Femto cataract surgery

The most recent conferences of the ESCRS and ASCRS saw many presentations on potential uses of the femtosecond laser in various aspects of cataract surgery. These included the creation of clear corneal incisions, correction of astigmatism, creation of the capsulotomy, softening the lens nucleus, and even restoration of accommodation. Many questions on the efficacy, safety and economics of these new approaches still need to be addressed, notes JCRS co-editor Nick Mamalis MD in an editorial. Clinical issues will also need to be reported in the peer-reviewed journals. One such study looking at the performance of the continuous curvilinear capsulorhexis (CCC) appeared in the JCRS recently.


Femto capsulotomy

After preclinical work performing capsulotomies with an OCT-guided femtosecond laser in porcine and human cadaver eyes, researchers performed the same procedure in 39 patients as part of a prospective randomised study of femtosecond laser-assisted cataract surgery. The femtosecond laser-created capsulotomies were more precise in size and shape than manually created capsulorhexes, they report. In the patient eyes, the deviation from the intended diameter of the dissected capsule disk was 29 μm ± 26 (SD) for the laser technique and 337 ± 258 μm for the manual technique. The mean deviation from circularity was six per cent and 20 per cent, respectively. The centre of the laser capsulotomies was within 77 ± 47 μm of the intended position. All capsulotomies were complete, with no radial nicks or tears. The researchers also were able to assess the strength of laser capsulotomies in the porcine eyes. They found that the strength decreased with increasing pulse energy: 152 ± 21 mN for 3 μJ, 121 ± 16 mN for 6 μJ, and 113 ± 23 mN for 10 μJ. The strength of the manual capsulorhexes was 65 ± 21 mN. Even in the most experienced hands, an optimal capsulorhexis is not always achieved with the standard approach. Femtosecond lasers are able to create precise, customisable incisions in ocular tissue without collateral damage. The current study using the OCT-integrated femtosecond laser system allowed placement of cutting patterns in ocular tissue, allowing the surgeon to achieve a level of precision unattainable with manual and mechanical techniques.

N. Friedman et al., JCRS, “Femtosecond laser capsulotomy”, Volume 37, No. 7 1189-1198.

New diagnostic tool

Postoperative bacterial endophthalmitis requires prompt intervention. However, conventional microbiology techniques are time consuming and have low sensitivity. Brazilian researchers report that real-time polymerase chain reaction testing is useful in distinguishing between contamination and infection based on the cycle thresholds value. They evaluated 11 patients with infectious endophthalmitis, 12 control vitreous samples, and 50 control aqueous samples. Gram and culture identified 80 per cent and 75 per cent, respectively, of patients with infectious endophthalmitis. Real-time PCR assays were positive in 91 per cent of patients with a clinical diagnosis of endophthalmitis using aqueous samples, vitreous samples, or both. None of the 12 vitreous controls were positive by PCR. Two aqueous control samples were positive by real-time PCR. The cycle threshold cut-off value was 36 for universal PCR (sensitivity 93.8 per cent; specificity 100 per cent) and 38 for gram-specific PCR (sensitivity 93.8 per cent; specificity 100 per cent). Gram-positive microorganisms prevailed, and visual acuity varied according to the causative bacteria.

G Barreto Melo et al., JCRS, “Real-time polymerase chain reaction test to discriminate between contamination and intraocular infection after cataract surgery,” Volume 37, No. 7, 1244-1250.

KAMRA results

Four-year follow-up with the AcuFocus ACI-7000, now known as the KAMRA, intracorneal inlay suggest long-term safety and efficacy for the device. A study of 39 presbyopic patients aged 45-60 years showed lasting improvement in uncorrected near visual acuity, with most patients able to read J3 or better. Uncorrected distance acuity was 20/40 or better in all patients. Four inlays were explanted during the study. Reasons included refractive shift, thin flap and detection of a buttonhole flap. There were no severe corneal complications that affected final vision.


If I were having cataract and IOL surgery today, my choice of IOL would be . . .

Emanuel S. Rosen, MD, FRCSEd

Thomas F. Neuhann, MD

Richard B. Packard, MD

Douglas D. Koch, MD

Hiroko Bissen-Miyajima, MD

Gerd U. Auffarth, MD

FURTHER STUDY

Become a member of ESCRS to receive a copy of EuroTimes and JCRS journal