

Letters

Debating Laser Cataract Surgery

The following exchange refers to an article to which Dr. Safran contributed. Titled "Evaluating the Impact of Laser-Assisted Lens Capsulotomy," this article by Laura Straub, Editor-in-Chief of CRST Europe, appeared in our January 2014 edition.

I really enjoyed reading this article, but I must take exception to some comments made in the Views From the Experts section, particularly those voiced by Steven Safran, MD.

Dr. Safran started by stating, "I do not use a femtosecond laser, as I feel it adds time, expense, complexity, and potential risk to cataract surgery, with no real benefits to offset those considerations." This statement is so reminiscent of the many myopic extracapsular cataract surgeons in the 1980s who blasted the emerging phaco technology. I find it difficult to comprehend how someone who has not used this cutting-edge technology can make such a statement.

I have been performing laser cataract surgery using the Catalys Precision Laser System (Abbott Medical Optics) for almost 1 year, and I cannot disagree with Dr. Safran more. True, laser cataract surgery adds minutes to the procedure, but the results are well worth it. It makes difficult cases routine, makes average surgeons excellent, and makes excellent surgeons superb. Capsulotomies are perfect; hard lenses are softened and easily removed with a fraction of ultrasound energy used in standard cases without laser assistance. This translates into eyes that are much quieter with better early postoperative vision. I agree that laser cataract surgery is more expensive to patients, but they get it; most are willing to pay for the added safety and results.

As the saying goes, don't knock it until you've tried it!

Dr. Silverman acknowledged no financial interest in the product or company he mentioned.

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Dr. Safran responds.

Dr. Silverman is not alone in feeling that, in his own hands, a femtosecond laser may offer benefits when performing cataract surgery. Regardless, one cannot charge Medicare and most insured patients extra for the use of a laser to perform covered steps in the cataract surgical procedure even if they are "willing to pay extra for the added safety and results."

I strongly disagree with his assertion that the laser makes excellent surgeons better. Published studies suggest that the opposite may be the case. Abell et al found that, even after the initial learning curve with the laser was complete, there was more than a 15 times higher anterior capsular tear-out rate with the use of a laser compared to their manual technique, and they attributed this to the "compromised capsulotomies" seen on scanning electron microscopy.¹ They found that the capsulorhexis created with all the modern lasers using the latest software looked more like a "micro can opener" with "postage stamp perforations and aberrant pits." Other investigators have confirmed these findings. Ostovic et al, in their microscopic analysis of laser capsulotomies, found, "The femtosecond laser-assisted capsulotomies also showed multiple tags, bridges, and stray impressions, even at some distance from the cutting edge. ...With increasing magnification, the edges of the femtosecond laser-assisted capsulotomies showed a sawtooth pattern with individual grooves on the cut edge. Tags were still clearly visible."²

Chang et al also reported a significantly higher radial anterior capsular tear-out rate (5.3%) with the laser as well as other complications and commented, "Based on this observation we suspect that femtosecond laser capsulotomy is weaker than manual [continuous curvilinear capsulorhexis]."³ Nagy et al found a 4% radial tear-out rate with an additional 20% capsular tags and bridges, 32% miosis, and 3% damage to the corneal endothelium due to direct laser damage.⁴ Chan et al found, in their study comparing laser and manual techniques, a 4.4% anterior capsular tear-out rate in the laser group versus 0% tear outs in the manual group. In addition, they reported that "two cases of significant anterior capsular

phimosis in the femtosecond laser cataract surgery group required surgical intervention.”⁵ Another study on white cataracts had an 8% radial tear-out rate. Out of 25 cases, “an adherent tongue-like capsule adhesion in nine eyes, and an incomplete capsulotomy button in three eyes” occurred.⁶

As a surgeon who currently has a radial anterior capsular tear-out rate of less than one per 1,000 cases, I would not look forward to facing the complication rates experienced in all of these studies. Furthermore, due to the nature of my practice, cataract cases with zonular instability and frank ectopia lentis are often referred to me. They require extensive manipulation of the anterior capsular edge with hooks, retractors, rings, and segments. A radial tear in such a case would be disastrous, and I believe that the risk of one would be much greater when manipulating a laser-created capsulorhexis, which looks more like a micro can opener than a smooth, continuous one created manually. I also believe that it would be much more difficult to clean the irregular

sawtooth edge of a laser-created capsulotomy of all lens epithelial cells than it is to wipe the smooth, continuous edge created by a manual tear. As a result, I feel that there will be more capsular contraction syndromes down the road in some of these patients.

As far as the benefit of the laser relative to its cost, a recent study concluded that, “even with generous assumptions for improvements in visual outcomes and reduction in complications rates over phaco cataract surgery, laser cataract surgery fails to reach the threshold of cost-effectiveness in current Australian or US dollars.”⁶ The authors added, “The assumptions of our model reflect our estimations of the potential of the technology that may or may not be realized. It is possible that the visual improvements seen with [laser cataract surgery] may be less than 5% (or even 0%) in a skilled surgeon’s hands, particularly with the use of premium IOLs. Our initial data demonstrated no improvements in visual acuity outcomes.”⁷ In other words, even if one assumed that the laser can provide benefits in terms of outcomes and reduced complications in cataract surgery that have not even yet been demonstrated, the use of the device would still not reach cost-effectiveness for patients.

What if surgeons are completely confident that they can manually create a capsulorhexis reproducibly and can dismantle a nucleus safely and efficiently with modern phaco chopping methods, and if they thus routinely experience crystal clear corneas the next day, even in eyes with the densest cataracts (www.youtube.com/watch?v=GIEcmeTmP5A)? Even if they could legally charge patients extra for the use of a laser to assist in these steps, why would the surgeons want to face the increased risk and expense of using one? ■

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