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Randomized Controlled Trial [J Refract Surg.](#) 2021 Jul;37(7):460-465.

doi: 10.3928/1081597X-20210420-01. Epub 2021 Jul 1.

# Visual Performance of Two Diffractive Trifocal Intraocular Lenses: A Randomized Trial

[Julius Hienert](#), [Kristina Stjepanek](#), [Nino Hirschall](#), [Manuel Ruiss](#), [Hannah Zwickl](#), [Oliver Findl](#)PMID: 34236906 DOI: [10.3928/1081597X-20210420-01](#)

## Abstract

**Purpose:** To compare two trifocal intraocular lenses (IOLs), the RayOne Trifocal RAO603F IOL (closed-loop haptic IOL; Rayner Intraocular Lenses Limited) and the AT Lisa tri 839 MP IOL (plate-haptic IOL; Carl Zeiss Meditec AG), concerning optical and capsular bag performance.

**Methods:** Patients scheduled for cataract surgery received either a closed-loop haptic IOL or a plate-haptic IOL in the first eye and the other IOL in the second eye. Three months postoperatively, autorefractometry and subjective refraction, uncorrected and corrected distance visual acuity at 4 m, 80 cm, and 40 cm, an objective reading test (Salzburg Reading Desk; SRD Vision), a defocus curve, IOL tilt and decentration, a questionnaire about dysphotopsia, and grading of halos with a halometer were performed.

**Results:** Eighty-eight eyes of 44 patients were included. Visual acuity was comparable between both IOLs. The closed-loop haptic IOL performed better in the defocus curve at -1.50 diopters (D) ( $0.08 \pm 0.10$  vs  $0.12 \pm 0.09$  logMAR;  $P < .01$ ). The plate-haptic IOL had better contrast sensitivity without glare under mesopic and photopic conditions in miosis ( $P = .0018$  and  $.002$ , respectively) and mydriasis ( $P = .017$  and  $.003$ , respectively). Significant differences were found for less overall subjective disturbance ( $P = .047$ ) and starbursts ( $P = .039$ ) for the plate-haptic IOL, but not for the other positive dysphotopsia symptoms.

**Conclusions:** Both trifocal IOLs delivered good and comparable visual function with low degrees of disturbing dysphotopsia. The closed-loop haptic IOL was slightly superior in the defocus curve, whereas the plate-haptic IOL was slightly superior concerning contrast sensitivity and positive dysphotopsia. [*J Refract Surg.* 2021;37(7):460-465.].

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