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# Visual and refractive results and patient satisfaction in presbyopic myopes and hyperopes after PresbyMAX® Symmetric multifocal ablation profile: Five-years follow-up.

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**Short title:** Refractive results five years following PresbyMAX®

**Abstract:**

**Purpose:** Assess visual and refractive results and patient satisfaction in presbyopic myopes and hyperopes after PresbyMAX® Symmetric multifocal ablation profile over a five-year period.

**Methods:** This retrospective study analyzed 82 eyes from 41 patients; 22 hyperopes and 19 myopes. All patients underwent PresbyMAX® Symmetric multifocal ablation profile. Patients were evaluated postoperatively after five years. A questionnaire was used to assess outcomes such as vision, glare, halos and overall satisfaction.

**Results:** Mean age during operation was 45±1.9 (41.8 to 50.2). After five years, the mean post-operative spherical equivalent was significantly higher in hyperopic patients (0.63 ±0.64; -0.62 to 1.75) compared to myopes (0.12 ±0.61; -0.75 to 1.13) (P=0.011). The mean post-operative UDVA and CDVA were significantly better among hyperopes (0.27 ±0.17; 0 to 0.6 and 0.13 ±0.11; 0 to 0.3 respectively) compared to myopes (0.39 ±0.14; 0.1 to 0.6 and 0.26 ±0.1; 0.1 to 0.4 respectively). There was no statistically significant difference in the safety index between hyperopes (0.99±0.06; 0.85 to 1.17) and myopes (0.99±0.06; 0.94 to 1.06) (P value 0.986) and in the efficacy index (0.9±0.08; 0.75 to 1.05)) and (0.92±0.08; 0.78 to 1.06)) respectively; (P = 0.750). The satisfaction analysis revealed that the mean overall satisfaction was 70% for both groups. Hyperopes had slightly better means for near vision, halos, glare, and night vision satisfaction while myopes were slightly better for distance vision satisfaction.

**Conclusion:** Aspheric PresbyMAX Symmetrical is a long-term safe and effective procedure for correction of presbyopia in myopes and hyperopes.

**Key words:** PresbyMAX, Presbyopia, PresbyLASIK, refractive surgery outcomes

## INTRODUCTION:

Presbyopia refers to an age-linked gradual process of defective accommodative capacity[1,2].

There are two approaches to correcting presbyopia: dynamic or static. The dynamic approach augments the remaining accommodative power, while the static approaches like PresbyLASIK, attempt to maximize the corneal depth of focus[3,4].

There are two PresbyLASIK approaches; peripheral PresbyLASIK and central PresbyLASIK[5-8]. PresbyMAX® is a central PresbyLASIK with three module updates: PresbyMAX Symmetric, Monocular (µ-Monovision), and Hybrid. All three modalities of PresbyMAX have been studied and binocular vision and stereo-acuity were found to be better in PresbyMAX Symmetric as compared to PresbyMAX Monocular and PresbyMAX-Hybrid[9-13]. This study analyzes refractive results and patient satisfaction in presbyopic myopes and hyperopes after PresbyMAX® Symmetric multifocal ablation over a five-year period.

## MATERIALS AND METHODS:

**Study Design:** A retrospective study that included 82 eyes of 41 patients; 22 hyperopes and 19 myopes.

**Ethical Consideration:** This study adhered to the Declaration of Helsinki guidelines. Written informed consent was collected from all participants before the surgery and before the questionnaire, given that all the study subjects were informed that all patients' data were kept confidential. This study was conducted in International Eye Hospital in Cairo Egypt.

**Inclusion criteria**: age > 40 years, Spherical Equivalent (SE) of −6 to +6 diopters (D), cylinder up to −3 D, Distance Corrected Near Visual Acuity (DCNVA) gains at least one line with addition, Corrected Distance Visual Acuity (CDVA) ≥ 0.4 (LogMAR) with tolerance to a minimum of -0.75 D, photopic pupil diameter smaller than 3.5 mm and mesopic pupil diameter larger than 4.5mm, suitable for LASIK and contact lens abandoned for at least two weeks before surgery.

**Exclusion criteria:** any ocular disease other than refractive error, previous ocular surgery or trauma, systemic illness, and binocular vision anomalies.

**Preoperative examination:** Visual acuity was tested using the decimal system (ETDRS chart) and was expressed in LogMAR for distance and LogRAD for near vision (at 33 cm). The binocular acuities included Uncorrected Distance Visual Acuity (UDVA), CDVA and DCNVA. Baseline examinations included measurement of manifest refraction, presbyopic addition, Pentacam for topographic data, pachymetry and photobic pupil size (Scheimpflug camera, Pentacam HR; Oculus Optikgerate GmbH, Heidelberg, Germany), pupillometry for mesopic pupil size.

**Surgical intervention:** All surgeries were performed by the same operator (AB) between December 2014 and August 2017 using the AMARIS flying spot scanning excimer laser (Schwind eye-tech solutions GmbH, Kleinostheim, Germany). LASIK flap was created with a Moria M2 microkeratome with 130 µm intended thickness (Moria, Antony, France). PresbyMAX® works on the principle of central PresbyLASIK through the creation of a bi-aspheric profile. The central zone is hyper-positive to offer near vision (-1.9D myopia), and gradual aspheric taper towards the periphery for distance (-0.4D). This means 1.5D increase in depth of focus[14]. The optical zone ablated was 6.0 mm, and the transient zone was 0.5 mm. The infra-red eye tracker was active. Centration of the ablation profile at the corneal vertex was done using pupillary offset measured with a topographer (Keratron Scout, Optikon, Rome, Italy), which approximates the visual axis.

