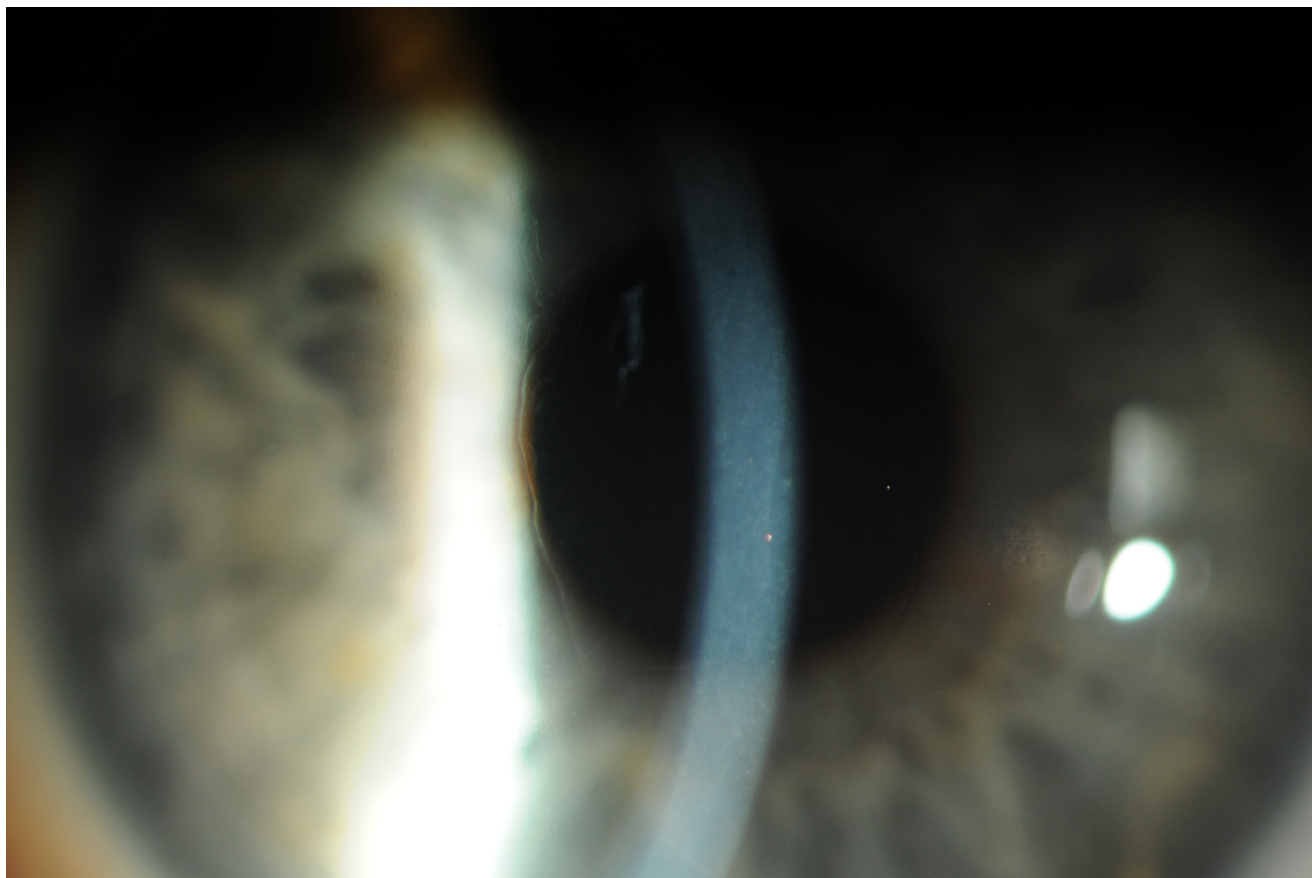


A wrinkle in LASIK

by Maxine Lipner EyeWorld Senior Contributing Writer



Microstriae

Source: Avi Wallerstein, MD

The latest on clinically significant flap striae

Flap striae can mar an otherwise successful LASIK procedure. Recent research published in the *Journal of Cataract & Refractive Surgery*¹ pegs the true incidence of this at 0.79% of cases that require intervention and considered risk factors and patient outcomes, according to **Avi Wallerstein, MD**, assistant professor of ophthalmology, McGill University, Montreal, Canada.

Investigators thought that since flap striae is the most common early postop LASIK complication, this was important to study further. “This is part of a refractive surgeon’s day-to-day practice, so it’s important to get granular and further understand it,” Dr. Wallerstein said.

