

Suprachoroidal haemorrhage

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As we progress towards the new millennium, many of us will be thinking of different ways of celebrating the event. One national project well under way is the Millennium Dome at Greenwich. The rapid appearance of this dome-shaped structure on the skyline should create a striking image – the memory of which may remain in our minds for many years. As ophthalmologists, the rapid appearance of a dome-shaped structure in the pupil during cataract surgery may create within us a very different feeling that may also remain in our minds for ever. The development of a suprachoroidal haemorrhage during routine ocular surgery can be a devastating experience for both patient and surgeon. In some cases, however, the visual outcome for the patient can be excellent.

Acute intraoperative suprachoroidal haemorrhage is one of the most feared intraoperative complications. In some cases this can produce a full exulsive haemorrhage with loss of the intraocular contents through the surgical incision site, or be more limited to a localised suprachoroidal haemorrhage. Delayed suprachoroidal haemorrhage occurring several days post-operatively can also occur. Sudden drops in the intraocular pressure (IOP) when the eye is opened during surgery can lead to transudation of fluid into the suprachoroidal space and allow the choroid to separate from the sclera. This in turn can lead to tearing of the vessels that cross the suprachoroidal space with subsequent bleeding.

Fortunately this complication is a rare event, but can happen during many different types of ocular surgery, having been reported¹ to occur during cataract surgery (0.16%), glaucoma surgery (0.15%), penetrating keratoplasty (0.56%) and retinal and vitrectomy procedures (0.41%) to name but a few. The incidence of delayed suprachoroidal haemorrhage is greater for glaucoma surgery (possibly due to post-operative hypotony), with reports^{1,2} of a 2–3% incidence for some procedures. In some studies the incidence varies with different types of cataract surgery, with a reduction being observed in the change from intracapsular surgery to extracapsular surgery³ (the

preservation of the posterior capsule thought to be a contributing factor¹) and from extracapsular surgery to phacoemulsification surgery.⁴ Different types of phacoemulsification techniques may also contribute to a lower incidence.⁵

Exactly why suprachoroidal haemorrhage should happen in some eyes and not others is still open to speculation, but several risk factors for its development have been reported including long axial length, glaucoma and high pre-operative IOP (incidence increasing with increasing IOP⁶), aphakia, vitrectomy, vitreous loss, use of anticoagulants, hypertension, arteriosclerosis and an intraoperative tachycardia (which may reflect sympathetic tone¹). More realistically a combination of risk factors probably accounts for some eyes being more at risk than others.^{1,7}

Visual outcome is dependent on the initial damage caused at the time of the haemorrhage. Early retinal detachment and 360° choroidal haemorrhage^{1,8,9} are reported as poor prognostic factors for visual outcome. Prompt action in the event of such an operative complication can help to limit the damage. Rapid closure of the wound to allow a build-up of IOP that helps to tamponade the bleed is important in the early management of this condition. The small self-sealing incisions used in phacoemulsification surgery allow such early closure to occur and may therefore help to limit any damage.¹⁰ The visual outcome, however, is not all 'doom and gloom' and patients can recover good visual function. In some series excellent visual outcomes are reported.^{4,11}

In this issue of *Eye*, Beatty and colleagues¹² in a retrospective international collaborative study report their findings on this potentially blinding condition. The study identified 45 cases of acute intraoperative suprachoroidal haemorrhage at six centres in three countries. For 33 of the cases two matched controls were found. The haemorrhage was 'surgeon diagnosed' and defined as exulsive if there was spontaneous nuclear expression and/or extrusion of the intraocular contents, or non-exulsive if these findings were not present. The complication

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occurred in a variety of procedures, but mainly (25 cases) during cataract surgery. In keeping with previous reports, longer axial length and higher pre-operative IOPs were found to be statistically more common in cases than controls. Visual outcome between types of procedure is difficult to compare in this study as the numbers involved for each individual procedure are small. However, following an intraoperative suprachoroidal haemorrhage only 12% of cases undergoing extracapsular cataract extraction versus 66% of cases undergoing phacoemulsification cataract surgery achieved a visual acuity of 6/12 or better. In the other cases the underlying disease may have played a role in the final acuity level. The figure of 12% for extracapsular cataract extraction may appear low compared with other studies, but in this study 46.6% of cases actually suffered extrusion of intraocular contents indicative of extensive damage, which could be expected to affect final acuity. The article discusses reasons why phacoemulsification may carry a better visual prognosis. Spontaneous nuclear expression, retinal detachment, four-quadrant suprachoroidal haemorrhage, and vision of less than perception of light at first dressing were shown to be factors associated with a poor visual outcome.

Modern phacoemulsification surgery with small self-sealing incisions may help to limit the problems caused by this complication, by allowing the section to be closed early and preventing extrusion of intraocular contents. Awareness of this complication and prompt action when it happens may again help to limit the damage caused. It is to be hoped that this will lead to a better long-term visual prognosis in affected eyes.

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