Clinical Experiences With NEW *Ellips FX* Technology

The enhanced effect of lens extraction with *Ellips FX* Transversal Energy

**Contributors**

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**Introduction**

Roger Steinert, MD

As surgeons, we are continuously seeking out tools and technologies that can help enhance safety, improve control, and help us deliver the best postop outcomes during cataract surgery. During lens extraction, the phacoemulsification system you use and the fluidics and energy management systems it offers can significantly impact the outcome of your cases, whether routine or complicated.

With the introduction of *Ellips FX* Transversal Ultrasound, the WHITESTAR Signature System (Abbott Medical Optics Inc.) advances energy management technology to deliver smoother, more efficient lens extraction for all lens types, using either curved or straight tips. *Ellips FX Technology* represents an

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**Safety Information**

The WHITESTAR Signature System is a modular ophthalmic microsurgical system that facilitates anterior segment (cataract) surgery. Risk and complications may include broken ocular capsule or corneal burn. Patients are requested to check with their eye care professional for a complete listing of contraindications and risks. Caution: Federal (U.S.A.) law restricts this device to sale by or on the order of a physician.
advancement on the original Ellips Ultrasound, with several key improvements. When introduced in 2007, Ellips Technology demonstrated that the simultaneous blending of transversal and longitudinal phacoemulsification offered key benefits in efficient cutting, holding lens material at the tip, and working effectively with bent or straight tips. In the Ellips FX Technology, those same features have been refined—higher frequency cutting and a larger stroke path—to deliver extremely smooth cutting and excellent efficiency for hard and soft cataracts, with any technique or tip style.

Several leading cataract surgeons will discuss the benefits of Ellips FX Technology for their techniques and describe the experience of lens extraction with this new, high-performance technology.

Figure 1. Ellips FX Ultrasound is very effective with a straight tip (shown with 20-gauge tip) for faster lens removal, providing a blend of transversal and longitudinal motion at higher frequency.

For most cataract cases, I employ the supracapsular Tilt and Tumble technique. With this technique, I start by creating a large capsulorhexis, approximately 5.5 mm–6 mm, and then hydrodissect the cataractous lens thoroughly until the lens material begins to flip into the anterior chamber, where I remove the nucleus. This technique presents two primary advantages: 1) in bringing the lens material away from the posterior capsule, it reduces risk of posterior capsular rupture and 2) it allows the use of higher vacuum and flow rates. Phacoemulsification occurs at the same iris plane. Viscoelastic is used to protect the corneal endothelium and posterior capsule.

The functionality of the ultrasound handpiece during this stage of cataract surgery is critical, not only for cutting ability, but also for control over the smaller nuclear fragments that remain inside the eye. I have been particularly impressed with the new Ellips FX Technology, which provides very smooth cutting and enhanced followability to improve cataract removal, helping to ensure excellent postoperative outcomes for my patients.

When performing lens extractions, I use a 20-gauge straight tip and access both the peristaltic and venturi pumps available with the WHITESTAR Signature System’s Fusion Pump.

As soon as you begin removal of the lens material, you will notice the technology’s smooth, efficient cutting. The blending of transversal and longitudinal motion at higher frequency by the Ellips FX Handpiece (Figure 1) offers smooth, even, and highly efficient cutting. That efficiency allows me to manage down the power and minimize endothelial cell damage. Also, working with high vacuum, the unique movement of the tip minimizes clogging and contributes to the overall stability of the chamber.

Once you are further along in the case and working

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**Safe and Controlled Tilt and Tumble Technique**

Y. Ralph Chu, MD

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to remove the smaller lens fragments that remain in the eye, Ellips FX Technology stands out for excellent followability. Controlling smaller nuclear particles inside the eye is a key issue in protecting the endothelium. During emulsification and aspiration, smaller pieces can fly off of the phaco tip, bounce around the eye, and cause endothelial edema. I have found that Ellips FX Technology provides excellent hold, keeping particles at the tip and away from the cornea.

With smooth, efficient cutting and excellent followability, Ellips FX Technology helps contribute to improved outcomes for my patients. The unique features of Ellips FX Technology and the benefits that those features provide are highly effective with the Tilt and Tumble technique; however, I routinely use many techniques in my surgical practice, and I find the Ellips FX Technology to be effective for all.

**Highly Efficient Horizontal Chop**
Steven Dewey, MD

In any lens extraction, regardless of technique, there are several phases of the surgery where ultrasound energy management is critical. With its excellent followability and even cutting, I’ve found Ellips FX Technology to be the premier surgical removal modality.