Large study pool

Included in the retrospective

case-controlled series were 109,403 eyes that had undergone LASIK surgery in a multi-surgeon, multi-center practice. First, investigators determined the incidence and the risk factors for clinically significant post-LASIK striae, then looked at outcomes, Dr. Wallerstein noted. “For the ones that needed an intervention, we reported the outcomes both before we lifted the flap and irrigated and after the treatment was done,” he said. “Then we compared those to the non-striae contralateral eyes.”

Dr. Wallerstein pointed out that all the surgeons included in the study received the identical training in order to work under the umbrella of this multicenter practice. This meant that identification of patients with postoperative striae as well as postoperative removal was standardized, he stressed, adding that this makes the validity of the data even stronger.

New findings

Investigators learned a variety of things about striae. Prior to the study, the reported striae incidence varied between 0% and 13%. “In the large database that our study looked at, the incidence is 0.79%,” Dr. Wallerstein said. “That number is a true incidence, since it comes from more than 100,000 LASIK surgeries.” Knowing this can help improve informed consent and patient care, he pointed out.

One piece of new information investigators learned was that 23.5% of cases were bilateral. Dr. Wallerstein hypothesized that the reason that some patients develop bilateral striae may be an anatomical predisposition and host related.

When investigators considered potential factors that might predispose patients to striae, they determined that preoperative spherical equivalent and total ablation depth were the most significant risks, Dr. Wallerstein reported. “We found

that risk fit an exponential model,” he said, adding that the model they created could be used to derive the relative risk of developing striae as a function of the patients’ preoperative spherical equivalent.

“I know that a patient who’s treated for –10 D of myopia is 6.8 times more likely to develop striae than a patient who is treated for –2 D of myopia. That’s useful information for a surgeon to know to offer detailed informed consent to the patient and to plan surgical care,” he said.

Investigators found that the amount of time that passed since the LASIK procedure was completed was important. “Almost 10% of striae are detected in the first hour after surgery,” Dr. Wallerstein said. “That tells us we need to keep our patients around because this process of the flap not adhering completely and shifting occurs in the first few hours.” A simple change such as keeping patients an extra hour in clinic will allow practitioners to detect and immediately treat 10% of all striae cases, he noted.

In addition, the study addressed the idea that striae might induce some cylinder. However, this was not necessarily what investigators detected, Dr. Wallerstein observed. “We found that on average striae caused a mild hyperopic shift and that the majority—77%—don’t induce any astigmatism,” he said, adding that there is variability based on where the striae are located. Those located closer to the central visual axis might induce cylinder, and if they’re off-axis they might induce some higher order aberrations that contribute to decreased visual quality.

Investigators also learned that while striae can cause patients to lose between one and three lines of vision, treatment can usually correct this. The efficacy index improves by 25%, heightening the accuracy to close to the non-striae eye and allowing the safety index to return to that of the non-striae eye. However, there still may be a slight difference. “We found that 12% of those striae-treated eyes had one line or more of

difference between uncorrected distance vision and corrected distance vision," Dr. Wallerstein said, adding that 13% fewer striae-treated eyes attained 20/20 uncorrected distance visual acuity.

Also, the striae-treated eyes had a little more cylinder magnitude than the controls, Dr. Wallerstein pointed out. As a result, striae eyes were twice as likely to need an enhancement with an excimer laser than the non-striae eyes. "Surgeons now know that about 6% of striae-treated eyes will need a retreatment, compared to only 3% of non-striae eyes," Dr. Wallerstein said.

One study finding on flap thickness ran counter to reports in the older literature, which had indicated that thinner flaps had higher rates of striae, Dr. Wallerstein reported. "Our findings did not support that," he said. In addition, investigators think that if the eyelid is taped shut for a period immediately after surgery, it may confer a protective effect against striae. "That's not necessarily a conclusion, but it's a suggestion in that this is what our results showed," he said.

Dr. Wallerstein also advised practitioners not to wait around once they've found clinically significant striae. "Once you've determined that this is potentially clinically significant you should treat it early," he said.

This is the first study that looked at the outcomes of a surgically treated LASIK complication in a multi surgeon standardized protocol, Dr. Wallerstein pointed out. "What we have is a LASIK complication, then we treated it, looked at the outcomes, and compared the outcomes to a control," he said. "That's the first time that's happened when the protocol and the practices were controlled and standardized." Also important is the fact that this drew from a large electronic medical record database, he said, adding that going forward, such data mining will provide valuable information that will allow for the continued improvement of patient outcomes. **EW**

Reference

1. Wallerstein A, et al. Clinically significant laser in situ keratomileusis flap striae. *J Cataract Refract Surg.* 2017;43:1523–1533.

Editors' note: Dr. Wallerstein has no financial interests related to his comments.

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