Imperial College Healthcare NHS Trust
The Western Eye Hospital

Is Pars Plana Vitrectomy the Answer for All Posterior Capsule Tears?

A Five-Year Retinal Detachment Perspective

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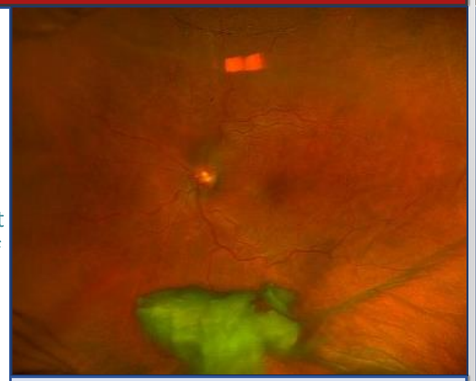
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Background

Posterior capsule rupture (PCR) is one of the most recognised and audited complications in cataract surgery.[1] PCR complicated by a dropped nucleus lens fragment (DNLF) is managed by secondary pars plana vitrectomy (PPV), otherwise only an anterior vitrectomy (AV) alone is performed.

Previous studies have demonstrated that patients who have cataract surgery complicated by PCR are at increased risk of rhegmatogenous retinal detachment (RRD) with a median time of 15 months.[2,3] Other risk factors for development of a RRD in pseudophakic eyes include younger age, longer axial length and male gender.[3,4]

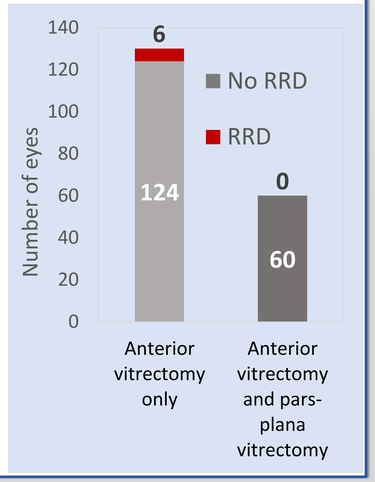
Aim: To determine the 5-year incidence of rhegmatogenous retinal detachments in cataract surgery complicated by PCR for patients who underwent **anterior vitrectomy alone compared to anterior vitrectomy followed by pars-plana vitrectomy**



A widefield optos fundus photo of a left eye with a dropped nuclear lens fragment post complicated phaco-emulsification. There is also a visible superior retinal detachment. The patient had a PPV and a retinal detachment repair.

Results

- 190 eyes from 190 patients were identified as having had complicated cataract surgery over the 5-year period.
- A total of 130 eyes of 130 patients were managed with AV alone
- 60 eyes of 60 patients were managed with AV followed by PPV
- Median age in the AV group was 74 (range: 29 – 91) and 74 in the AV + PPV group (range: 35-104)
- **Seven eyes** in the AV group developed RRDs whilst **zero eyes** in the AV + PPV group developed RRD ($p = 0.18$)
- Of the 6 eyes that developed an RRD, the median age was 75.5 (range: 62 – 88) with a median time to detachment of 10 months (range: 2 – 62)



Methods

- Electronic medical records of all patient who underwent cataract surgery at the Western Eye Hospital Imperial College NHS trust, which was complicated by a PCR, from 2013 to 2018 were retrospectively reviewed.
- The presence or absence of a RRD was identified at 5 years post-surgery. Demographic data was also collected.
- Patients who had already had a previous RD or a retinal tear prior to their cataract surgery were excluded.
- Those who did not have 5 years of follow-up data were included in the final analysis.
- Data was analysed using SPSS
- A Fisher's exact test was performed with statistical significance set at the 5% level

Discussion

- Although statistical significance at the 5% level was not achieved, we identified a clear trend indicating a reduced incidence of RRD in patients who underwent a secondary PPV versus an AV following complicated cataract surgery with PCR.
- Possible explanations for our findings include: the ability to intraoperatively identify and treat peripheral retinal tears during a PPV, the greater experience of vitreoretinal surgeons at conducting vitrectomies which may minimise retinal traction, and the complete vitreous clear-up achieved during a PPV thereby removing any future vitreous traction on the retina.
- Our study was limited by the low case numbers of cataract operations with PCR with DNLF. Further larger studies are warranted. A randomised controlled trial could be designed to compare the rate of RRD in cataract surgery complicated by PCR with no DNLF and either receiving AV or AV with subsequent PPV. However the feasibility of all PCRs being managed by vitreoretinal surgeons should be considered in our resource limited health-care setting.

1. Theodoropoulou S, Grzeda MT, Donachie PHJ, Johnston RL, Sparrow JM, Tole DM. The Royal College of Ophthalmologists' National Ophthalmology Database Study of cataract surgery. Report 5: Clinical outcome and risk factors for posterior capsule rupture and visual acuity loss following cataract surgery in patients aged 90 years and older. *Eye (Lond)*. 2019;33(7):1161-1170. doi:10.1038/s41433-019-0389-z
2. Thylefors J, Jakobsson G, Zetterberg M, Sheikh R. Retinal detachment after cataract surgery: a population-based study. *Acta Ophthalmol*. 2022;100(8):e1595-e1599. doi:10.1111/aos.15142
3. Petousis V, Sallam AA, Haynes RJ, et al. Risk factors for retinal detachment following cataract surgery: the impact of posterior capsular rupture. *Br J Ophthalmol*. 2016;100(11):1461-1465. doi:10.1136/bjophthalmol-2015-307729
4. Naderi K, Allen F, Dowlut S, Karia N, Chandra A. The risk of rhegmatogenous retinal detachment following anterior vitrectomy during cataract surgery: with versus without pars plana vitrectomy. *Graefes Arch Clin Exp Ophthalmol*. 2020;258(11):2425-2429. doi:10.1007/s00417-020-04843-0