Implantable telescope offers hope to patients with severe AMD

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“We found statistically and clinically significant improvements in visual acuity. Although there is a trade-off in a slight loss of peripheral vision with this implant, for most patients this is more than compensated by the quality of life improvements as a result of improved visual acuity,” said Dr. Packer, assistant clinical professor of ophthalmology, Oregon Health Sciences University, Portland, Oregon.

Dr. Packer explained that the device, developed by Dr. Isaac Lischitz, is designed to provide magnification projected over a wide field of the retina, thereby improving central vision recognition for patients with severe AMD.

“It can genuinely be considered a breakthrough device as there is really not much we have to offer these patients who have macular scars or large atrophic areas other than low vision therapy in the form of external telescopes and optical aids,” he said.

Prospective trial

Dr. Packer presented results from a prospective open-label trial involving 217 patients enrolled in 28 centers in the US. Only patients over 55 years old with stable age-related macular degeneration, severe AMD and optimal rehabilitation commitment to achieve functional goals were considered for the implant.

“In order to be included in this study, it was absolutely necessary that patients have a clear corneal incision and no evidence of corneal or keratoconus,” he said.

Dr. Packer said that 206 out of 217 IMT devices were implanted successfully. Eight procedures had to be aborted, most of which occurred early in the surgeons’ learning curve, usually because of capsular tears. Intraoperative complications included two choroidal haemorrhages and one choroidal effusion due to the large incision size and the vulnerable state of the eye in that situation.

“Four cases in which the implant had to be removed postoperatively, two because of condensation in the microscope and one at the request of the patient.”

“We noted that the endothelial cell loss was higher in surgeons’ early learning curve cases and tended to be less of a problem with clear corneal incision than scleral tunnel incision”

Improved visual acuity in most eyes

The majority of patients (89%) reached the visual acuity efficacy endpoint at six months. Some 64% of patients improved by three or more Snellen lines of best-corrected distance visual acuity. Near best-corrected acuity also improved from 20/154 to 20/89, or 3.0 lines (p<0.0001).

“It is important to emphasise that these are people with macular scars or large areas of geographic atrophy, so to improve learning curve cases and tended to be less of a problem with clear corneal incision than scleral tunnel incision,” said Dr. Packer.

‘It was interesting looking at the data for the contralateral eye, which had standard cataract surgery with standard IOI implantation, as there was really no difference in terms of the endothelial cell loss. I think what we are seeing is really the standard amount of endothelial cell loss that you would expect in patients of this advanced age undergoing cataract surgery,” he said.

New improved design

Dr. Packer explained that the IMT-002 device used in the latest study has some important modifications from the first-generation model, including a shorter anterior/posterior length and a wider-angle view.

“Patients implanted with earlier versions of the IMT recognised a loss of peripheral vision as a major detriment of the implant, so innovations were made to widen the field of view,” said Dr. Packer.

In its latest form, the implant length is 3.6mm with rigid PMMA haptics and a glass cylindrical telescope that provides for 20 to 24-degree field of view.

Dr. Packer highlighted the importance of good surgical technique in achieving consistently good outcomes with the implant.

“There is a definite learning curve to be negotiated. Investigators overall felt that this was about three times more difficult a procedure than standard phacoemulsification. “

He also stressed that the good outcomes obtained owed a great deal to the multidisciplinary approach employed throughout the duration of the study.

“Large incision required

Implanting the device requires a large incision of between 10.0 to 12.0mm and a large capsulorhexis of about 7.0mm. After removal of the cataract through two micro incisions, Dr. Packer widening the incision between the microincisions using a sharp diamond blade. He advocates generous use of viscoelastics both in the eye and on the device to assist implantation.

He noted that about four sutures are usually required to close the incision, and based on his own clinical experience, surgeons can expect on average about 1.5D of surgically induced astigmatism in these patients after six months.

Dr. Packer said he performs a peripheral iridectomy after viscoelastic removal, followed by placement of the last suture and a final check to ensure watertight closure of the incision. Patients are then treated with topical steroids for four to six weeks, he said.

“‘It is vital to remember that this is not a cure for severe AMD and optimal outcomes require visual rehabilitation commitment to achieve functional goals’”

“There is quality of life improvement and clinically meaningful gains in visual acuity. Rigorous patient selection is critical to having realistic expectations, especially in terms of changes of peripheral vision. But on the whole, patients will gain from this implant and most said they were satisfied with the outcome. It is vital to remember that this is not a cure for severe AMD and optimal outcomes require visual rehabilitation commitment to achieve functional goals,” he said.

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