Phacoemulsification Post Pars Plana Vitrectomy (PPV): A Single Centre review of complications in cataract surgery after PPV

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Introduction: PPV is a commonly performed vitreoretinal surgery after which cataract formation is very common, with some studies reporting rate of progression of visually significant cataract at 100%. As a result, cataract surgery is required with the aim to improve visual acuity. Phacoemulsification after PPV is associated with higher risks of zonulopathy, posterior capsular rupture (PCR), dropped nuclear fragments and reportedly worse rates of visual acuity improvement compared with non-vitrectomised eyes. We aim to analyse intraoperative complications and resultant visual outcomes of cataract surgery after PPV at Sheffield Teaching Hospitals Trust (STHT).

Methods: A retrospective analysis was performed to identify all cataract surgery performed on eyes that had previously undergone PPV from January 2011 to March 2024. Data was compiled on: demographics (age/sex), intra-operative complication, stage of complication, resultant IOL, visual acuity outcome and grade of surgeon. Analysis using paired t-test was performed.

Results: Of 4000 cases analysed 35 (0.9%) operations had recorded complications. Of those 64% were male, 37% female and the average age was 62 years. These included 14 (40%) PCRs without vitreous loss, 13 (37%) zonular dialysis and 8 (23%) PCRs with vitreous loss or dropped lenses. The resultant intra-ocular lens (IOL) was placed in the bag in 14 (40%) cases, in the sulcus in 11 (31%) cases and the patient left aphakic in 10 (29%) cases.

For those aphakic patients, 80% had successful surgery to implant a secondary IOL. The mean improvement in visual acuity was 0.52 logMAR (95% CI 0.2 – 0.85; p = 0.0024) with 3 (14%) patients having worse visual outcomes; 2 were those left aphakic and 1 received an anterior chamber lens. There was an equal proportion of complications for both senior trainees (ST4-7) and consultants (37%).

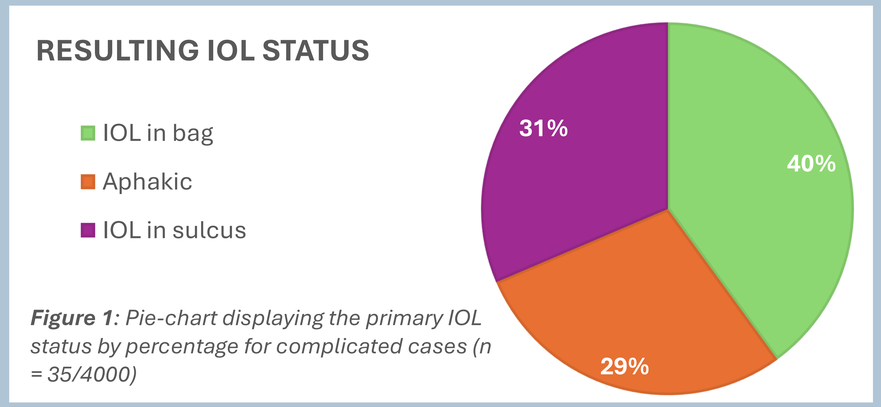


***Figure 1**: Pie-chart displaying the primary IOL status by percentage for complicated cases (n = 35/4000)*

Secondary Lens Placement Location	
Sulcus	2
AC	2
Scleral fixated	4
Remained aphakic	2

***Figure 2**: Table demonstrating secondary lens placement for those patients left aphakic after initial surgery (n = 10/35).*

Phacoemulsification operative complication	No. Cases
Zonular dialysis / dehiscence	13
Posterior capsule rupture - vitreous loss +/- lens drop	8
Posterior capsule rupture - no vitreous loss	14
No complication	3965

***Figure 3**: Table displaying the number of intra-operative complications (total n = 4000, complications n = 35)*

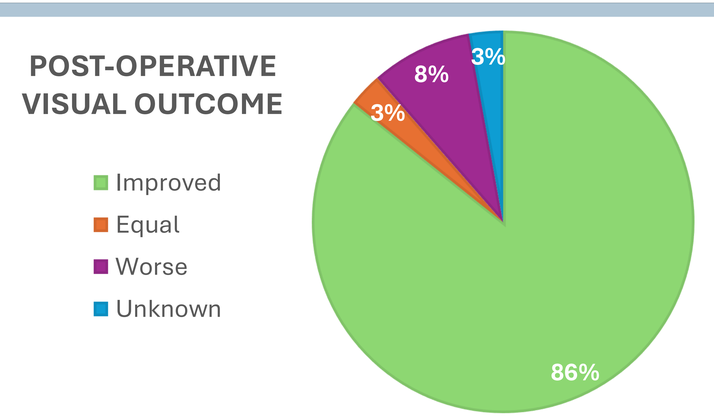


***Figure 4:** Pie-chart displaying patients visual outcomes calculated by comparing the pre-operative and post-operative (at ≥4months) visual acuity for complicated cases (n= 35/4000)*

Conclusion: Overall STHT experienced low complication rates in cataract surgery in post-vitrectomy eyes. Those with complications still demonstrated significant improvement in visual acuity in keeping with available literature.