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# Changes in higher order aberrations and contrast sensitivity after implantation of a phakic artisan intraocular lens.

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### Abstract

**PURPOSE:** To evaluate higher-order aberrations (HOAs) and contrast sensitivity (CS), and investigate their relationship after implantation of a phakic Artisan intraocular lens (IOL) for high myopia.

**METHODS:** A prospective study including 25 eyes of 15 patients with high myopia (greater than -8.00 D) who underwent phakic Artisan IOL implantation was carried out. Uncorrected visual acuity (UCVA), best corrected visual acuity (BCVA), refraction, and pupil diameter were measured at baseline and at 1 and 3 months postoperatively. HOAs were measured by Wavescan(R) (VISX Inc., Santa Clara, Calif., USA) from the 3.0 mm pupil entrance, and CS was measured by VCTS(R) 6500 (Vistech consultants, Inc., Dayton, Ohio, USA) under photopic conditions. The area under the contrast sensitivity function (AULCSF), defined as the integration of the fitted third order polynomial of the log CS units between the fixed limits of 0.18 (1.5 CPD) and 1.25 (18 CPD) on the log spatial frequency scale, was calculated.

**RESULTS:** UCVA LogMAR improved from 1.58 at baseline to 0.22 at 3 months, and spherical equivalent refraction improved from 0.77 +/- 0.34 D at baseline to 0.22 +/- 0.34 D at 3 months. The total HOAs had increased slightly at 1 month. CS had decreased significantly at 1 month ( $p < 0.05$ ), but returned to baseline values at 3 months. Postoperative AULCSF correlated with total HOAs under photopic conditions, but correlated with UCVA LogMAR at 1 month ( $p = 0.03$ ).

**CONCLUSIONS:** Phakic Artisan IOL implantation for the correction of high myopia resulted in a small increase in HOAs under photopic conditions. At 1 month, CS was decreased, but returned to baseline at 3 months under photopic conditions. Postoperative AULCSF did not correlate with total HOAs at 1 month.

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