GETTING TO KNOW FEMTO: SIX FEATURES FOR SURGICAL SUCCESS

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After the LenSx Laser (Alcon Laboratories, Inc.) was FDA-approved, my colleagues and I at the Eye Center of North Florida knew it would be something truly outstanding for our patients. By October 2011, we were the first in Florida and 16th in the country to own one, and we have not looked back since. Although our practice serves a relatively middle-class community, our adoption rate to femto is approximately 50%, which, in my opinion, speaks volumes about my patients' interest in the technology. They ask for femto, are comfortable with it and are willing to pay out of pocket for the refractive outcomes that femtosecond lasers provide.[1,2]

Once the laser is installed, it is important for surgeons new to femto to get to know it, starting with the basics. The primary strengths of most femtosecond lasers in cataract surgery are in creating precise and pristine capsulotomies during cataract surgery,[3] performing effective lens fragmentation and creating consistent arcuate incisions on the cornea.[4,5] Therefore, spending adequate time perfecting these steps on an ongoing basis can pay significant clinical dividends for the practice in the near future.

If the LenSx Laser is the femtosecond laser of choice for the practice, then surgeons are met with a myriad of other capabilities and complementary devices that make this unit unique. Although the laser may be intimidating at first, each component was designed and built with postoperative patient satisfaction as the ultimate goal. Additionally, these special features can help surgeons elevate many aspects of cataract refractive surgery, from surgical technique to personal confidence, and to the practice as a whole.

LenSx Laser perks

Dock and treat

In my opinion, the LenSx Laser has always created nice, rounded capsulorrhexes that are more repeatable than what surgeons can do manually,[5] but before the SoftFit Patient Interface (PI) was introduced, I would occasionally encounter tags or tears to the periphery that would complicate the procedure. My colleagues and I did not originally use the SoftFit PI as it was not released until 2012. However, we have had the privilege of appreciating its before and after effects on patient outcomes.

With just one hydrogel contact lens-like piece, the interface conforms to the curvature of the cornea without distorting or compressing it, providing enhanced suction upon docking[6] (Figure 1). The SoftFit PI further perfects capsulotomies beyond the original LenSx Laser so that they are free-floating in most cases.[3,4] It also helps maintain lower IOP during the pretreatment phase with only an average 16-mm Hg increase in pressure.[7] Most important, in my opinion, is its effect on

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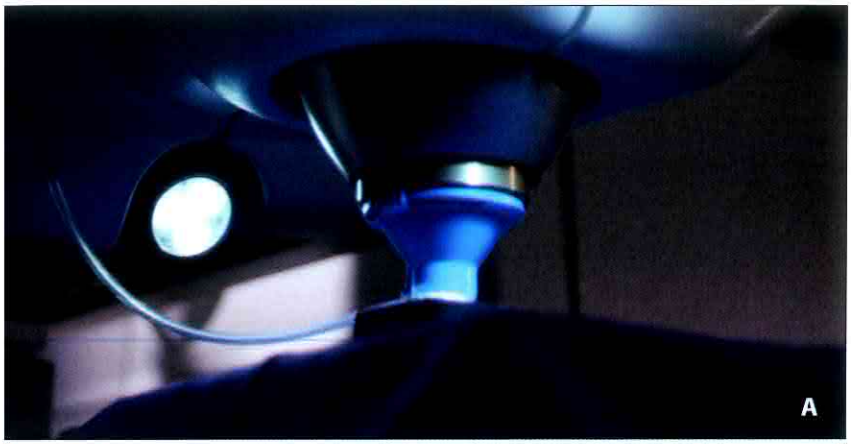

