Clinical Performance of Hanita Intensity Pentafocal Intraocular Lenses as a Treatment for Presbyopic Patients

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Objective

To investigate the clinical performance of the **Hanita Intensity pentafocal intraocular lens (IOL) implant** for treatment of **presbyopic** patients.

Introduction

- Presbyopia is highly prevalent with an estimated 1.8 billion presbyopes worldwide as of 2015 (1). It is the result of aging with worsened ability to accommodate the lens for near working distances (2). In a society with increasing amounts of near work and mobile use, there are benefits of maintaining visual acuity at both far and near viewing distances whilst maintaining spectacle independence (3).
- Traditional trifocal lenses have been used to correct presbyopia using concentric rings at differing ADD powers. This allows for maintained near, intermediate and distance vision. Yet, these lenses only cater to three distances and in some cases, have resulted in dissatisfaction with problems regarding dysphotopsia, contrast sensitivity and visual acuity (4).
- The Hanita Intensity lens is a pentafocal IOL with diffractive and spherical aberration adjustment (5). Using an iterative design method and multiple foci for light, this lens in theory offers better visual acuity for a wider range of distances and reduces Photic disturbances such as haloes.
- The amount of real life, clinical evidence on the Hanita Intensity lenses is limited (6-8). This study aims to investigate the clinical performance of the Hanita Intensity pentafocal intraocular lens implant for treatment of presbyopic patients in the UK.

Methods

Sample	• 50 eyes of the first 50 patients receiving this intervention
Preoperative Measurements	• Monocular visual acuity for distant (6m), intermediate (32 inches) and near (16 inches) recorded
Intervention	• Standard phacoemulsification surgery with intraocular lens implant using the Hanita Intensity Pentafocal IOLs
Postoperative Measurements	• Monocular visual acuity for distant (6m), intermediate (32 inches) and near (16 inches) recorded 3 months post-operatively

Results

- There were 19 male and 31 female patients in the study. Average patient age at the time of surgery was 58.4 years (range, 48-78 years). No patients were excluded from the study or lost to follow up.
- All surgeries were performed by the same surgeon.
- All surgeries were recorded as routine and uncomplicated operation.
- The average pre-operative SEQ was +0.87D (range, -10D to +5.25D) and the average post-operative SEQ was +0.04D (range, -0.5D to +0.375D).
- The uncorrected visual acuity improved at all distances post-operatively when compared to pre-operative visual acuities (Table 1).
- The visual acuities obtained are depicted in Fig. 1. For all measured distances, 100% of patients had a LogMAR of 0.20 or better after surgery. For Unaided Distant Visual Acuity (UDVA), 78% obtained a VA of 0.1 LogMAR or better. For UI (intermediate) VA, 66% achieved 0.1 LogMAR or better. For UN (near) VA, 88% achieved 0.1 LogMAR or better.
- No patients reported troublesome photic phenomena – glare, halos, contrast reduction & ghosting
- No post-operative complications were reported.

Pre Rx UDVA	Post Rx UDVA	Pre Rx UIVA	Post Rx UIVA	Pre Rx UNVA	Post Rx UNVA
0.57 (6/19-6/24)	0.08 (6/6-6/7.5)	0.37 (N16)	0.13 (N8)	0.36 (N20)	0.11 (N6)
Range 0 to 1	Range -0.1 to 0.2	Range 0.11 to 0.52	Range 0.1 to 0.22	Range 0.1 to 0.52	Range 0.07 to 0.22

Table 1: Shows the average preoperative (Pre Rx) and postoperative (Post Rx) uncorrected visual acuities in LogMAR for distant (UDVA), intermediate (UIVA) and near working distances (UNVA).

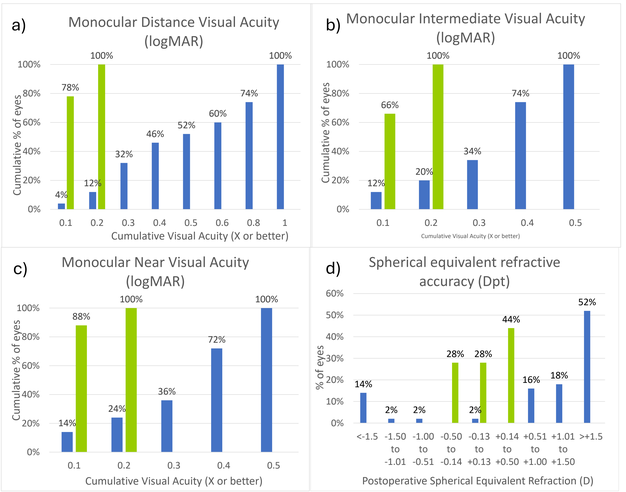


Fig. 1:. Graphs a,b and c show the cumulative monocular visual acuities in LogMAR for eyes preoperatively (Pre Rx) and postoperatively (Post Rx) at different distances. Graph d shows the spherical equivalent refraction in dioptres for eyes preoperatively (Pre Rx) and postoperatively (Post Rx)

Discussion

- The results demonstrate the success of the Hanita Intensity IOLs in improving visual acuity for all three viewing distances – near, intermediate and far. 100% of our cohort obtained a visual acuity of LogMAR 0.20 or better at all distances.
- This study corroborates and adds to the existing evidence on the performance of Hanita Intensity IOLs. (4 - 8).
- None of our patients reported troublesome photic symptoms, supporting evidence from other studies. The theoretical benefits of decreased photopic phenomena from a flattened defocus curve profile appears to be supported in our cohort (4, 5, 7, 8).

Limitations

- This study is limited by its small sample size.
- There is no head-to-head comparison between the Hanita Intensity IOLs and other multifocal IOLs in this cohort

No conflicts of interest to declare.

Key Takeaways

- This study builds on the evidence base demonstrating the effectivity of Hanita Intensity IOLs as a mutlifocal implant to allow for improved visual acuity at near, intermediate and far distances for patients having cataract/lens surgery
- The very low photic phenomena side effect profile is confirmed.

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