

CATARACT

CATARACT SURGERY INCREASES RETINAL DETACHMENT RISK

Those at highest risk are young patients, males, myopes, and those who have no PVD

by Roibeard O'hEineachain in Budapest

Even with the use of the most modern and careful phacoemulsification techniques in otherwise healthy patients, cataract surgery carries an elevated risk of retinal detachment, said Horst Helbig MD, University Hospital, Regensburg, Germany, at the 14th ESCRS Winter Meeting.

Cataract surgery changes the physiology of the eye, Dr Helbig said. The smaller size and more forward position of the IOL, compared to the cataractous lens it replaces, causes a reduction in the volume of the lens and an increase in the volume of vitreous cavity. Moreover, the removal of the crystalline lens and the anterior capsule results in an alteration in the diffusion barriers between the vitreous and anterior chamber, and that in turn will lead to accelerated vitreous liquefaction, he pointed out.

"This is the clue to understanding the pathophysiology of pseudophakic retinal detachment. What we see is a change in the concentration of hyaluronic acid in the vitreous. It is much lower in aphakic eyes than in phakic eyes and it is lower after intracapsular cataract surgery than after extracapsular surgery. After cataract surgery the biochemical composition of the vitreous changes and we have posterior vitreous detachment [PVD] as a result," Dr Helbig added.

Direct evidence of an association between cataract surgery and PVD comes from a recently published study from New Zealand. The study showed that among 149 patients aged 50 to 60 years who underwent unilateral cataract surgery, the incidence of PVD after five years was 51 per cent in the

treated eyes, compared to only 21 per cent in their unoperated fellow eyes (*Hilford et al, Eye 2009; 23:1388-1392*).

Epidemiological studies provide evidence of an association between cataract surgery and retinal detachment. The Blue Mountain Eye Study (*Panchapakesan et al, Br J Ophthalmol. 2003; 87(2): 168-172*) and the Beaver Dam eye study (*Klein et al, Ophthalmology 1997; 104:573*) show that altogether around six per cent of the population have IOLs. However, statistics from Sweden Germany and Spain are consistent in showing that about one-third of patients with retinal detachment are pseudophakic.

Modern phaco provides limited protection

Dr Helbig noted that cataract surgery has changed considerably since the time of those population studies. Nonetheless, more recent evidence shows that a risk of retinal detachments persists even with more modern phacoemulsification techniques.

For example, in a Danish study which involved over 6,000 consecutive eyes which had undergone phacoemulsification during the years 1996-1998, the eight-year cumulative incidence of retinal detachment was nearly nine times higher than the incidence in the general population during the same period (*Boberg-Ans et al, Acta Ophthalmol Scand 2006; 84 (5): 613-618*). The relative risk was highest in the first years after surgery and tended to flatten out by 10 years, Dr Helbig noted.

Another finding of the study was that the risk of retinal detachment surgery decreased

as the age at surgery increased. Therefore, patients aged 59 years or younger at the time of surgery had a 10-fold higher likelihood of having a retinal detachment following cataract surgery, but those aged 70-79 years at the time of surgery had only a 2.6-fold higher likelihood for the complication and those 80 years or older had no increased risk. The study also showed pseudophakic men had a 2.5-fold increased risk for the complication compared to women.

The reduced risk among older patients probably derives from the fact that they will more likely have undergone an idiopathic PVD, Dr Helbig said. The detached vitreous, though displaced after cataract surgery by the partial evacuation of the capsule, imposes little if any tractional forces on the retina as it moves forward. On the other hand, even the apparent occurrence of a posterior detachment is not always enough to completely eliminate the risk of the complication.

"Usually we consider a posterior vitreous detachment to have taken place if the posterior pole is detached, but we've known patients who had an acute posterior vitreous detachment years ago and they still get a retinal detachment after cataract surgery," Dr Helbig cautioned.

Additional risk factors One still debated question in ophthalmology is whether and to what degree cataract surgery amplifies the already elevated risk of retinal detachment among myopes. The published literature provides considerable evidence of myopia's role in the complication, dating back to a study published in the 1950s (*Bohringer et al. Ophthalmologica 1956; 131: 331-334*). That study showed that by their seventh decade of life, patients had a 2.4 per cent risk of retinal detachment if they had -5.0 D to -9.0 D of myopia, compared to only a 0.56 per cent risk if they had -1.0 D or less of myopia.

In a more recent study involving more than 2000 patients with axial length greater than 27mm, researchers found using Kaplan-Meier-analysis that after 10 years about five per cent of eyes developed retinal detachment. Given that most cataract patients undergo surgery in both eyes, the



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Horst Helbig MD

data indicated that there was a 10 per cent risk of the detachment for each patient (*Neuhann et al, JCRS 2008; 34:1644-1657*).

"The steep increase appears to level after 10 years. That makes sense if you consider the slow effect of the changed barrier and the increased fluid currents that wash out the vitreous and change the composition of the vitreous and cause a posterior vitreous. This is a mechanism that takes time. So really it's not over when the phaco probe is out, it's not over for at least 10 years," Dr Helbig added.

A recent study from Taiwan in nearly 10,000 eyes (*Shen et al, AJO, 2010, 149, 113-119*) confirms the late increased rate of retinal detachment after cataract surgery describing an alarming 20 per cent rate of retinal detachments in young myopics 10 years after cataract surgery.

One way improved cataract surgery techniques could, in theory, reduce the incidence of retinal detachments after cataract surgery is by reducing intraoperative complications. A British case-control study indicated that capsular tears increase the risk of retinal detachment by 20-fold and zonular dehiscence increases the risk for the complication by 12-fold (*Tuft et al, Ophthalmology 2006; 113 (4): 650-656*).

"Based on this evidence I am convinced that cataract surgery significantly increases the risk for retinal detachment. The risk persists for at least 10 years and the most probable mechanism is that it induces vitreous liquefaction and posterior vitreous detachment. Those at highest risk are young patients, males, myopes, and those who have no posterior vitreous detachment," Dr Helbig concluded.

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