

healing of the RCE without complications such as recurrence of erosion, epithelial ingrowth, or corneal flap displacement. By 2 to 3 months after ASP, the only evidence of RCE or ASP was minute scars of ASP that were barely visible under slit-lamp examination (Fig 1F, H). All patients regained the good uncorrected visual acuity that had been achieved by LASIK but had declined with the occurrence of late RCE (Table 1).

The goal of intervention for LASIK-related RCE is to promote wound healing by augmenting collagen VII fibril anchoring to the underlying Bowman's layer and, most importantly, to avoid disturbing the corneal flap. Anterior stromal puncture exerts its effect by inducing limited subepithelial fibrosis, which in turn increases adhesion of the epithelium. In our series, careful manipulations during ASP were effective in preventing disturbance of the corneal flap, even when ASP was performed as early as 1 month postoperatively.

Because ASP leaves fine subepithelial scars, the procedure could affect vision if performed to treat RCE involving the pupillary axis. Although a single ASP procedure proved to be definitive treatment for our 4 patients, in other studies RCE has been reported to recur in 20% to 40% of eyes after ASP,<sup>3</sup> so the procedure may need to be repeated in some patients.

Other surgical treatments for RCE such as diamond burr polishing and phototherapeutic keratectomy may be of limited usefulness for LASIK-related RCE because the former could disturb the attachment of the corneal flap to the underlying bed and the latter can result in hyperopic shift. Alcohol delamination has recently been introduced to treat other kinds of RCE,<sup>5</sup> but this treatment should only be considered for LASIK-related RCE if the amount of alcohol applied can be adjusted to avoid damage to the underlying flap.

In conclusion, our results to date of performing ASP to treat LASIK-related RCE have been encouraging. We advocate early surgical intervention in cases of LASIK-related RCE, because prolonged corneal erosion and edema can lead to diffuse lamellar keratitis and epithelial ingrowth, even months after LASIK.

SUNG-HUEI TSENG, MD  
Tainan, Taiwan

## References

1. Ti SE, Tan DT. Recurrent corneal erosion after laser in situ keratomileusis. *Cornea* 2001;20:156–8.
2. Heyworth P, Morlet N, Rayner S, et al. Natural history of recurrent erosion syndrome—a 4-year review of 117 patients. *Br J Ophthalmol* 1998;82:26–8.
3. Reidy JJ, Paulus PM, Gona S. Recurrent erosions of the cornea: epidemiology and treatment. *Cornea* 2000;19:767–71.
4. Malecha MA. Anterior stromal puncture for recurrent corneal erosion after laser in situ keratomileusis. *J Cataract Refract Surg* 2004;30:496–8.
5. Dua HS, Lagnado R, Raj D, et al. Alcohol delamination of the corneal epithelium: an alternative in the management of recurrent corneal erosions. *Ophthalmology* 2006;113:404–11.

## Penetrating Keratoplasty for Keratoconus

Dear Editor:

I read with great interest the Pramanik et al article<sup>1</sup> describing the long-term outcomes of penetrating keratoplasty (PK) for keratoconus. However, there are some aspects that should be addressed by the authors.

Postkeratoplasty astigmatism is the most common complication after corneal transplantation, especially in keratoconus patients. The authors did not mention the uncorrected visual acuity (VA) and the range and mean of postkeratoplasty astigmatism. They merely mentioned the best spectacle-corrected VA (BSCVA) of the patients. There are many patients with acceptable BSCVA (20/40 or better) who cannot tolerate spectacles due to high refractive errors leading to anisometropia, anisocoria, and induced distortion of the image.

Corneal transplantation should be considered as a refractive surgery in this group of patients who may have fairly good preoperative BSCVA but are spectacle or contact lens intolerant.

The primary end point in their study was endothelial failure and/or immune rejection with a persistent cloudy graft for more than 3 months. However, there are a lot of patients with clear grafts who are unhappy due to high irregular postkeratoplasty astigmatism, and their VA is limited to their preoperative level and sometimes they may need regrafts. Therefore, the astigmatism end point is very important to the patients and is an important secondary end point.

Corneal graft size and donor–recipient disparity play important roles in postkeratoplasty refractive errors. The authors should have categorized the cases regarding graft size and disparity and compared the induced astigmatism and spherical refractive errors.

They have mentioned that “transplantation was performed by or under the supervision of a cornea faculty or fellow; a total of 18 different faculty or fellows did so for this patient series.”

Are there any corneal grafts performed by residents under the supervision of cornea faculty or fellows? There are some trends that increased experience with corneal transplantation improves the outcome of PK, considering the criterion of postoperative astigmatism as a measure.<sup>2</sup>

In conclusion, this study would take on greater value as “an important long-term benchmark of PK for keratoconus” if the authors had addressed these important aspects.

MEHRDAD MOHAMMADPOUR, MD  
Tehran, Iran

## References

1. Pramanik S, Musch DC, Sutphin JE, Farjo AA. Extended long-term outcomes of penetrating keratoplasty for keratoconus. *Ophthalmology* 2006;113:1633–8.
2. Gross RH, Poulsen EJ, Davitt S, et al. Comparison of astigmatism after penetrating keratoplasty by experienced cornea surgeons and cornea fellows. *Am J Ophthalmol* 1997;123:636–43.