

SMILE AND LASIK: SIMILARITIES AND ADVANTAGES

With no flap and more comfort after surgery, the new minimally invasive refractive surgery is a welcome option.

BY DOUGLAS WALLIN, OD



In more than 25 years working with optometrists in the area of refractive surgery, I have always emphasized educating patients on all of their options for vision correction. When patients have refractive error, options are glasses, contact lenses, or refractive corneal surgery. When it comes to surgery, choices have expanded over the years, from RK incisional surgery, to laser, PRK and LASIK, and now small incision lenticule extraction (ReLEx SMILE, ZEISS).

Patients who want surgical vision correction have often heard of LASIK and perhaps even PRK, but SMILE is somewhat new to the United States. I present SMILE to patients as part of a full list of surgical procedures because of the existing American and European data showing that SMILE is safe and effective.¹⁻³ I explain that like LASIK, SMILE is a way to remove tissue from the cornea to change its curvature and correct the refractive error. We have found SMILE to be as accurate as LASIK, and the pre- and postoperative procedures are very similar.^{4,5} Many consider SMILE to be less invasive, because we are not lifting a flap or removing epithelium, which produces some potential advantages, including less risk of dry eye, less risk of corneal sensitivity, and possibly better corneal biomechanics.^{4,5}

Preoperative Evaluation for SMILE

The preoperative evaluation for SMILE does not differ greatly from LASIK and PRK. Although SMILE uses only the femtosecond laser to create a lenticule of tissue, it follows the same Munnerlyn formula for removal of tissue used for LASIK. When we look at the curvature of the cornea and the thickness of the cornea, those limitations that apply to LASIK apply very similarly to SMILE.

We also look at the corneal surface, the eyelids and meibomian glands, and the tear film. We are looking for any corneal scars or opacities, anterior basement membrane dystrophy, or ocular surface disease that could throw off the accuracy of the SMILE procedure or adversely affect healing.

Postoperative Comfort and Visual Acuity

Immediately after the procedure, our SMILE patients tend to be a bit more comfortable than LASIK patients. In my experience, after the topical anesthetic drops wear off, our LASIK

patients often experience 2 to 3 hours of burning, watery, scratchy, light-sensitive eyes, whereas SMILE patients tend to feel more comfortable.

We prescribe antibiotic and anti-inflammatory eye drops, typically four times per day. Follow-up visits are scheduled the same as LASIK, at 1 day, 1 week, 1 month, 3 months, and 6 months.

Visual acuity recovery with SMILE is also comparable with LASIK. I typically see patients in the 20/25 to 20/30 range the morning after surgery, and then vision steadily improves during the first few days. Although there is no flap—just a lenticule removed from the cornea—the cornea needs to settle and smooth out. Patients tell us their vision keeps improving during the first 5 to 7 days. They tend to be comfortably in the 20/20 to 20/15 range by 1 to 2 weeks.

Potential Complications

During the SMILE FDA clinical trial and since FDA approval, our practice has seen very few complications. I always watch for epithelial ingrowth into the interface where the lenticule was removed. Epithelium grows fairly quickly, so we can easily see if any growth needs to be cleaned out soon after surgery. I capture a good manifest refraction after 1 week and topography as well to see if there is any residual refractive error after surgery.

A postoperative advantage of SMILE is that there is a small incision at the top of the cornea, so there is no need to closely watch the incision for changes or movement following surgery. Infection and inflammation are a risk with any corneal surgery, but these are rare when patients follow instructions and understand the need to protect their eyes. We quickly investigate any infiltrates in the cornea or in the interface to make sure infection is not the cause.

Rare Enhancements

SMILE patients are spherical myopes, who have some of the lowest enhancement rates with LASIK and PRK. In our experience during and since the clinical trial, the percentage of enhancements for SMILE matches that of LASIK patients with the same parameters. We wait at least 3 to 6 months to determine whether we need to do an enhancement. If there is a small amount of residual refractive error after everything has healed and the patient wants a fine tune, enhancement

CASE STUDY: SMILE'S WINNING IMPACT

In this illustrative case, a patient's higher myopia makes laser vision correction a wonderful option, and she is an excellent candidate for the SMILE procedure.

The patient: A 33-year-old woman was referred by her optometrist because she was having difficulty with dryness, especially with contact lenses, and expressed interest in laser vision correction. She had worn contact lenses for 19 years and found they were increasingly uncomfortable, with shorter and shorter wear time.