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The high performance of the Ellips FX Handpiece effectively reduces lens turbulence and chatter.

— Steven Dewey, MD

For most lens extractions, I use a 20-gauge, 30-degree curved Dewey Tip and the Horizontal Chop technique. More recently, with the addition of a venturi pump for the WHITESTAR Signature System, I have converted from peristaltic vacuum to the venturi because of the efficiency that the technology offers during surgical cases.

Very early in the removal of the cataract, as I engage the nucleus to make the primary chop, Ellips FX Technology provides excellent purchase with the lens material. At the onset, I will either choose to impale for denser lenses, or hold the nucleus at the tip in softer lenses to split the lens into two hemisections. Rotating the lens, I then make a secondary chop, bisecting the hemisection to create a smaller quadrant that can be emulsified and aspirated. As I remove the quadrants, I’m watching closely how the fragments interact with the tip. When dealing with a softer cataract, Ellips FX Technology pulls the material to the lumen of the needle, where it is aspirated out of the eye. For these cases, Ellips FX Technology removes the lens material very swiftly in a controlled manner.

Figure 2. Ellips FX Technology provides a larger stroke path and simultaneous blending of longitudinal and transversal motion for efficient cutting and faster lens removal.

With denser nuclei, however, as the materials become resistant, Ellips FX Technology is designed to provide better followability and less chatter and turbulence. In cases with 3+ nuclei and higher, you are dealing with material that is more rigid, and the individual layers are more adherent to one another. With less advanced technologies, dense cataracts can cause clogging, create turbulence in the anterior chamber, and increase effective phaco time. Ellips FX Technology, however, with its larger cutting path (Figure 2) and higher operating frequency, quickly emulsifies the lens material. The high performance of the

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Ellips FX Handpiece effectively reduces lens turbulence and chatter, giving us an incredible efficiency of movement as the material seamlessly disappears at the tip. For me, the exciting aspect of cataract surgery is that each case is completely unique. What’s critical, though, is that I have the tools that help me handle whatever I encounter during surgery. Ellips FX Technology performs very effectively, helping to reduce chatter and turbulence, and maintain a stable chamber. These benefits contribute significantly to clearer corneas on postoperative day one, so the technology not only enhances surgery for me, it also helps enhance outcomes for my patients.

**Stop and Chop With Ease and Efficiency**

James C. Loden, MD

During cataract surgery, regardless of technique, tip style, or lens density, phacoemulsification energy management is a critical component affecting the outcome of the case. Typically, I use Stop and Chop, a technique that is enhanced significantly by smooth sculpting during the initial stages of lens extraction, as well as efficient emulsification and aspiration of lens material later in the case. I have been very pleased with my experiences using Ellips FX Technology.

Ellips FX Technology is a major step forward in increasing the efficiency and ease of lens extraction.

— James C. Loden, MD

For most lens extractions, I use a MST 0.9-mm bent 45-degree phaco tip, the Stop and Chop technique, and peristaltic and venturi pumps.

With Ellips FX Technology, the first thing a surgeon will notice is how well the technology cuts through the lens material. Like a hot knife through butter, the effect of the lens extraction is extremely smooth and even.

When sculpting the lens, I use continuous power with a 15% start, and a linear progression of up to 50% phaco power to create a fairly deep groove that measures approximately 1.5 times the width of the phaco tip prior to inserting the chopper to bisect the lens.

By simultaneously blending transversal and longitudinal movement, Ellips FX Technology creates an elliptical stroke path that adeptly emulsifies lens material without the clogging I’ve experienced with some traditional technologies. Even with very dense nuclei, Ellips FX Technology very smoothly utilizes the tip to create a deep, even groove.

As I remove the smaller lens fragments from the eye, Ellips FX Technology delivers excellent followability to create a very stable chamber with very little turbulence. In this stage of the procedure, I am especially focused on preventing endothelial cell loss, which is extremely important and contributes to excellent postop outcomes.

A key aspect in protecting the corneal endothelium is to ensure that lens fragments do not move against the corneal endothelium during surgery. Ellips FX Technology very efficiently holds lens pieces at the tip of the phaco needle, reducing chatter and turbulence. In my experience, I have found that the followability of Ellips FX Technology exceeds that of Ozil.

Having worked with several systems and phacoemulsification technologies, I feel that Ellips FX Technology is a major step forward in increasing the efficiency and ease of lens extraction.