

Bilateral study

## IOLs both provide good results in head-to-head comparison

Aberration-free lens fares better in patient preference, dysphotopias cause fewer problems

By Lynda Charters  
Reviewed by Bjorn Johansson, MD

Linköping, Sweden—The Akreos Adapt Advanced Optics IOL (Bausch & Lomb) and the Tecnis Z9000 IOL (Advanced Medical Optics) both provided good visual acuity and contrast sensitivity when the two were compared head to head, according to Bjorn Johansson, MD.

However, twice as many patients preferred the Akreos IOL compared with the Tecnis IOL. Dysphotopias cause fewer problems in eyes with the Akreos IOL than in eyes with the Tecnis IOL. Maximal neutralization of higher-order aberrations did not prove to be necessary for good quality of vision.

Dr. Johansson and colleagues conducted a study at four clinical centers in which they

compared the visual acuity, contrast sensitivity, and level of induced higher-order aberrations of the two aspheric IOLs: the aberration-free Akreos hydrophilic acrylic IOL and the Tecnis Z9000 silicone IOL, which has been designed to produce negative aberration.



Dr. Johansson

Eighty patients with bilateral cataracts were included in the study; the patients received the Akreos one-piece IOL in one eye and the Tecnis silicone three-piece IOL in the fellow eye in a randomized fashion, Dr. Johansson explained. He is a senior consultant, Department of Ophthalmology, University Hospital of Linköping, Sweden.

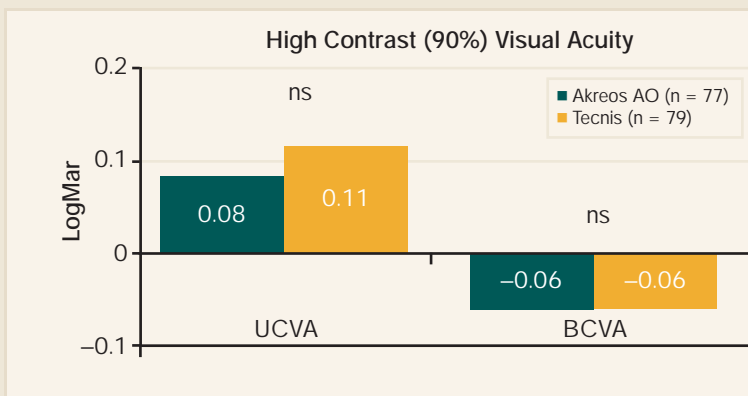
At the final follow-up examination 10 weeks after the surgery, the patients' visual acuity was tested with high- and low-contrast EDTRS charts. Contrast sensitivity was meas-

**IOL preference could be related to the degree of dysphotopsia, a better depth of field, or other factors.**

ured under mesopic and photopic conditions. Higher-order aberrations were measured with the ZyWave Wavefront Analyzer (Bausch & Lomb). Patients also filled out a questionnaire about their satisfaction with the postoperative visual quality, and they were unaware of which IOL was implanted in which eye.

"The visual acuity results did not differ significantly between the two IOLs with the high-contrast ETDRS chart or the low-contrast ETDRS chart. The photopic and mesopic contrast sensitivity functions were strikingly similar for the IOLs for any of the spatial frequencies," Dr. Johansson reported.

