

# United Kingdom National Ophthalmology Database Study of Cataract Surgery

## Report 3: Pseudophakic Retinal Detachment

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**Purpose:** To investigate time to pseudophakic retinal detachment (RD) after cataract surgery with posterior capsule rupture (PCR) to provide an evidence-based guide for postoperative management.

**Design:** Retrospective case series.

**Participants:** A total of 61 907 eyes of 46 824 patients undergoing cataract surgery.

**Methods:** Subanalysis of the United Kingdom Royal College of Ophthalmologists' National Ophthalmology Database from 13 sites where data on both cataract and vitreoretinal surgery were recorded on the same electronic medical records system. Overall, 61 907 cataract operations were performed between October 2006 and August 2010. Analyses were restricted to cases with at least 3 months of potential postoperative follow-up.

**Results:** Pseudophakic RD surgery was performed on 131 eyes of 129 patients (0.21%; 95% confidence interval [CI], 0.18%–0.25%). Of these, 36 were in eyes that had PCR during cataract surgery (3.27%; 95% CI, 2.37%–4.50%) and 95 were in eyes that did not have PCR (0.16%; 95% CI, 0.13%–0.19%). For eyes that progressed to RD surgery, the median time to pseudophakic RD surgery was 44 days for eyes with PCR, and 6.3 months for eyes without PCR. For all eyes (both with and without PCR), pseudophakic RD occurred earlier in cases performed by a trainee cataract surgeon.

**Conclusions:** Pseudophakic RD occurs earlier after cataract surgery complicated by PCR. Surgeon grade is a risk factor for pseudophakic RD. Posterior vitreous detachment and RD symptoms should be discussed with patients who undergo cataract surgery and have PCR to facilitate early attendance, and careful dilated postoperative examination for retinal tears is recommended in the first 2 months after surgery. *Ophthalmology* 2016;123:1711-1715 © 2016 by the American Academy of Ophthalmology.

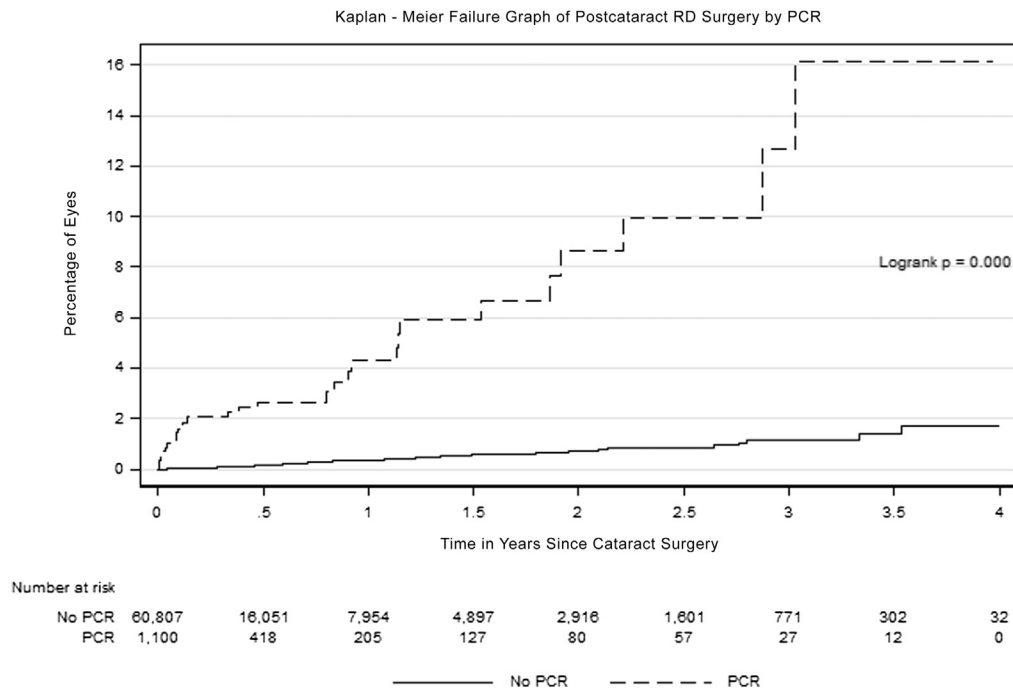
Posterior capsule rupture (PCR) occurs in approximately 1.92% to 2.09% cataract operations,<sup>1–3</sup> and PCR is associated with pseudophakic retinal detachment (RD).<sup>3–7</sup> In the Swedish National Cataract Register<sup>5</sup> and the United Kingdom Royal College of Ophthalmologists' National Ophthalmology Database<sup>3</sup> cataract analyses, the odds ratios for RD after PCR were 15 times higher within 3 years, 18 times higher within 1 year, and 42 times higher within 3 months than if PCR had not occurred. Data from a Western Australia entire population study using hospital discharge coding data estimated an adjusted hazard ratio of 27.6 at 5 years for RD after PCR,<sup>6</sup> whereas a recent similar analysis from France reported an adjusted hazard ratio of 4.4 at 4 years.<sup>7</sup> The aim of this analysis was to investigate time to pseudophakic RD after PCR to provide an evidence-based guide to optimal postoperative management for patients with PCR.