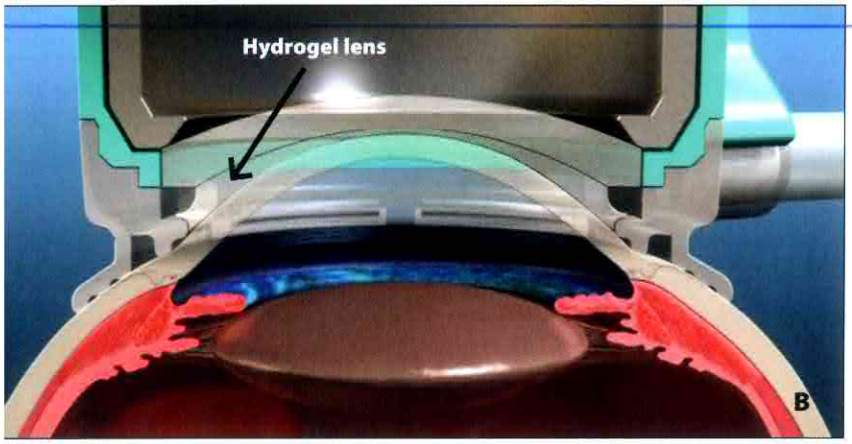

Figure 1. Close-up of the SoftFit PI (A). The hyrdrogel contact lens-like interface (B) prevents corneal distortion upon docking.

Source: Alcon Laboratories, Inc.

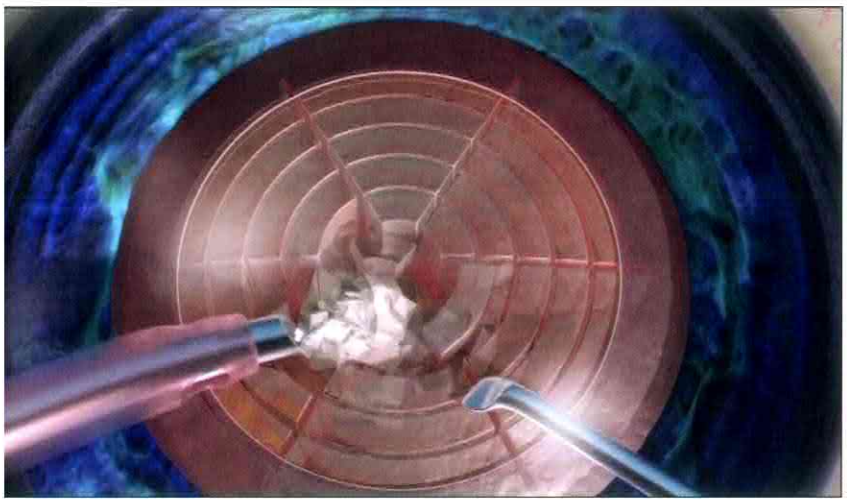

Figure 2. Fragmentation patterns such as this hybrid option ease phacoemulsification efforts in the operating room.

Source: Alcon Laboratories, Inc.

laser energy, which is consistent and much lower than in the past.

The SoftFit PI has contributed greatly to improved surgical outcomes for my patients with varying eye curvatures. However, it is difficult to dock patients with extremely flat or steep corneas. Although this is a rare occurrence, I look forward to using the new Alcon inserts that accommodate these types of eyes. The flat patient interface is designed for corneas 41 D and flatter, and the steep interface helps dock corneas 46 D and steeper.

Pick a pattern

From quadrants to cubes, lens fragmentation with the LenSx Laser has become better and, in my observation, more efficient with each software update. Fragmentation patterns are adjustable on a case-by-case basis, allowing surgeons the flexibility to address most grades of cataracts.[8] My partner prefers to vary his patterns based on the type of cataract he is addressing, whereas I am a "set-it-and-forget-it" surgeon and typically use a grid pattern for all my patients. The grid pattern works well for the softest of lenses to the densest,[8] so I feel confident before entering the laser suite that I can pretreat cataracts more easily than with manual methods.

