scrutinised.

All patients had undergone elective cataract extraction with insertion of a posterior chamber intraocular lens by either the extracapsular technique or phacoemulsification. The use of viscoelastic removed at the end of the procedure was universal. Extracapsular cataract extraction was undertaken through either a corneal or a limbal section closed with interrupted 10-0 nylon. Phacoemulsification was performed through a self-sealing sutureless scleral wound.

RESULTS

Sixty-five patients with iris prolapse following cataract surgery were identified during the last 5 years of operating at Southampton Eye Unit. Within this time, a total of 7252 cataract extractions had been performed (5983 extracapsular, 1269 phacoemulsification); the overall iris prolapse rate was, therefore, 0.85%. The rate of iris prolapse was relatively constant over this period, equivalent to 12.4 cases per year. Sixty-two patient records (96.8%) could be located and were recalled.

The mean age at the time of cataract extraction was 73 years (SD 10.4 years). Twenty-five patients (41.6%) were male and 35 (58.4%) were female. Twenty-eight (46.7%) iris prolapses occurred in left eyes whilst 32 (53.3%) occurred in right eyes. Twenty-nine (48%) occurred in patients who had surgery under local anaesthesia and 31 (52%) in those who had general anaesthesia. None of the patients had previously undergone intraocular surgery in the same eye. Some patients had previously undergone cataract surgery in the fellow eye. None had suffered iris prolapse in this eye.

Fifty-nine (93.3%) iris prolapses occurred following extracapsular cataract surgery. The prolapse rate following this technique was therefore 0.98%. Fifty (83%) patients had had corneal incisions and 10 (17%) a limbal section. In 2 cases cataract extraction had been complicated by vitreous loss requiring

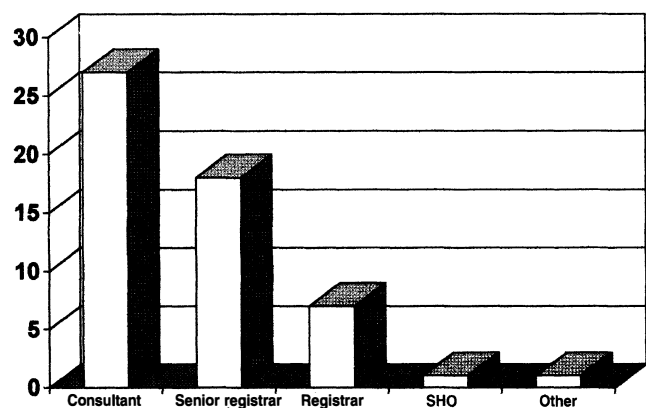


Fig. 1. Grade of surgeon performing the original operation.

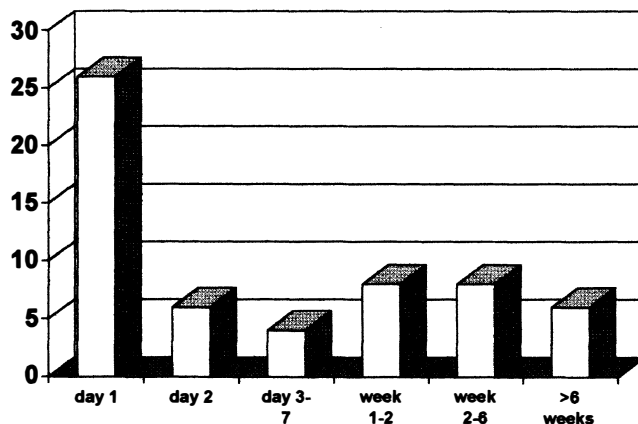


Fig. 2. Timing of iris prolapse.

automated anterior vitrectomy and sulcus-fixated posterior chamber lens implantation.

Three (5.0%) prolapses occurred following phacoemulsification, representing a prolapse rate of 0.2%. In each case a radial tear had occurred in the anterior continuous curvilinear capsulorrhexis and the scleral section had then been extended to allow the insertion of a 7.0 mm optic sulcus-fixated intraocular lens (instead of the preferred 5.0 mm lens). The wound was not sutured. No vitreous loss was recorded and in each case the posterior capsule was observed to be intact.

