A Prospective Study on Pseudophakic Mini-Mono Vision Using Monofocal Intraocular Lens

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Purpose

- Mini-monovision is a vision correction technique that allows for a broader spectrum of spectacle independence while minimizing anisometropia.
- This study aim to assess binocular spectacle independence for distance and intermediate vision and functionality of intermediate vision performance by reading speed after bilateral cataract surgery with mini-monovision (0.75 D difference).

Methods

- A prospective, non-randomised, single-arm cohort study on visual and optical outcomes after mini-monovision surgery, using Clareon monofocal intraocular lens (Alcon laboratories, USA).
- All patients underwent immediate sequential bilateral cataract surgery. The dominant eye was aimed for distance emmetropia, and the other eye for -0.75D. Patients were followed up at 1-month and 3-month.
- The primary outcome was binocular uncorrected intermediate visual acuity (UIVA).
- Secondary outcomes included monocular & binocular uncorrected (UDVA), best corrected distance visual acuity (BCDVA) at 4 meters and monocular UIVA.
- The tertiary outcomes were binocular target-corrected defocus curve (+1 to -2.50D in 0.50D steps), binocular target-corrected reading speed with Salzburg reading desk at 66cm and Catquest 9SF questionnaire preoperatively vs. postoperatively.

Results

- Twenty-seven patients were included.
- The primary outcome, binocular UIVA, at three-months was 0.1 ±0.13 LogMAR.
- Secondary outcomes included binocular and monocular UCDVA, which were -0.01 ±0.09 and 0.03 ±0.13 LogMAR at 1 month and -0.04 ±0.10 and 0.04 ±0.10 LogMAR at 3 months, respectively. Binocular CDVA was 0.05 ±0.09 and -0.05 ±0.04 LogMAR at 1 and 3 months respectively.

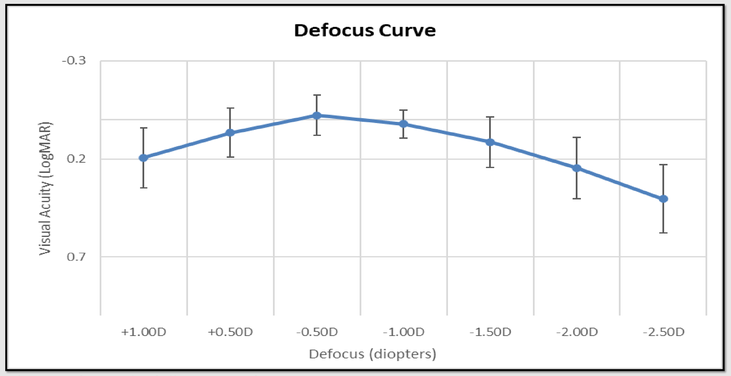


Figure 1. 3 months follow-up Defocus curve

- In the tertiary outcomes, the binocular defocus curve showed visual acuity of 0.1 LogMAR or better between -1.5 D and +0.5 D (Figure 1), Binocular uncorrected reading speed with Salzburg reading desk at 66 cm was 105 ±31.79 words per minute with 0.1 ±0.13 LogMAR.
- Analysis of the Catquest 9SF questionnaire using Rasch weighted scores found a statistically significant higher score postoperatively at 1 and 3 months, compared to the pre-op questionnaire ($p < 0.01$).

Conclusions

- In conclusion, immediate sequential bilateral cataract surgery with mini-monovision technique using Clareon® monofocal IOLs (-0.75 D offset) demonstrated favorable visual and functional outcomes.
- At three months, patients achieved excellent binocular intermediate and distance visual acuity. The defocus curve confirmed a broad range of functional vision together with good reading performance. Patient-reported outcomes reflected high satisfaction, as indicated by the Catquest 9SF scores. These findings highlight the effectiveness of this approach in providing excellent functional vision, ranging from distance to intermediate, and patient satisfaction.

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