

Meeting the challenge of glaucoma after paediatric cataract surgery

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EDITORIAL

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Aphakic glaucoma continues to be one of the most serious causes of late visual loss following successful congenital cataract surgery. This type of glaucoma is notoriously refractory to treatment. Just as parents are coming to terms with the diagnosis and cataract surgery, they are faced with a second, potentially more devastating condition that will remain a lifelong threat to their child's vision.

Early acute-angle closure was once the most common cause of aphakic glaucoma because of pupillary block. It is now rare because of peripheral iridectomy being performed at the time of surgery, or more rigorous removal of the lens and anterior vitreous with the introduction of automated vitrectomy techniques. Open-angle aphakic glaucoma may complicate initial uneventful surgery at any stage and its pathogenesis is much more uncertain. Both chemical and mechanical theories have been proposed.¹ Inflammatory cells, lens remnants and vitreous derived factors may cause elevated intraocular pressure by obstructing the trabecular meshwork or they may adversely influence normal postnatal angle maturation. Mechanical factors such as the lack of ciliary body tension and its altered structural interaction with the trabecular meshwork may lead to the latter's collapse.

The incidence of glaucoma following childhood cataract surgery varies with duration of follow-up, and ranges from 5% with simple aspiration² to as high as 41% with lensectomy and ocutome vitrectomy with at least a 5-year follow-up.³ Risk factors for aphakic glaucoma such as microcornea,^{4,5} poor pupil dilation,⁶ early surgery,^{6,7} the need for secondary surgery^{8,7} and type of cataract⁵ are well documented. However, the role of posterior capsule integrity and intraocular lens implantation is less clear. Performing primary posterior capsulectomy and anterior vitrectomy

may provide an optimal setting for visual rehabilitation and reduce the risk of early pupillary block, but has this been at the expense of increased late-onset open-angle glaucoma? It is our definite impression that there were fewer cases of aphakic glaucoma when the posterior capsule was not sacrificed at the time of primary surgery following lens aspiration. Support for this in the literature is inconclusive because of the shorter follow-up for the lensectomy and vitrectomy technique *vs* simple aspiration.^{3,8} Asrani *et al*¹ suggest that primary posterior chamber intraocular lens implantation may decrease the incidence of open-angle glaucoma in congenital and development cataracts, but again with a short follow-up.

The therapeutic challenge that aphakic glaucoma presents is highlighted again by Mandal *et al*⁹ in this issue. They present the largest retrospective series of trabeculectomy both with and without Mitomycin C (0.4 mg/ml) performed in 23 Asian Indian aphakic (21) and pseudophakic (2) eyes. Overall, complete success (IOP between 6 and 21 mmHg without medication, further surgery nor sight-threatening complications) was achieved in only 37% after a mean follow-up of 2 years. No difference was noted between the two groups at the last follow-up, although the groups are small. Complications were more common in the group with Mitomycin C (MMC). When a similar definition of success was used by Azuara-Blanco *et al*¹⁰ in a smaller series of eight Caucasian patients, all trabeculectomies with MMC (0.4 mg/ml) failed following a mean follow-up of 18 months. This low success rate with MMC trabeculectomy in paediatric aphakic glaucoma has also been our clinical experience.

Poor results and serious bleb-related complications with MMC trabeculectomies in aphakic glaucoma have forced surgeons to explore other modalities of treatment. As with other secondary glaucomas, medical treatment

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provides only a short-term solution in this condition. Angle surgery does not provide good long-term control.⁷ Cyclodiode laser treatment can provide temporising treatment with occasional long-term control. However, as a rule, the majority of patients will require further laser within the year and virtually all medical treatment needs to be continued.¹¹

The success rates for drainage implants in paediatric aphakic glaucoma have been reported between 75 and 90% with a mean follow-up between 3 and 5.5 years, when combined with systemic antifibrosis therapy.^{12,13} The results are poorer without systemic therapy. Cunliffe and Molteno¹⁴ reported an 85% success rate (IOP \leq 21 mmHg with medications) with a mean follow-up of 11.2 years in a series where 44% of patients were aphakic. More importantly, 57% of eyes maintained vision at final follow-up.¹⁴ However, aphakic eyes as a group have higher rates of complications if hypotony occurs, particularly if the eyes are buphthalmic. Paradoxically, it may be this very group that requires adjunctive MMC in view of their tendency to fail. Techniques to avoid catastrophic hypotony must be used. Furthermore, drainage implants provide a better option than trabeculectomy in aphakic children who are contact-lens-dependent and at greater risk of late-onset bleb-related endophthalmitis.

Certainly, following congenital cataract surgery, irrespective of the method chosen, lifelong surveillance for glaucoma is crucial. At present, drainage tube surgery may be the best option to achieve long-term intraocular pressure control for this very refractory group of patients, despite its limitations. However, it is clear that we need to carry out more research so that we can understand the pathophysiology and further improve the prevention and treatment of this devastating complication of paediatric cataract surgery.

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