Fig. 1 shows the grade of surgeon performing the original operation. Fig. 2 shows the timing of iris prolapse relative to cataract extraction. Twenty-eight cases (47%) occurred on the first post-operative day, 6 (10%) on the second, 4 (7%) between the third and seventh days, 8 (13%) between the first and second weeks, a further 8 (13%) in the ensuing 4 weeks and 6 (10%) subsequent to this. All 3 prolapses following phacoemulsification occurred on the first post-operative day.

Prolapse repair was undertaken in all cases within 36 hours of presentation, using a combination of wound re-exploration, iris reposition, partial iridectomy and wound repair. In 2 of the phaco-related

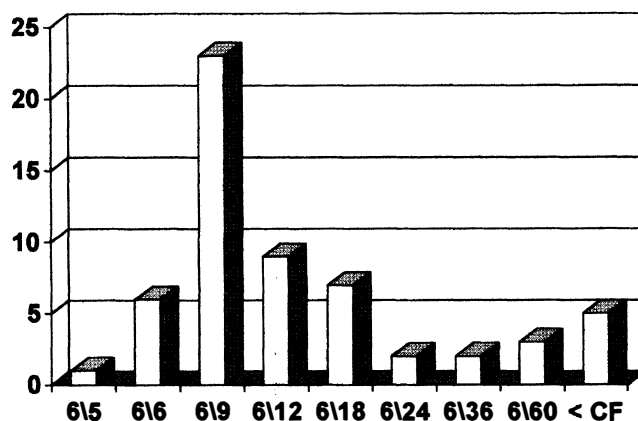


Fig. 3. Best corrected post-operative visual acuity achieved.

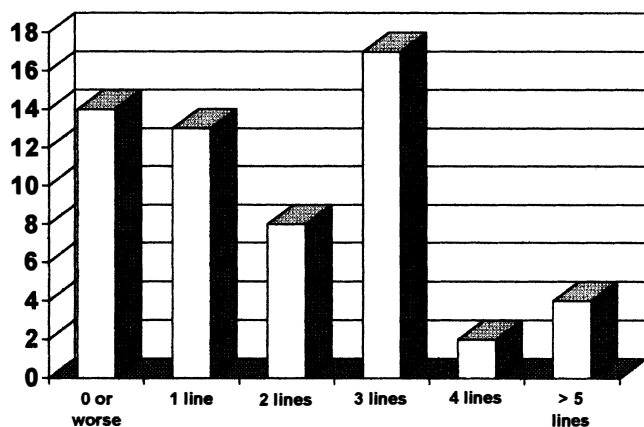


Fig. 4. Number of Snellen lines improvement in best corrected visual acuity following cataract extraction and iris prolapse repair.

prolapses the iris spontaneously self-repositioned following instillation of peribulbar local anaesthetic. The third case required only surgical iris repositioning. The scleral sections were then sutured with 2 10-0 nylon interrupted sutures to prevent further prolapse.

The median best corrected visual acuity achieved following cataract extraction and iris prolapse repair was 6/9. Fig. 3 details this visual outcome. The change between pre-operative and post-operative best corrected visual acuity is shown in Fig. 4. Following corrective suture removal, the average post-operative cylinder was 1.70 dioptres (SD 1.55 dioptres), axis 75° (SD 42°). No patient was left with clinically significant anisometropia.

The average number of clinic visits following prolapse repair was 4.9 (SD 2.1), with the average number of months until new spectacles were prescribed being 6.4 (SD 2.6 months).

Cases where iris prolapse had occurred more than 2 weeks after cataract extraction were further analysed. Fourteen patients were identified, all of whom had had extracapsular cataract extraction. Six had sutures removed at the second post-operative visit at 6 weeks. One had a Seidel positive corneal section 1 week post-operatively and 4 patients had sections which had been commented on as 'tight'. In no cases was an intraocular pressure rise documented, the average post-operative intraocular pressure on day 1 being 13.3 mmHg (SD 2.3 mmHg). Five patients had chronic respiratory disease and may have coughed excessively in the post-operative period, though this was not documented.

DISCUSSION

The rate of iris prolapse following cataract surgery in this study was 0.85%, which compares favourably with the results of other studies (Naylor 2.06%;² Browning *et al.* 3.1%³); this may reflect the percentage of operations performed by more experienced

surgeons in Southampton² and changing techniques over this period.

