

ON COMPLICATIONS TO CATARACT SURGERY

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Avhandlingen är baserad på följande arbeten:

- I. **Gunnar Jakobsson**, Per Montan, Madeleine Zetterberg, Ulf Stenevi, Anders Behndig, Mats Lundström. **Capsule complication during cataract surgery: Retinal detachment after cataract surgery with capsule complication: Swedish Capsule Rupture Study Group report 4.**
Journal of Cataract and Refractive Surgery 2009 Oct; 35(10): 1699-705.
- II. **Gunnar Jakobsson**, Madeleine Zetterberg, Mats Lundström, Ulf Stenevi, Richard Grenmark, Karin Sundelin. **Late dislocation of in-the-bag and out-of-the-bag intraocular lenses: Ocular and surgical characteristics and time to lens repositioning.**
Journal of Cataract and Refractive Surgery 2010 Oct; 36(10): 1637-44.
- III. **Gunnar Jakobsson**, Madeleine Zetterberg, Karin Sundelin, Ulf Stenevi. **Surgical repositioning of intraocular lenses after late dislocation: Complications, effect on intraocular pressure, and visual outcomes.**
Journal of Cataract and Refractive Surgery 2013 Dec; 39(12): 1879-85.
- IV. **Gunnar Jakobsson**, Karin Sundelin, Henrik Zetterberg, Madeleine Zetterberg. **Increased levels of inflammatory immune mediators in vitreous from pseudophakic eyes.**
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ABSTRACT

Cataract surgery, meaning exchange of the opaque lens in the eye with an artificial lens, is nowadays one of the most successful surgical procedures ever known. It is also the most frequent surgery performed in the Western world. In Sweden alone, more than 100,000 cataract operations are performed annually. Severe complications are rare, occurring only in a few percent of the patients, but owing to the large number of surgeries even infrequent complications amount to a substantial number of patients. The aim of this thesis was to study two different complications – retinal detachment (RD) and late artificial intraocular lens (IOL) dislocation – and to analyze inflammatory mediators in the vitreous of phakic (no previous cataract surgery) and pseudophakic (previous cataract surgery with IOL) eyes.

Methods: Paper I is a multicenter case-control study evaluating the incidence and outcome of RD in eyes experiencing a perioperative complication with rupture of the lens capsule. Paper II and III are studies on patients with late IOL dislocation with a retrospective and a prospective observational design respectively. In paper IV the level of inflammatory immune mediators was measured in vitreous from phakic and pseudophakic patients.

Results: The risk of developing RD after cataract surgery with a capsular rupture increased more than ten fold during the three-year follow-up period. Multivariate analyzes showed an odds ratio (OR) of 14.8 for RD. Additional risk factors were male sex (OR = 8.5) and lens remnants in the vitreous (OR = 14.4). The majority (62%) of eyes experiencing RD had a poor visual outcome of 0.1 or less. In patients with late IOL dislocation the median time to repositioning surgery was 6.5 years. This interval was significantly shorter in older patients and in eyes with perioperative complications (3.2 years). Pseudoexfoliations (PXF) were present in 60% of the patients and 36% had glaucoma. The annual incidence of late IOL dislocation in the pseudophakic population was calculated to 0.05%. Repositioning of the dislocated IOL with scleral sutures and a high frequency of pars plana vitrectomy procedures resulted in few complications and 59% of the patients obtained a visual acuity of ≥ 0.5 . In patients with IOL dislocation and glaucoma, improved intraocular pressure (IOP) control was observed. Vitreous samples revealed significantly higher and sustained levels of immune mediators in pseudophakic eyes compared to phakic eyes.

Conclusions: RD following capsule rupture results in profound visual loss in the majority of patients. Late IOL dislocation requiring reconstructive surgery occurs annually in 1/2000 pseudophakic patients. Risk factors are initially complicated cataract surgery, PXF and old age. The prognosis after repositioning surgery is good and IOP control in glaucoma patients is improved. Cataract surgery and pseudophakia induce elevated and sustained levels of inflammatory immune mediators in the vitreous.

Keywords: cataract surgery, pseudophakia, capsular rupture, retinal detachment, IOL dislocation, glaucoma, vitreous, immune mediators, immunoassay, cytokines.