
Pediatric Ophthalmology and Strabismus Management in Hawaii

Malcolm R. Ing MD, FACS*

Outpatient strabismus surgery was being offered by the Washington D.C. (Costenbader-Parks) Fellowship in Pediatric Ophthalmology and Strabismus as early as the 1960's. This Washington group also championed early surgical alignment for strabismus.¹ Having completed this Fellowship in 1964, upon my return to Hawaii in 1968, I encouraged these techniques at the Queen's Medical Center and the Kauhaleolani Children's Hospital. The operating microscope for adult cataract surgery was becoming popular throughout the United States in the 1970's, and it was my belief that this technique could also be used in strabismus repair and pediatric cataract surgery. Of particular importance in pediatric cataract surgery, was the development of suction-cutting devices for the lens and vitreous in the early 1970's. The first course taught to local ophthalmologists (at the Waikiki Sheraton) on the modern vitrector (known as the Ocutome) was by Dr's Conner O'Malley, Ron Michaels and Steve Charles. This course led to the purchase of an Ocutome vitrector unit by Queen's Hospital in 1972. A new ophthalmic surgical era was introduced in congenital cataract surgery because the vitrector could prevent secondary clouding of the pupillary space by removing the posterior capsule and anterior vitreous. This technique of removing potential barriers to a clear visual axis is still very much in vogue today. The treatment of congenital cataracts was also enhanced by the development of "extended wear" contact lenses in the 1980's. These contact lenses need not be removed daily and were oxygen permeable. The Sauflons extended wear contact lens from England (later distributed by Bausch and Lomb) and the Dow Chemical silicone lens replaced the bulky aphakic spectacles. They are highly popular in visually rehabilitating infant eyes after cataract surgery.²

Shortly after starting practice in Hawaii, it became apparent that exotropia was more prevalent in Asian patients and esotropia in Caucasian patients. This was verified with the help of Dr Robert Worth and his associates at the University of Hawaii School of Medicine.³

In the 1980's the optimum time for the surgical alignment of congenital esotropia was being debated. Laboratory evidence favored earlier visual rehabilitation and surgical alignment. Hubel and Weisel, who won the 1982 Nobel prize in medicine for their investigative work, had completed a series of experiments closing the lids of young mammals. The data supported the concept of a physiological time window in animals and humans, when the visual cells could be stimulated and developed. Permanent amblyopia would develop beyond this time window - if the visual defect had not been treated. In 1978 I embarked on a three year multi-center, independent, masked study of 160 surgically aligned congenital esotropia patients from the practices of 7 ophthalmologists (five in the United States, one in Canada and one in Europe). This was a "have prisms, will travel" study, in which motor and sensory tests on these children were personally conducted by me at various institutions. With the help of Dr Robert Worth, who did the statistical analysis of the collected data, it was proven that alignment before age two produces significantly better functional results (such as depth perception and fusion) compared to alignment after age two ($p = < 0.001$).⁴ Thus, a longstanding controversy in strabismus surgery was brought to a close.

Botulinum injection of the medial rectus muscle for treatment of congenital esotropia was introduced in the mid 1980's by Dr Alan Scott of San Francisco. However, a long term follow-up study published in 1993 in which I examined patients aligned by botulinum by Dr Scott and Dr Elbert Magoon of Canton, Ohio, showed that the functional results of botulinum injection were inferior to surgical alignment.⁵ Nevertheless, botulinum injection into over-acting lid muscles such as in blepharospasm and hemifacial spasm, did prove helpful and remains popular even today. In addition, botulinum injection of rectus muscle (to avoid surgical removal of a third rectus muscle that may cause interior segment necrosis) is still a useful adjunct in strabismus surgery.

