How Do We Restore and Maintain a Clear Cornea in a Poor Rural Villager?

Penetrating Keratoplasty in Developing Countries and International Eye Banking

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In this issue, we have assembled from an international authorship recent information and opinion on the second leading cause of world blindness, that from corneal disorders. Much of the data required by a scientific publication is simply not available in developing countries, thus some information presented is of a more personal and anecdotal nature. We would like to thank our invited authors for their efforts in collecting data and documenting their experiences.

The focus of this special section, by nature of this Journal, is the surgical correction of corneal blindness. However, the successful rehabilitation of a patient with bilateral, visually disabling corneal scarring through penetrating keratoplasty can be seen as only part of the much more difficult problem of infectious and nutritional diseases that are the usual precursors of corneal blindness in developing countries, as discussed by Smith and Taylor in this issue.

Trachoma can be considered a sensitive indicator of a community’s socioeconomic position with widely fluctuating rates found within the same country and between different groups, as is found in the Nepalese blindness survey. Taylor et al have shown the efficacy of face washing in the reduction of trachoma prevalence. When it is realized that less than half the world’s population has access to a safe water supply, achieving a meaningful reduction in blindness from sequela of trachoma appears impossible. However, it appears that even a minimal improvement in socioeconomic status can cause a marked reduction in the importance of trachoma as a blinding disorder. Foster and Gilbert discuss the relatively simple community measures that can be taken to reduce the prevalence of trachoma, xerophthalmia, ophthalmia neonatorum, and harmful traditional remedies.

The problem of assuring a safe supply of corneal donor material and provision of adequate training and resources to perform a penetrating keratoplasty may seem relatively simple when compared to the complexity of issues surrounding prevention of corneal blindness. Again, as adequately discussed in several of the articles in this issue, it is also a considerable challenge.

Issues surrounding corneal donation between different cultures and religions are discussed by Guzek. Silva relates a remarkable personal experience in creating the eye bank in Sri Lanka that has supplied thousands of corneas to Middle Eastern and Asian countries. The nongovernmental organizations involved in eye banking have reported successes in increasing the supply of corneal tissue to developing countries. For example, the Pan American Association of Eye Banks, as reported in this issue by Farge and Torres de Cadena, quadrupled the supply of corneas to Latin America over a 5-year period. Such progress suggests that the goal of self-sufficiency through the creation of eye banks in developing countries is a realistic one.

Most patients with corneal blindness in developing countries would be expected to have a poor prognosis for penetrating keratoplasty since the most usual scenario is a heavily-scared, vascularized cornea from previous trachoma with scarred, entropic lids. Despite the apparent difficulties, surprisingly good results have been reported from penetrating keratoplasties in developing countries. Corneal surgeons in developed countries are only too familiar with the irreversible damage that can be caused by delayed treatment of corneal rejection or microbial keratitis from a broken suture. Thus, it is

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even more satisfying when good results can be obtained under less than ideal conditions in developing countries as are shown in several of the papers and reviews.

Two articles on keratoprosthesis provide a 40-year personal experience by Cardona from Colombia, and a review of the procedure by Taylor and Paniel. As discussed by these authors, keratoprosthesis can only be expected to have a limited success, but offers the only solution to restore any vision for an unfortunate group of patients.

The issue of penetrating keratoplasty among underserved populations in developing countries should be a controversial one. While gratifying to the patient, surgeon, and supporting eye bank, it has no impact on the underlying causes of corneal blindness that are readily avoidable through simple community measures. Also, given the high prevalence of nutritional blindness and trachoma in poorer communities, it is an irony that those in most need of penetrating keratoplasty are perhaps the least likely to receive it. Diversion of the sources used for corneal surgery toward alleviation of community problems is theoretically attractive, but unrealistic. Eye surgeons, like most physicians, train to focus on an individual's needs rather than those of the community. Also, developed countries have not been particularly successful in altering community behavior to reduce the need for rehabilitative measures such as coronary artery bypass surgery.

What then should be the role of the ophthalmologist in the reduction of corneal blindness internationally? A review of the articles in this issue shows the remarkable individual achievements in the creation of eye banks, development of new techniques such as keratoprosthesis, and in obtaining good surgical results with penetrating keratoplasty. Corneal surgeons should be more involved in their community with efforts to eliminate avoidable causes of corneal blindness. Involvement in and education of community groups should be regarded as part of a corneal surgical practice. Eye banks should be encouraged to provide preventive and community focus, not just toward increasing donations in eye banking but also toward elimination of potential corneal blinding disorders. Thus, involvement in a measles vaccination program in a rural area may be considered just as much an eye-bank activity as recruitment of donors. The additional risks of penetrating keratoplasty in developing countries, such as poorer compliance and a higher proportion of poor prognosis grafts, should be recognized by considering the surgery incomplete until there has been a 2-year follow-up period. It is likely that only with more rigorous evaluation of the postoperative result and greater efforts at follow up will better understanding of penetrating keratoplasty in underserved areas of developing countries be obtained.

It is obvious that the problems of corneal blindness internationally are immense, but the progress reported by authors in this issue suggest that a reduction in the prevalence of corneal blindness is attainable.

REFERENCES