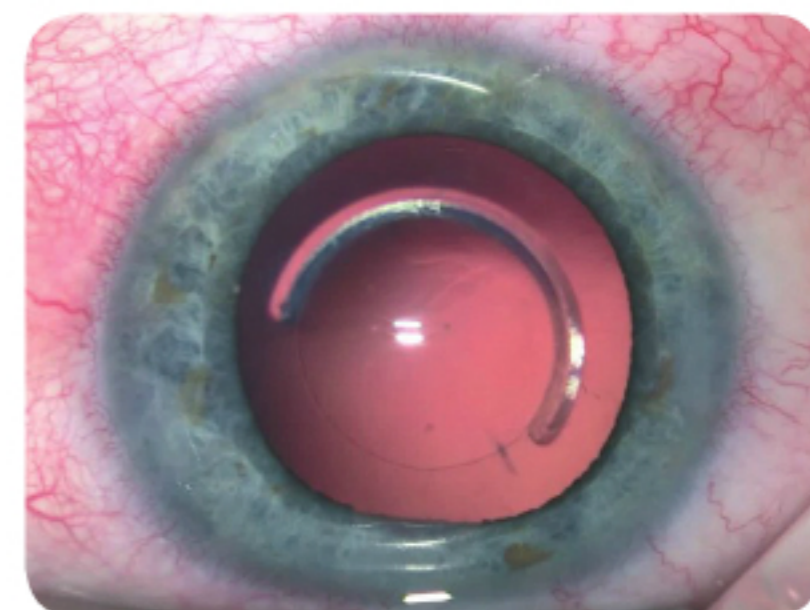


anterior capsulotomy

posterior capsulotomy

Capsulotomies yellow (left).
Corneal ring red reflex 1 (below)

Courtesy of Pavel Stodulka MD, PhD

INNOVATIONS

An ever-expanding range of indications for femtosecond lasers.

Roibeard O'hEineachain reports

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he Femtosecond laser systems used for cataract surgery are extremely versatile instruments and have numerous uses beyond those for which they were originally

designed. They can, therefore, come in very useful in some challenging cases, said Pavel Stodulka MD, PhD, Zlin, Czech Republic.

"These lasers are changing our daily practice in really amazing ways. In the future they may change things even more than we would like them to," Dr Stodulka said at the 18th ESCRS Winter Meeting in Ljubljana.

RING SEGMENTS NO BARRIER

One reason for the femtosecond laser's expanding range of indications is the shrinking range of contraindications for the devices in cataract surgery. For example, intracorneal ring segments might seem a logical contraindication for their use, since the laser energy must pass through the cornea. However, he noted that such is the precision of the femtosecond laser cataract systems that he and his associates have been able to successfully perform capsulorhexis and lens fragmentation with the devices in eyes with the intracorneal implants.

"When performing laser-assisted surgery in the presence of intracorneal ring segments we choose a smaller, 4.25mm diameter for the capsulotomy so that it will fit into the area defined by the inner edge of the corneal ring. In this way we achieve perfect alignment of the ring, the capsulotomy and the IOL," Dr Stodulka said.

Another new use to which Dr Stodulka and others have put the femtosecond

laser is the creation of posterior laser capsulotomy. He noted that the capsulotomies may be performed with the laser in eyes with or without IOLs. They can also be performed in eyes with silicone oil. In fact, capsulotomies created in this way can be used to remove the silicone oil in the course of a cataract procedure.

He noted that he has performed the procedure in several eyes using the Victus™ femtosecond laser (Bausch + Lomb). The laser has no difficulty reaching the depth of the posterior capsule and the system's high-contrast OCT provides accurate guidance for application of the laser energy. The laser easily cuts through the thick and elastic capsular tissue that is often present in eyes that have had silicone oil in their vitreous cavity for a long time.

Another novel technique for which Dr Stodulka has used the Victus femtosecond laser is corneal tattooing as a cosmetic treatment for leukocoria. He presented a video demonstration of the technique, which he carried out in the blind eye of a woman with leukocoria due to an old retinal detachment. The technique involves creating a corneal pocket in the cornea 5.0mm in diameter and at depth of 250 microns and injecting black tattoo dye to cover the white pupil. Dr Stodulka uses a diamond knife to create the entrance through which to inject the dye. He enlarges the incision with an instrument designed for the placement of intracorneal ring segments to inject the dye.

He noted that other more complicated and traumatic options for leukocoria include cataract surgery with implantation of a black IOL and implantation of a black anterior chamber IOL. Another, simpler option is the use of a coloured contact lens

with a black centre. However, the patient did not want to use a contact lens and Dr Stodulka therefore offered her the option of the novel cornea tattooing option.

"The cosmetic effect is quite nice and three or four months later the tattoo has not changed in any significant way and the patient is still quite happy with the results," Dr Stodulka said.

BRAVE NEW WORLD OF FEMTO

The range of indications for femtosecond lasers is likely to increase over the coming years, Dr Stodulka said. One possibility under investigation is the use of the laser to soften and restore the deformability of the lens in presbyopic eyes. The technique involves using laser to create a pattern of intralenticular microincisions, transforming the hardened lens into a system of gliding planes. Dr Stodulka said that among the innovations he would like to see in femtosecond cataract surgery technology is noncontact laser surgery with the type of 3-D eye tracker used in LASIK and PRK. A smaller suitcase-sized system would also be a helpful advance.

But what could really propel the femtosecond laser into more general use in cataract surgery is a better pricing structure. The current per-use fees are too high for most patients and most surgeons, he said.

"One possible future scenario we need to keep an eye on is robotic surgery. Already, automated structure-recognition is in place. If robots perform the manual part in the future that will make a significant impact on our practices," he added.

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