cap, and microkeratome malfunction; early postoperative complications were interface particles, epithelial defects and epithelial ingrowth; and late postoperative complications were night glare, undercorrection over 2 diopters, and irregular astigmatism. In our series, the surgical complication rate was 3.1% (13 of 424 eyes).

Toric LASIK

In its predictability, the residual refractive status showed that 90.8% of eyes were within ± 1.0 diopter, and 74.6% of eyes were within ± 0.5 diopter of the intended correction (Fig. 1). In its efficacy, 88.5% of eyes were above 20/40, 71.5% of eyes were above 20/25, and 58.5% of eyes were above 20/20 in uncorrected VA (Fig. 2). As to its safety, 94.6% of eyes maintained or gained the best corrected VA, but unfortunately 3.9% of eyes decreased one line, and 1.5% of eyes decreased two or more lines of BCVA (Fig. 3). In its stability, spherical equivalent change post-toric LASIK showed that very mild myopic regression occurred with an average of -0.57 diopter within 1 month and thereafter revealed good stability (Fig. 4).[26,27] The cylinder axis change post-toric LASIK revealed that 68.5% of eyes were within ± 10 degrees and 86.9% of eyes within ± 20 degrees of the original axis alignment (Fig. 6), so the procedure provided accurate axis alignment. In vision recovery time, the best far VA (0.71 ± 1.33 weeks) was faster than best near VA (1.35 ± 1.54 weeks) and best night VA (2.41 ± 1.86 weeks) in recovery. As to patient feeling about the vision results, patients accounting for 93.8% of eyes were satisfied or accepted the surgical results (Fig. 5). In dissatisfied patients, visual problems in order of occurrence were decreased light contrast sensitivity, glare vision, poor night vision, monocular double vision, and decreased best corrected visual acuity.

The problems of toric LASIK most concerning to us were surgery related including intraoperative, early postoperative, and late postoperative complications (Table 2).[28,29] The most common intraoperative complications were inadequate suction pressure, microkeratome malfunction, free cap, thin and perforated corneal flaps, and eccentric laser ablation; early postoperative complications were interface particles, epithelial defects and epithelial ingrowth; and late postoperative complications were irregular astigmatism, night glare, and undercorrection over 2 diopters. In our series, the complication rate was 3.8% (5 of 130 eyes).

DISCUSSION

Aspheric multizone software in the Summit Apex Plus excimer laser offers a choice of the inner optical zone (4.5 or 5.0 mm diameter) and the outer ablation zone (6.0 or 6.5 mm diameter) with a treatment range from -1.0 to -22.0 diopters at 0.1-diopter increments. Aspheric multizone provides 100% of the desired correction within the inner optical zone and automatically tapers from 100% to 0% of desired correction from the edge of the optical zone to the maximum ablation zone diameter creating a seamless transition of the corneal surface. As (Fig.7) shows, aspheric multizone technology has the advantages of less tissue removal, a smoother edge contour, and programming ease as compared to single zone or stepped multizone technology.

The laser disc is a small refraction-coded PMMA button designed to create smooth ablations without the "stairstep" ablation pattern produced on corneas treated with wide-area ablation excimers. In the toric LASIK procedure, the laser disc is initially loaded into a cassette and placed in the optical rail of the Apex Plus laser. The excimer beam passes through the disc and translates a predetermined shape onto the corneal surface. This refraction-coded disc controls the shape of the laser beam on the cornea. Laser disc technology is designed to deliver the smoothest ablated corneal surface with the benefits of maximizing the optical effect while minimizing the cut depth. Laser disc technology offers corneal ablation of the optical zone (5.0 mm diameter) in sphere and cylinder correction with strong axis and the transition zone (up to 6.5 mm diameter) in sphere correction with the weak axis which gradually creates a smooth and step-free corneal surface (Fig. 8). The specifications of the laser disc are the treatment ranges of the sphere from -1.0 to -10.0 diopters and cyl-