Association Between Ocular Dominance and Refraction—Uncertain Dominance

To the Editor:

The article by Eser et al., which was published in the September 2008 issue of the Journal of Refractive Surgery, is a welcome contribution to the growing literature on ocular dominance and its association with refraction. In this study, the hole-in-card test was used to assess dominance, with the process repeated several times. The eye that the individual used repeatedly to view distant objects was determined to be the dominant eye.

The authors report that of 2453 consecutive adult patients who had eye examinations prior to refractive surgery, 67% were right eye dominant and 33% were left eye dominant. Men had higher rates of right eye dominance (70%) than women (65%), but there was no statistically significant difference in mean spherical equivalent refraction between men and women (–2.12 diopters [D] and –2.38 D, respectively). The authors did not confirm any association between ocular dominance and refractive status.

The hole-in-card test is a simple and reliable test of ocular dominance, however, some well-recognized limitations exist. There are also likely to be situations in which a patient has uncertain dominance, ie, where one eye is deemed dominant at the first attempt, but the other eye dominant at repeated attempts. Such individuals may alter their dominant eye due to unknown or unmeasured variables, and so do not have fixed dominance. We were therefore surprised that the authors did not include an uncertain dominance category in their analysis. As all individuals appear to have been placed exclusively into either a right or left eye dominant group, substantial numbers of individuals in this “uncertain” category could have obscured certain differences between dominant and non-dominant eyes.

We performed a detailed assessment of a large population-based sample of children, predominantly aged 6 (n=1740) and 12 (n=2353) years. Right eye dominance was present in 54% of children, left eye dominance in 31%, and the dominance was classified as uncertain in 15% of the sample, similar to the 65:32:8 ratio reported previously, but different from that reported by the authors. We presume that the discrepancy between our results and those of the authors may be due to the absence of this uncertain category. Could the authors provide such data?

In accordance with the authors, we found that boys were more likely than girls to have right eye dominance (56.3% vs 50.1%, P=.004 and 58.6% vs 50.9%, P=.0003, for boys and girls aged 6 and 12 years, respectively), supporting the authors’ contention that gender is a relevant factor when testing ocular dominance. We also found that girls (11% and 22%, respectively) were more likely than boys (7% and 16%, P=.004 and P=.0003, respectively) to have uncertain dominance, which supports the authors’ supposition.

Chameen Samarawickrama, BSc(Med), MBBS*
Jie Jin Wang, MMed, PhD*
Paul Mitchell, MD, PhD*
Sydney, Australia

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Reply:

The authors mentioned that they performed a detailed assessment of a large population-based sample of children and checked for ocular dominance, and they found that the dominance was classified as uncertain in 15% of the children.

Reliability of testing ocular dominance is important. Checking ocular dominance of children may be contentious. For example, when one looks at a near object on the left, the image in the left eye is larger than the one in the right eye, and when one looks to the right, the opposite occurs. Thus, relative image size could trigger switches in eye dominance. Unstable ocular dominance was more frequent in poor readers. The hypothesis that this instability would lead to more errors and longer decision times for distinguishing left-right mirror-image figures was not supported. Dellatolas et al reported that only two-thirds of children showed perfect stability in eye dominance. There was some evidence that stability in eye use tends to increase with age. These three articles indicated that having a reliable ocular dominance test in children and a category named “uncertain ocular dominance” seemed not to be reliable, which is contrary to the study of the authors. Furthermore, in a

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Letters to the Editor

Recently published study, the percentage of uncertain eye dominance was reported as only 0.8%.1

Comparing our article with the ocular dominance rate of children, as the authors mentioned in their letter, seems inappropriate. Furthermore, uncertain dominance rates <1% were reported in the literature, which are inconsequential.

Ilker Eser, MD
Canakkale, Turkey

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Early Onset Ectasia Following LASIK: Long-term Follow-up and Correction

To the Editor:

We previously published one of the earlier reports of postoperative LASIK corneal ectasia.1 The patient, who underwent LASIK in August 1999, was unusual in that ectasia was first suspected in the right eye (the first eye of a bilateral procedure) 1 week following surgery. The contralateral eye did not manifest signs of clinical ectasia until 7 months later. Most of the published cases at that time were attributed to suspicious or abnormal preoperative topography.2,3 Although our patient had mildly asymmetric inferior steepening noted on preoperative topography studies, numerous experienced refractive surgeons who have reviewed them agreed that they did not represent a contraindication to LASIK surgery, even by current, more conservative standards.

Intraoperative measurement of residual stromal bed thickness following the keratectomy was not performed on our patient, as it was not a part of our (or most surgeons’) LASIK surgical protocols at that time. This measurement, now routinely performed by most surgeons, can indicate that an excessively thick flap has been created, which permits modification of the surgical plan, if necessary. We believe this critical measurement should be obtained during all LASIK procedures.

Subsequent to the publication of our article, it became known to us that a Chiron ACS microkeratome (Chiron Vision Corp, Irvine, Calif) with a 160-µm depth plate was actually used on this patient, rather than the Hansatome (Bausch & Lomb, Rochester, NY), as was indicated in our publication. We do not believe this error in any way affects the case presentation, but we present this information in the interest of enhancing the accuracy of the report.

Our patient was subsequently examined by other LASIK surgeons, and it was believed that the most likely explanation for the postoperative LASIK ectasia was that he appeared to have thick flaps, not appreciated at the time of surgery, which would have resulted in a laser ablation that was deeper than planned. Quantitative measurement of flap thickness, using ocular coherence tomography, was attempted unsuccessfully. The assembly of the ACS microkeratome and the surgery itself were uneventful, having been performed by an experienced surgeon and technician. One potential explanation for these thick flaps may be related to the patient’s body habitus. He was a tall (6 feet, 2 inches) and fairly obese (over 300 pounds) gentleman. A report published shortly after this procedure highlighted increased risks associated with penetrating keratoplasty surgery performed on morbidly obese patients, presumably due to a significant increase in intraocular pressure, which can occur intraoperatively.4 Perhaps a similar phenomenon could have played a role in this case.

Recently, we and others, have drawn attention to the fact that there are patients, even with modern screening techniques, who will develop postoperative LASIK ectasia for no apparent reason.5 At least some of the patients previously reported may have had excessively thick flaps, leaving residual stromal beds that were thinner than anticipated. It is possible that, as routine intraoperative pachymetry becomes more widely practiced, the incidence of this complication will diminish.

Randy J. Epstein, MD
Sanjay N. Rao, MD
Chicago, Illinois

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