The rate of iris prolapse following extracapsular cataract surgery was 0.98%, which was significantly higher than that following phacoemulsification (0.2%, $p < 0.01$). The reason for this is most probably related to the use of a scleral tunnel rather than a limbal or corneal section. In terms of relative anatomy, the point of entry of a scleral section is closer to the iris root than for a corneal section, making it more difficult for the iris to distort and prolapse through the wound. Furthermore, any post-operative wound leakage may encourage the iris to plug a corneal incision, whereas the three-step tunnel is self-sealing, eliminating any risk of this. This hypothesis is supported by the post-mortem studies of Ernest *et al.*,² who found that scleral incisions could resist intraocular pressures up to 2000 mmHg – in contrast to limbal incisions in which the iris prolapsed when pressures exceeded 160 mmHg.

The timing of iris prolapse was variable. All three phaco-related prolapses presented on the first post-operative day. Overall, the majority (36) occurred in the first few post-operative days, most on the first day. However, 14 occurred more than 2 weeks following routine extracapsular surgery. Of this group, 4 patients had sections described as 'tight' and had sutures removed at the 6 week post-operative visit. One patient was noted to have a Seidel positive wound at 1 week and in the subsequent 2 weeks developed an iris prolapse. No other aetiological factors were identified.

No iris prolapses were observed following phacoemulsification and insertion of a 5.5 mm posterior chamber intraocular lens through a sutureless scleral tunnel. However, 3 prolapses occurred when the section had been enlarged to allow the passage of a 7.0 mm lens following development of a tear in the anterior capsulorrhexis. When the incision is widened in this way, its three-step construction may be compromised, implying that its self-sealing properties may be reduced. In none of the cases were the sections sutured and post-operative wound leakage may have encouraged prolapse of the iris through the section. In all cases where vitreous loss occurred the section was sutured, and it is only those cases associated with no vitreous loss which were not sutured.

It is interesting to note that two of the three phaco-related prolapses rectified spontaneously following the instillation of peribulbar anaesthetic. The reasons for this are not immediately clear, but presumably the position of the wound relative to the iris did not favour incarceration.

According to the National Cataract Surgery Survey III,⁴ the average number of post-operative visits is 2.87 (SD 1.00). Following iris prolapse,

patients required a significantly higher average of 4.9 visits (SD 2.1; $p < 0.01$), owing in most cases to suture-related problems. A consequence of this was that the eventual prescription of spectacles was delayed significantly ($p < 0.01$) from 3 months to 6.41 (SD 2.52 months).

The National Cataract Surgery Survey II⁵ indicated that 80% of patients achieve a vision of 6/12 or better 3 months following surgery. In our group, the average best corrected visual acuity was 6/9, with 68.3% achieving at least 6/12, suggesting that whilst iris prolapse is an unfortunate complication it is by no means a bar to good eventual visual outcome.

In summary, this study examined the rate of iris prolapse following cataract surgery; this was lower than previously recorded, in part reflecting the experience of surgeons performing surgery and in part related to changing techniques. Iris prolapse is much less likely following phacoemulsification than extracapsular cataract extraction, for reasons relating to wound anatomy, incision size and the self-sealing

properties of scleral wounds. Iris prolapse was only observed following phacoemulsification where the section had to be enlarged to permit the passage of a 7.0 mm lens. In this instance the authors would suggest that the section is sutured (preferably using circumferential sutures) to prevent post-operative wound leakage.

REFERENCES

1. Ernest PH, Kiessing LA, Lavery KT. Relative strengths of cataract incisions in cadaverous eyes. *J Cataract Refract Surg* 1991;17(Suppl): 668-71.
2. Naylor G. Iris prolapse: who? when? why? *Eye* 1993; 7:465-7.
3. Browning DJ, Cobo LM. Early experience in extracapsular cataract surgery by residents. *Ophthalmology* 1985;92:1647-53.
4. Desai P. The National Cataract Surgery Survey: III. *Eye* 1993;7:667-71.
5. Desai P. The National Cataract Surgery Survey: II. *Eye* 1993;7:489-94.
6. Courtney P. The National Cataract Surgery Survey: I. *Eye* 1992;6:487-92.