Femtosecond laser-assisted cataract surgery (FLCS) appears to be significantly less traumatic to the macula than conventional cataract surgery, according to the results of a comparative study presented at the 15th ESCR S Winter Meeting.

“Our results suggest that femtosecond laser cataract surgery may carry a reduced risk of macular oedema compared with conventional phacoemulsification surgery,” said Zoltan Nagy MD, Semmelweis University, Budapest, Hungary, the study’s principal investigator.

Dr Nagy noted that the results of several studies indicate that FLCS allows greater precision and safety in the creation of an anterior capsulorhexis than is possible with conventional techniques that employ a forceps or other instrumentation. The new technology also reduces significantly the amount of phaco time and phaco power needed to emulsify a lens.

“Reduction in ultrasound use, which has been associated with reduced postoperative complications, such as corneal oedema, endothelial cell loss, and corneal burn, may also potentially lower the incidence of postoperative macular oedema,” Dr Nagy said.

Reduced retinal thickening

In Dr Nagy’s prospective case-control study, 20 patients underwent conventional ultrasound phacoemulsification, and 20 patients underwent femtosecond-assisted cataract procedures.

The study’s primary outcomes were OCT retinal thickness in the central macula, the inner macular ring and the outer macular ring, and total macular volume. The study’s secondary outcomes were changes in retinal thickness at one week and one month postoperatively with respect to preoperative retinal thickness values, and effective phaco time and lens density.

In the femtosecond laser-assisted procedures Dr Nagy and his associates used a LensX femtosecond laser using the system’s integrated real-time OCT three-dimensional real-time video imaging to perform the capsulorhexis, the incision and lens photolysis. Following fragmentation by the femtosecond laser, they were able in most cases to remove the lens with a fraction of the phaco power usually required.

Dr Nagy noted that, after adjusting for age and preoperative thickness, a multivariable modelling of the effect of surgery on postoperative macular thickness showed significantly lower macular thickness in the inner retinal ring in the femtosecond group (p=0.002). In the control group, the inner macular ring was thicker than that of the femtosecond group by 21.68 µm at one week and by 17.56 µm at one month, which was only marginally significant, he said.

However, there were no significant differences between the thickness of the central and outer macula adjusted for age and preoperative thickness, Dr Nagy noted.

Dr Nagy pointed out that the differences between the macular thickness values of the two groups, although statistically significant, were not clinically significant. He nonetheless maintained that FLCS could make cataract procedures safer in certain groups of patients.

“This technology may be particularly advantageous for those who are at more risk for developing postoperative cystoid macular oedema, such as patients with uveitis or diabetic retinopathy.”

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