

Editorial: Monocular infantile cataract, intraocular lenses, and amblyopia

Those interested in amblyopia, unilateral cataract, and intraocular lenses in children should read the article by Burke *et al* in this issue. It raises again the problems that ophthalmologists face when trying to understand how to help these children.

The attainment of good vision in children after infancy with acquired unilateral cataract is not in question, but when the visual deprivation is from birth the prognosis is much worse, though there are several recent reports of good visual results.¹⁻⁴ To achieve these good results substantial obstacles have to be overcome: the patients have to be referred early, the surgery and optical correction should be completed successfully in the early days of the child's life, and amblyopia therapy should be started promptly and vigorously and continued for years. The critical problem in the management of unilateral congenital cataract is the amblyopia therapy.⁵ This necessitates adequate optical correction and occlusion of the healthy eye for several hours each day. If the treatment is completed later than six weeks of age, good visual acuity is rarely achieved, though there are reports of cases of truly congenital cataract in which acuities of 20/100 have been achieved with completion of treatment as late as 17 weeks of age. While a number of successful cases have been published, there must be many times that number of patients who have not achieved good acuity and have experienced considerable personal cost and inconvenience and some risk – for a condition which, if left untreated, is surely of minor significance to the child's life.

What represents a good visual result? Burke *et al* claim that 1/60 represents a significant improvement for a 'reserve eye'. Not all would agree with this, and vision compatible with a normal education (with some difficulty) might be more acceptable – say an acuity of 6/24. The age of surgery of Burke *et al*'s patients with non-traumatic cataract was 4.3 years and the youngest 0.3 years, so by current understanding they were unlikely to achieve good vision.

There are other than visual reasons for operating on unilateral cataract. They include the attainment of a good cosmetic appearance and the prevention of glaucoma from a swollen and anteriorly positioned lens in persistent hyperplastic primary vitreous. But for any possibility of good vision only treatment

completed by, at the latest, four months stands any chance of achieving good acuity – the earlier the better.

Units specialising in the optical correction of infant aphakia may expect to achieve over 80% acceptance rate of contact lenses in infancy.⁷⁻⁹ The ability to change the parameters of the optical correction is vital in view of the rapid changes in the eye in the first year of life. Spectacles can also be changed easily, but to treat adequately the amblyopia they have to correct up to 35 dioptres of hypermetropia, with attendant optical disadvantages.

Intraocular lenses have been implanted in children for many years.^{10,11} The surgery is not without complications.¹² Binkhorst¹² found significant complications in his patients who were treated with IOLs and a number of complications have been outlined by Hiles.¹³ Some of these may be serious,¹⁴ especially with anterior-chamber or iris-supported lenses and those made of more than one material. With single-piece lenses the long-term complication rate may be less, but this has yet to be proved. Since the life expectancy of most children with cataract is normal, the lenses will have to last their three score years and ten. Successful short term follow-ups as in most published papers cannot throw light on these all-important risks. With careful techniques and the use of modern lens designs, materials, and positioning, the problems of implantation are not insurmountable, as Hiles¹³ and Burke *et al* show. It is whether IOLs provide a safe long-term optical correction that is by itself appropriate in the management of amblyopia that is under scrutiny.

Intraocular lenses or epikeratophakia alone cannot provide an adequate optical correction throughout infancy. With refractive errors changing from a retinoscopy of +35 dioptres to +18 in the first year, any lens adequate for early infancy is bound to be inadequate later in the first year, leaving the eye substantially myopic, and it is difficult to justify the implantation of an adult-power lens without additional optical overcorrection for at least the first years of life.

Unilateral traumatic cataracts and secondary intraocular lens implantation in older children after contact lens failure may provide some indications for the implantation of modern designs of lenses, but the

long-term uncertainties and the immutability of IOLs may still raise doubts in the minds of ophthalmologists with a longer-term view. Failure or likely failure of parents to co-operate with occlusion is not an indication, because it applies to them whatever the form of optical correction. Failure to use contact lenses is difficult to predict, and although, this may be an indication for alternatives to contact lenses, targeting the recipient is difficult. A more acceptable method might be to use continuous-wear contact lenses for the first year and to carry out epikeratophakia when the child is over 1 year old, with a spectacle overcorrection.

Papers such as that by Burke *et al* should be read with care and with considered reflection on the relevance of IOLs in the treatment of the real cause of the visual defect in early onset cataract – amblyopia. The ethical problems of implanting lenses in infants may perhaps be overcome if the parents can be made fully to understand the risks and difficulties of the various forms of treatment; if modern intraocular lens styles, materials, and surgery prove to be safe in the long-term; if they are tolerated as well as and have a complication rate as low as contact lenses; and if all efforts are directed to treating the amblyopia. This is quite a challenge and one not yet accepted or fulfilled.

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