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Sir,

In Turkey, measles epidemics are under control after extensive immunization programmes since the beginning of the 1980s. However, as Kwan pointed out, we still have older patients who may need cataract operations and there are still patients of all ages in third-world countries. As we share these patients in the modern, borderless Europe, we wish to share our experience also.

Keratitis is present in all patients with measles, however, only one-third of them have ocular symptoms. Measles virus is scattered throughout the whole cornea during the active period of the disease. Exposure also plays a role in the development of peripheral ulcers and adherent leucoma, particularly located at the 6 o'clock position in the presence of xerophthalmia, vitamin A deficiency, and superinfections.¹ Anterior segment reconstructions such as pupilloplasty, synechiotomy, and optical iridectomy are necessary during cataract operation.

Penetrating keratoplasty (PK) has a limited role in the treatment of blindness from corneal scarring due to keratomalasia, measles, and vitamin A deficiency.^{2,3} In the literature, glaucoma has never been reported in patients who underwent PK due to adherent leucoma caused by measles. According to our clinical experience, intraocular pressure must closely be watched in patients after PK. Secondary damage in the trabecular meshwork and peripheral anterior synechia related with measles may aggravate glaucoma after PK. Penetrating keratoplasty must be applied if the corneal scar in the central axis impedes vision significantly, and patients must be followed closely for glaucoma.

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Sir,

Progression of visual field defect in a normal-tension glaucoma patient after laser *in situ* keratomileusis

The complications of a laser *in situ* keratomileusis (LASIK) were reported (5.2%) to include the following: flap irregularities, free cap formation, diffuse lamellar keratitis, epithelial ingrowth, induced astigmatism, regression, and overcorrection.^{1,2} Progression of a visual field defect is also reported after LASIK.^{3–6} Here, I report a case of progression in a visual field defect after LASIK.

Case report

A 34-year-old man visited a local facility of a laser visual correction centre in February of 2001. Preoperative evaluation revealed that his best-corrected visual acuity was 20/12.5 in both eyes, with $-9.00 -0.75 \times 5$ in the right eye and $-8.50 -0.75 \times 180$ in the left. The corneal curvatures were 42.25/43.25 D in both eyes. The central corneal thickness was 577 μ m and 578 μ m in the right and left eye, respectively. The intraocular pressure measured by Goldmann applanation tonometry was 13 and 11 mmHg in the right and left eye, respectively. The vertical cup/disc ratio was 0.7 in both eyes. The

Figure 1 Humphrey 30-2 visual field of each eye before LASIK. The Japanese terms in this figure are equivalent to the English terms in Figure 2.

Figure 2 Humphrey 30-2 visual field of each eye 19 months after LASIK.

Humphrey visual field study (30-2 SITA-Fast program) disclosed a superior nasal step defect in both eyes (Figure 1). The mean deviation was -4.97 and -3.20 dB in the right and left eye, respectively. Bilateral normal-tension glaucoma was diagnosed at that time. He went ahead with a bilateral LASIK procedure using the EC-5000 excimer laser (Nidek, Japan) with an MK-2000 microkeratome (Nidek, Japan). A 9.0-mm-diameter corneal flap, $112\ \mu\text{m}$ thick, was fashioned, and a 6.5-mm ablation zone of $127\ \mu\text{m}$ in central depth in the right eye and $114\ \mu\text{m}$ in the left was performed. At 13 months after LASIK, the intraocular pressure was 5 and 4 mmHg in the right and left eye, respectively. The mean deviation of the Humphrey visual field study was -11.27 and -5.87 dB in the right and left eye, respectively. He was referred to us at the glaucoma centre of Inouye Eye Hospital due to a progression in his visual field defect in both eyes.

Uncorrected visual acuity of the right and left eyes, at that time, was 20/16 and 20/20. The intraocular pressure measured by Goldmann applanation tonometry was 6 and 7 mmHg in the right and left eye, respectively. The corneal curvatures were 36.00/37.00D in both eyes. The corneal thickness was 466 and $465\ \mu\text{m}$ in the right and left eye, respectively. Corneas were clear. A fundoscopic examination revealed a vertical cup/disc ratio of 0.8 in both eyes. The Humphrey visual field study (30-2 SITA-Fast program) revealed a worsening of glaucomatous changes in both eyes (Figure 2). The mean deviation was -11.78 and -8.77 dB in the right and left eye, respectively. At 22 months after LASIK, the intraocular pressure was increased to 12 and 8 mmHg in the right and left eye, respectively. The mean deviation of the Humphrey visual field study was -10.35 and -5.61 dB in the right and left eye, respectively. Topical latanoprost once daily was started in both eyes. Computed tomography of the head was within a normal limit.

Comment

As for glaucoma development associated with LASIK, there are several reports of secondary steroid-induced glaucoma.^{3,4} However, it is thought that the risk factor for progression of a visual field defect is not only due to long-term corticosteroid use, but also related to family history and the presence of ocular hypertension preoperatively.^{5,6} For example, Bushley *et al*⁵ report that a woman with a family history of normal-tension glaucoma developed a visual field defect after LASIK. Weiss *et al*⁶ report that a woman with ocular hypertension and a family history of glaucoma developed a scotoma in a superior temporal of the visual field after LASIK. To date, there are no reports of progression of a visual field defect in pre-existing normal-tension glaucoma after LASIK without any

evidence of a long-term treatment with corticosteroid. The reason why the man experienced progression of glaucoma may be associated with a procedure performed during LASIK and/or natural progression of normal-tension glaucoma. There is a step where a large pressure at a minimum of 65 mmHg is exerted during corneal flap formation.¹ Although the results of the Humphrey visual field study were variable, those after LASIK were worsen than those before LASIK. LASIK should be carefully performed in patients with glaucoma, especially for those with normal-tension glaucoma, since their optic nerve head may be more vulnerable against increase of intraocular pressure.

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