Wound Dehiscence in a Patient With Keratoconus After Penetrating Keratoplasty and LASIK

Residual refractive error often complicates penetrating keratoplasty (PKP) and can be treated surgically in patients who are contact lens intolerant. Both photorefractive keratectomy and laser in situ keratomileusis (LASIK) have been used to reduce postoperative myopia and astigmatism following PKP. Reported complications of LASIK following PKP include irregular astigmatism, photoablation decentration, stromal bed hemorrhage, obstruction of the microkeratome path by graft sutures, corneal perforation, flap dislocation, melts, slippage, graft suture, corneal perforation, keratoconus, PKP, and LASIK in his right eye was seen by a local ophthalmologist who identified wound dehiscence and a flat anterior chamber and referred the patient to our service. On our examination, the visual acuity was 20/400 OD, and the eye was hypotonous with an intraocular pressure of 0 mm Hg. Slitlamp biomicroscopic examination revealed a flat anterior chamber and a positive Seidel test at the 6-o’clock position. Fluorescein was noted to stream out from beneath the flap edge, but the overlying flap was edematous, and a dehiscence in the underlying and more centrally located graft-host junction could not be clearly identified. Inspection of the central cornea revealed a relatively lucent zone indicative of relative flap thinning consistent with a partial-thickness buttonhole (Figure 2).

Four interrupted 10.0 nylon sutures were placed inferiorly, traversing the graft-host junction and LASIK flap edge. The next day, visual acuity remained 20/400 OD, but the anterior chamber appeared deep and formed, the Seidel test result was negative, and the intraocular pressure was 13.5 mm Hg. An area of uplift, edema, and necrosis of the LASIK flap appeared along the nasal edge of the graft and LASIK flap (Figure 3), and further sutures were placed to correct the uplift. Two weeks following placement of these sutures, visual acuity remained at 20/400 OD owing to high irregular suture-induced astigmatism, but the flap edema had resolved, the flap edge necrosis and thinning appeared to have been arrested, there was good flap edge surface contour, there was no evidence of epithelial ingrowth, and the anterior chamber was deep and formed.

Comment. Although successful LASIK procedures have been re-

Figure 1. Slitlamp photograph shows the graft-host junction (A) just central to the laser in situ keratomileusis flap edge (B).

Figure 2. Slitlamp photograph identifying central corneal thinning (arrow) in the laser in situ keratomileusis flap.
ported in patients with keratoconus following PKP, it would seem obvious that the reduced stromal bed thickness of the keratoconic host would pose a risk for dehiscence. However, based on a search of the PubMed database, our description appears to represent the first reported case of wound dehiscence in this patient group. In patients with keratoconus who have undergone full-thickness grafting, the graft-host junction consists of thinned host stroma fused to a normal-thickness graft. This junction is particularly thin inferiorly because of the inferior displacement of the cone in patients with keratoconus. A LASIK flap created larger than the graft requires the flap to cross the graft-host junction into the thinned keratoconic host. As a result, the already limited adherence between host and graft is reduced by the thickness of the flap (Figure 4), thereby increasing the risk of dehiscence either at the time of surgery, or as appears to be the case described herein, following minor trauma. Surgeons and patients who consider a LASIK procedure in this setting should note this increased risk. Adequate time following PKP should be allowed to maximize healing of the graft-host junction, and the wound should be carefully evaluated preoperatively to identify particularly thin regions that are at increased risk for dehiscence. If LASIK is performed, the risk of graft dehiscence is likely to be reduced by limiting the diameter of the flap to within the graft-host junction, or creating a thinner flap that leaves a greater area of posterior graft-host adherence. However, as demonstrated in our case, the risk of buttonhole formation appears to be elevated when LASIK is performed following PKP; therefore, we would recommend that if appropriate, surgeons consider photorefractive keratectomy correction, thereby avoiding the risk of dehiscence or buttonhole formation.

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