Current vision correction: OD: -6.50 sphere, OS: -6.25 sphere, cylinder 0.50 D.

Preoperative measurements: Topography was regular, with corneal thickness adequate for laser vision correction (Figure 1). Wavefront showed few higher-order aberrations (Figure 2). Examination of the ocular surface showed poor tear film quality and increased tear osmolarity.

SMILE candidacy: The patient's refraction was within the FDA range for SMILE (-1.00 D to -10.00 D, cylinder up to -3.00 D, MRSE up to -10.00 D).

Discussion: We discussed all of the options, including LASIK, PRK, and SMILE. She chose SMILE because it poses less risk for dryness issues and has a relatively short recovery. We also explained that no matter what procedure the patient selected, we would need to first get her out of her contact lenses and spend a few weeks getting her ocular surface symptoms under control.

Procedure: After ocular surface treatment, the SMILE procedure went as planned. Using the femtosecond laser (VisuMax, ZEISS), the surgeon made a lenticule and removed it through the small superior incision, reshaping the cornea. The patient was prescribed prednisolone/gatifloxacin combination drops four times a day for 1 week and then twice daily for 1 week.

Outcomes: Hours after surgery, the patient's eyes felt comfortable. At 1 day, the visual acuity was OD: 20/30, OS: 20/25+2. At 1 week, it was OD: 20/20, OS: 20/20+1. At 4 months, visual acuity is 20/15-2 in each eye. Following the surgery, the patient appreciated that she could see clearly without the discomfort of contact lenses, particularly the

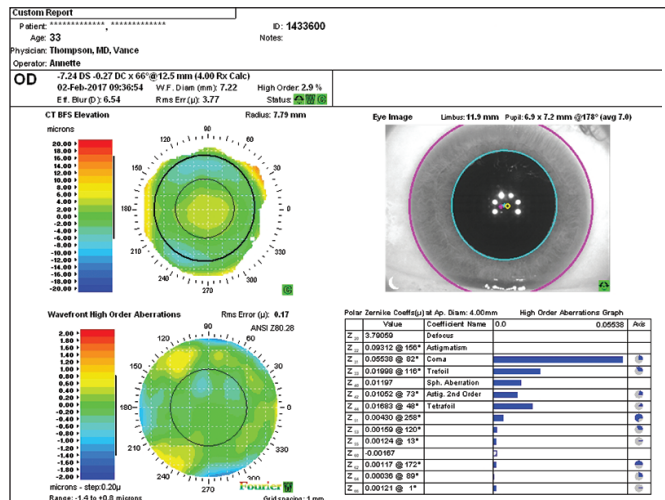


Figure 1. The patient's topography was regular, with corneal thickness adequate for laser vision correction.

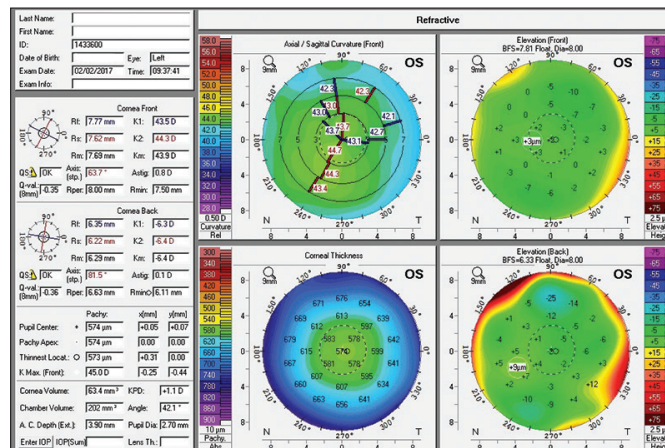


Figure 2. Wavefront aberrometry shows the patient has few higher-order aberrations.

end-of-day discomfort that was reducing her wear time. She was also pleased that her eyes appeared quieter and less red.

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for that small error is typically done with PRK or possibly LASIK, and the enhancement goes just as well as it does after LASIK. Although the procedures themselves are very different, the preparation, follow-up, and outcomes are analogous for LASIK and the new SMILE procedure. ■

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DOUGLAS WALLIN, OD

- Vance Thompson Vision, Sioux Falls, South Dakota
- douglas.wallin@vancethompsonvision.com
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