Lens fragmentation with the LenSx Laser also results in benefits in the operating room during phacoemulsification (Figure 2). For example, the amount of cumulative dissipated energy and aspiration fluid I use after femto pretreatment is a fraction of what I would need after a manual lens disassembly. In addition, time spent in the operating room is decreased because of the laser's efficiency.[4,5]

High-def heads-up

Early adopters of the LenSx Laser have seen significant enhancements to its high-definition ocular coherence tomography (HD-OCT) system over the years. Once a patient is docked, images of the cornea and anterior chamber appear on the high-resolution heads-up OCT display. Cross sections of the anterior segment are shown alongside, allowing surgeons to easily visualize the placement of primary, secondary and arcuate incisions.

Surgeons can also get a sneak preview of the intraocular environment before entering the operating room. The HD-OCT displays anterior chamber depth and how all structures relate anatomically, which lets me know if I will be working in a crowded or unusually deep chamber. I can also view the density, depth and any abnormalities of the crystalline lens itself, which helps me further prepare for and perform cataract removal and IOL implantation.

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The extras

Plan ahead

Every good cataract surgery starts with careful preoperative planning and, in my experience, the Verion Image Guided System (Alcon Laboratories, Inc.) works seamlessly with the LenSx Laser by taking preoperative measurements and diagnostics, creating a surgical plan and transferring all data to the laser to reduce human error. Landmark reference images of the iris, limbus and pupil taken preoperatively help enhance tracking and registration intraoperatively. Combined with iris registration and pupil centration, I find that these features provide the precision needed for advanced-technology IOLs, especially multifocal IOLs.

> "In our laser suite, we take a team approach during every procedure."
>
> — BRET L. FISHER, MD

Stable chambers

Typically, patients who undergo cataract pretreatment with the LenSx Laser are also the ones who receive advanced-technology IOLs, so it is critical that these patients experience a good outcome, especially because they pay out of pocket for reduced dependence on glasses. In my opinion, the Centurion Vision System (Alcon Laboratories, Inc.), a phaco platform, plays a large role in achieving good postoperative results. Centurion provides greater chamber stability and better maintains IOP with the help of its Active Fluidics feature, which facilitates gentler surgery than passive systems by reducing occlusion break surge at any vacuum level.[9] Settings are customizable from surgeon to surgeon, and from LenSx Laser cases to manual cases.

Two hands or one

Because the SoftFit PI creates free-floating capsulotomies, I experience fewer hurdles with the LenSx Laser during cortical cleanup than with manual lens disassembly.[3,4] However, in the event some subincisional cortex remains, I use the Intrepid Transformer I/A Handpiece (Alcon Laboratories, Inc.), which allows for greater access underneath the incision and behind the IOL for viscoelastic removal. Surgeons unfamiliar or uncomfortable with bimanual cortical removal can use the standard coaxial mode, or it transitions to bimanual mode for placement into the primary incision for irrigation, and into the secondary incision for aspiration.

Surgical technique aside ...

In my practice, surgical technique is mostly about monitoring the situation and taking an active role in every step of the procedure to exact surgeon specifications. In our laser suite, we take a team approach during every procedure. We have a technician who programs the laser with patient-specific data, and an anesthesia team who administers either oral or intravenous sedation. I consider myself a systems monitor, and I make sure that the patient is properly aligned beneath the interface and comfortable to help prevent him or her from moving or squeezing the speculum. As long as surgeons are meticulous at every step, from achieving a complete, flat dock and centering the lens treatment to incision placement, patients will likely achieve good postoperative outcomes with the LenSx Laser, regardless of individual technique.[1,2]

Although there are many added benefits to owning all of the above components that make up much of the Alcon Cataract Refractive Suite, not all ophthalmologists have the means for or access to them. However, the LenSx Laser itself can stand on its own and is a powerful tool that has helped surgeons around the world provide patient satisfaction. In my opinion, the addition of the LenSx Laser into the practice, along with a surgeon's trusted phacoemulsification and IOL insertion techniques, can make the majority of cataract surgeries easier, whether they are routine or challenging cases.

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