### Methods

Data were extracted from 31 United Kingdom National Health Service Trusts, of which 13 had recorded data on both cataract

surgery and vitreoretinal surgery on the same electronic medical record (EMR) system (Medisoft Ophthalmology; Medisoft Limited, Leeds, UK). Analysis was restricted to eligible cataract operations performed up to 3 months before the data extraction and from within each center from the date of the first record of an RD operation recorded on the EMR (because implementation of the vitreoretinal module of the EMR may have been later than implementation of the cataract module) and where a follow-up record was recorded at any point after cataract surgery. Additional eligibility criteria included operations performed on patients 18 years of age or older using phacoemulsification and where the primary intention was cataract surgery and not combined cataract plus other surgery, unless the other surgery formed part of the cataract operation (e.g., an operative maneuver to increase the size of the pupil). Eligible RD surgeries did not comprise lensectomy or fragmatome use as an operation component. Surgeon grades were categorized as consultant surgeons, independent nonconsultant surgeons, and trainee surgeons.<sup>3</sup>

The lead clinician and Caldicott Guardian (responsible nominee for data protection) at each National Health Service Trust gave written approval for anonymized data extraction. Anonymized database analyses of this type do not require



**Figure 1.** Kaplan-Meier failure graph of retinal detachment (RD) surgery after cataract surgery by posterior capsule rupture (PCR).

ethical permission because they are viewed as audit or service evaluation (see <http://www.hra.nhs.uk/research-community/before-you-apply/determine-whether-your-study-is-research/>). This study was conducted in accordance with the Declaration of Helsinki and the United Kingdom’s Data Protection Act.

Retinal detachment surgery occurring after cataract surgery was investigated using the Kaplan-Meier method,<sup>8</sup> where an operation for RD after cataract surgery was considered the event and all eyes were censored at the date of their last follow-up record if not undergoing RD surgery. Kaplan-Meier failure rates at 1, 2, and 3 years were estimated for eyes with and without PCR. All analyses were conducted using STATA software version 11 (StataCorp, College Station, TX).

## Results

All 61 907 eligible cataract operations were performed (between October 2006 and August 2010) by 454 surgeons, 25 of whom performed surgery at more than 1 grade. The cataract operations were performed on 46 824 patients, of whom 18 913 (40.4%) were men and 27 904 (59.6%) were women; the gender was not specified for 7 patients (<0.1%). The median age at the time of surgery on the first eye was 77.2 years (range, 18.1–103.9 years) and 77.9 years (range, 20.0–104.1 years) at the time of second eye surgery.

Posterior capsule rupture occurred in 1100 cataract operations (1.78%; 95% confidence interval [CI], 1.68%–1.88%). Over a median follow-up of 2.4 months (range, 1 day–4.2 years) RD surgery after cataract surgery was performed on 131 eyes of 129 patients (0.21%; 95% CI, 0.18%–0.25%), and the median age at the first-eye RD surgery was 69.8 years (range, 28.9–90.3 years). Of these 131 eyes, 36 were in eyes that experienced PCR (3.27%; 95% CI, 2.37%–4.50%) and 95 were in eyes that did not experience PCR

(0.16%; 95% CI, 0.13%–0.19%) from a median follow-up of 4.1 months and 2.6 months, respectively. The 1-, 2-, and 3-year Kaplan-Meier rates for pseudophakic RD were 0.30%, 0.81%, and 1.06% for eyes that did not experience PCR and 4.22%, 8.63%, and 12.07% for eyes with PCR, respectively (Fig 1 and Table 1).

From the 131 eyes that underwent RD surgery after cataract surgery, the median time to pseudophakic RD surgery was 6.3 months for eyes that did not experience PCR and 44 days for eyes that did experience PCR (Fig 2). For all eyes that underwent RD surgery after cataract surgery (regardless of whether complicated by PCR), there was a tendency for RD to occur earlier in cases where the cataract operation had been performed by a trainee surgeon with a statistically significant difference between the surgeon grades (Fig 3).

## Discussion

For eyes that progressed to RD surgery, the median time to pseudophakic RD surgery was 44 days for cataract operations complicated by PCR, and 6.3 months for operations without PCR. The Kaplan-Meier failure rate was statistically significantly higher for eyes that experienced PCR than for eyes that did not.

In a recent study by Daien et al<sup>7</sup> from France using hospital procedure coding data, the risk of RD after cataract surgery was estimated as 0.99% over 4 years. They also reported that pseudophakic RD accounted for almost 20% of all RD surgeries and that the 4-year cumulative risk of RD for the general population was 0.19%. Similar to the French study, we found that the overall risk of RD increased in a nearly linear manner with time; however,

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