Figure 1 LogMar Visual Acuity



OT Graphic

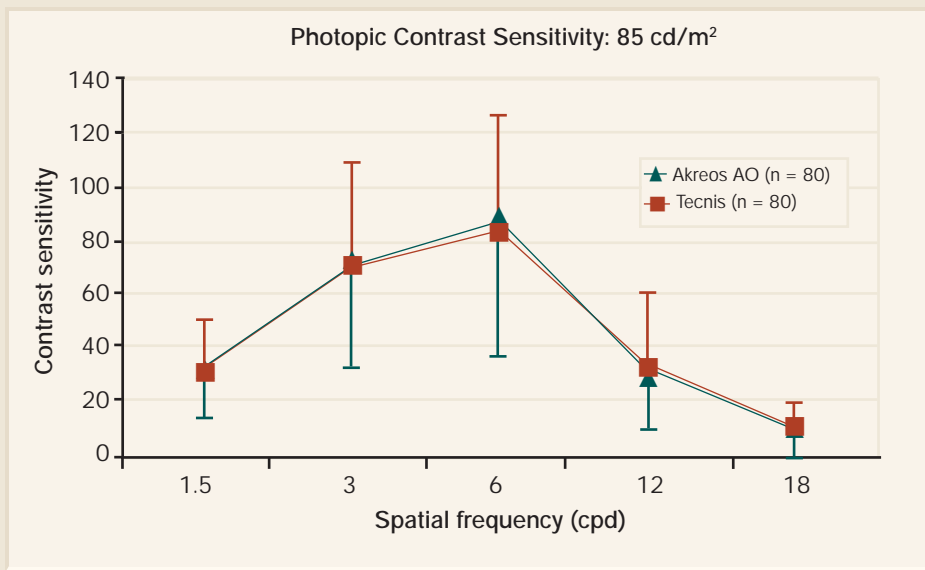
Ophthalmology Times / Source: Bjorn Johansson, MD

**Figure 1** LogMar visual acuity results measured at high contrast in patients who received the Akreos Adapt Advanced Optics IOL (Bausch & Lomb) and the Tecnis Z9000 IOL (Advanced Medical Optics).

### Take-Home Message

The Akreos Adapt Advanced Optics IOL (Bausch & Lomb) and the Tecnis Z9000 IOL (Advanced Medical Optics) both provided good visual acuity and contrast sensitivity when the two were compared head to head. However, twice as many patients preferred the Akreos IOL compared with the Tecnis IOL. Dysphotopias cause fewer problems in eyes with the Akreos IOL than in eyes with the Tecnis IOL. Maximal reduction of higher-order aberrations did not prove to be crucial for good quality of vision.

**Figure 2** Contact Sensitivity



OT Graphic

Ophthalmology Times / Source: Bjorn Johansson, MD

**Figure 2** Contrast sensitivity functions were similar for the Akreos Adapt Advanced Optics IOL (Bausch & Lomb) and the Tecnis Z9000 IOL (Advanced Medical Optics) at any of the spatial frequencies.

“There were slightly more higher-order aberrations in the eyes with the Akreos IOLs implanted compared with the eyes with the Tecnis IOLs implanted, which was expected. This is mainly due to the residual corneal spherical aberration,” he said.

Dr. Johansson demonstrated the corneal spherical aberration for pupil diameters of 4, 4.5, and 5 mm.

“The residual spherical aberration in the eye provides a potentially useful depth of field. The results indicate a significantly larger depth of field for the Akreos IOL, indicating the level of pseudoaccommodation,” he commented.

The patient questionnaire contained questions about dysphotopic symptoms

and to what extent the symptoms disturbed their vision during their activities of daily living and under certain lighting conditions. The patients who reported dysphotopic symptoms were asked which eye had more symptoms.

“We asked about overall satisfaction with distance vision and if the patients considered one eye to be better than the other. All patients except two, who were neutral, were satisfied or very satisfied with distance vision. No patient expressed dissatisfaction with distance vision. Twenty-eight percent of the patients considered the eye with the Akreos IOL to be the better eye compared with 14% of patients that favored the eye with the Tecnis IOL; 58%

reported that the two eyes were equal,” he said.

Fifty-five patients reported dysphotopsias, 33% had fewer problems with the Akreos IOL compared with 11% of patients who reported fewer problems with the Tecnis IOL; 56% reported equal symptoms in both eyes.

“Based on these results, we concluded that both IOLs provide equal and excellent visual acuity and contrast sensitivity results. The Tecnis IOL reduces higher-order aberrations better than the Akreos IOL. The calculated depth of field is better with the Akreos IOL.

“The patients were very satisfied with the outcomes of their surgery. Twice as many patients preferred the Akreos IOL compared with the Tecnis IOL. Dysphotopsias cause fewer problems in eyes with the Akreos IOL than in eyes with the Tecnis IOL.

“This study did not provide an answer to the question of what makes patients choose one IOL over

another. However, our data suggest that maximal reduction of higher-order aberrations is not a crucial factor. IOL preference could be related to the degree of dysphotopsia, a better depth of field, or other as yet unknown factors,” Dr. Johansson concluded. OT

FYI

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