The issue of surgical alignment before ages 6 to 24 months was introduced by Dr Ken Wright of California in a 1994 study.⁶ Doctor Wright's paper encouraged me to conduct another outcome study, in which the children I examined were aligned very early by Dr Wright and by Dr Gene Helveston of Indiana. This study showed that, even with alignment at ages three to five months, perfect stereopsis (depth perception) was a very rare outcome (1 out of 16

*Clinical Professor of Surgery
Division of Ophthalmology
Department of Surgery
University of Hawaii
John A. Burns School of Medicine

patients).⁷ Even when surgically aligned, before 6 months the binocular condition lacks refined stereo-acuity, however fusion and gross stereopsis are achieved in the vast majority of patients.

Recently, a prospective, randomized, multi-center study was initiated to determine if alternating occlusion prior to surgical alignment could produce better binocular vision. Honolulu was selected as one of fifteen research centers, along with major eye institutions in Los Angeles, New York, San Francisco and Baltimore. This study is only the second prospective, multi-center, randomized investigation ever to be organized in the field of strabismus management in the United States. The results will be determined independently in five years when the children are old enough to perform sensory tests, such as depth perception and fusion.

At present, pediatric ophthalmology is advancing in the use of intraocular lens in children as techniques are refined. Indeed, the use of intraocular lenses for children appears to be the new frontier in the 1990's. The long term effects of intraocular lenses in children, are not known. However, there is reason to believe that in selected cases successful implantation with minimal complications can result in satisfactory vision for many of these children. In summary, pediatric ophthalmology and strabismus management in Hawaii, like the other subspecialties of ocular disease, offers the same quality care as the major eye institutions on the mainland. With the use of earlier diagnosis and treatment, and more precise modern surgery, children and adults with the stigma of uncorrected strabismus should be a rarity in our community.

References

1. Ing, MR, Costenbader FD, Parks MM and Albert DG: Early Surgery for Congenital Esotropia. *AM J. Ophthalmology* 61: 1419-1427, 1966.
2. Ing, MR: Experience with Extended Wear Hydrogel Lenses for Aphakia. *Annals of Ophthalmology*, 13; 181-182, 1981.
3. Ing MR and Pang S: The Racial Distribution of Strabismus - A Statistical Study. *HMJ* 33; 22-23, 1974.
4. Ing MR: Early Surgical Alignment for Congenital Esotropia. *Ophthalmology* 90; 132-135, 1983.
5. Ing MR: Botulinum Alignment for Congenital Esotropia; *Ophthalmology* 100; 318-322, 1993.
6. Wright, KW, Edleman PM, Terry A. et al: High Grade Stereo-Acuity After Early Surgery for Congenital Esotropia. *Arch. Ophthalmology* 112:913-919, 1994.
7. Ing MR: Outcome Study of Surgical Alignment Before Six Months of Age for Congenital Esotropia. *Ophthalmology* 102; 2041-2045, 1995.

THE SUPPORT

With 1,700 American Express® Travel offices in 120 Countries around the world, we're there to help you almost anywhere you go. American Express® Travel is your home away from home.

THE VALUE

The volume of business we generate for our travel partners provides us extensive price advantages that we pass on to you, our customer. Let us show you how you can save money on air, hotel, car, cruise and tour arrangements.

THE SERVICE & EXPERIENCE

Dedicated to providing local personalized service, your American Express Travel team is composed of seasoned travel professionals. With over 250 years of experience among them, you can rest assured your travel arrangements will receive the attention to detail they deserve.

TRAVEL FINANCIAL SERVICES

American Express is your "one stop shop" for all your travel financial service needs, including Travelers Cheques® (7 major currencies), Foreign Exchange, Gift of Travel certificates, Gift Cheques, MoneyGram, etc.



AMERICAN EXPRESS CARDMEMBERS

We also provide American Express Cardmembers with services such as emergency check cashing, emergency card replacement and exclusive offers for Cardmembers.

You Make People Well. We Make Travel Easy.

For relief of travel headaches, take this ad and call us in the morning. Whether you're traveling for business or pleasure, nobody covers the world like American Express Travel.



Travel

COMMERCE TOWER

1440 Kapiolani Blvd. • Suite 104
(Corner of Kapiolani Blvd. and Keeaumoku Ave.)
947-7171 and 941-0568