**Postoperative Evaluation and Outcome:** Patients were examined postoperatively after one day, one week, one and three months, and then yearly up to five years after surgery. The results after five years were the target of this study. During the five-year examination, the main refractive and visual outcome measures included the Uncorrected Near Visual Acuity (UNVA), the safety index (post-op. CDVA / pre-op. CDVA), Efficacy index for distance vision (post-op. UDVA / pre-op. CDVA), predictability (post-op. Spherical Equivalent [SE] within ± 1 D) and the need for retreatment.

Satisfaction was subjectively assessed five years postoperatively using a questionnaire. The questionnaire covered the following symptoms: near vision, distance vision, glare and halos, night vision, dependency on glasses, and overall satisfaction regarding the surgery (Appendix 1). Each symptom was assessed from 0–100, with 0 representing the worst and 100 as the best[15]. Some clues were given to the patients regarding the halos and glare as regards to the degree to help them in their grading; if large and disturbing (<3), medium (4-6) and if small or very small (>7).

**Statistical methods:**

Data management and analysis were performed using Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). Numerical data were summarized using means and standard deviations or medians and/or ranges, when appropriate. Estimates of the frequency were done using the numbers and percentages, while Categorical data were summarized as numbers and percentages. Numerical data were explored for normality using Kolmogorov-Smirnov test and Shapiro-Wilk test. Chi square or Fisher's tests were used to compare between the independent groups with respect to categorical data, as

appropriate. One sample t test was done to compare test value in relation to target value. The student's t-test was used for comparisons between two groups for normally distributed numeric variables, while the Mann-Whitney test was used for non-normally distributed numeric variable comparisons. All tests were two tailed and Probability (p-value) ≤ 0.05 was considered significant.

**RESULTS**

In total, 82 eyes of 41 patients were included in this study: 22 (44 eyes) hyperopes and 19 (38 eyes) myopes. The hyperopic group included 12 males (54.5%) and 10 females (45.5%). The mean age at the time of surgery was 47±2 (43.7 to 50.5). The myopic group included 9 males (47.4%) and 10 females (52.6%). The mean age at the time of surgery was 45±1.9 (41.8 to 50.2).

The mean pre-op SE in hyperopes was 3.31 ±1.14 D (1.63 to 5.75), the mean pre-op. astigmatism (D) was -0.93 ±0.63 D (-2.5 to -0.25), and the mean addition power was 1.54 ± 0.74 D (0.5 to 2.5 D). The mean Pre-op. SE in myopes was -2.96 ±1.24 (-5.75 to -1.25), the mean pre-op. astigmatism (D) was -0.82 ±0.37 (-1.5 to -0.25), and the mean addition power was 1.43 ± 0.58 D (0.5 to 2.25 D).

The mean pre-op. binocular UDVA (Log MAR) in hyperopes was 0.62 ±0.16 (0.3 to 0.9), the mean pre-op. binocular CDVA (Log MAR) was 0.11 ±0.09 (0 to 0.3), and the mean pre-op. binocular DCNVA (Log RAD) was 0.56 ±0.16 (0.3 to 0.9).

The mean pre-op binocular UDVA (Log MAR) in myopes was 1.04 ±0.2 (0.8 to 1.3), the mean pre-op binocular CDVA (Log MAR) was 0.25 ±0.1 (0.1 to 0.4), and the mean pre-op. binocular DCNVA (Log RAD) was 0.59 ±0.13 (0.4 to 0.9).

The demographic and pre-operative data are summarized in ***Table 1.***

**Table 1:** Demographic and pre-operative refractive and visual Data.

| | **Hyperopes n=22 (%)** | **Myopes n=19 (%)** |
|---|---|---|
| **Female** | 10 (45.5%) | 10 (52.6%) |
| **Male** | 12 (54.5%) | 9 (47.4%) |
| | **Mean ± SD (range)** | **Mean ± SD (range)** |
| **Age** | 47±2 (43.7 to 50.5) | 45±1.9 (41.8 to 50.2) |
| **Pre-op. SE (D)** | 3.31 ±1.14 (1.63 to 5.75) | -2.96 ±1.24 (-5.75 to -1.25) |
| **Pre-op. Astigmatism (D)** | -0.93 ±0.63 (-2.5 to -0.25) | -0.82 ±0.37 (-1.5 to -0.25) |
| **The addition** | 1.54 ± 0.74 D (0.5 to 2.5 D) | 1.43 ± 0.58 D (0.5 to 2.25 D) |
| **Pre-op binocular UDVA (Log MAR)** | 0.62 ±0.16 (0.3 to 0.9) | 1.04 ±0.2 (0.8 to 1.3) |
| **Pre-op binocular CDVA (Log MAR)** | 0.11 ±0.09 (0 to 0.3) | 0.25 ±0.1 (0.1 to 0.4) |
| **Pre-op. binocular DCNVA (Log RAD)** | 0.56 ±0.16 (0.3 to 0.9) | 0.59 ±0.13 (0.4 to 0.9) |

SD: Standard deviation, SE: Spherical Equivalent, UDVA: Uncorrected Distance Visual Acuity, CDVA: Corrected Distance Visual Acuity, DCNVA: Distance Corrected Near Visual Acuity

With regards to the safety, all surgeries were uneventful, without any complications whether intraoperatively or postoperatively.

After five years, the mean post-operative spherical equivalent was significantly higher in hypermetropes (0.63 ±0.64; -0.62 to 1.75) compared to myopes (0.12 ±0.61; -0.75 to 1.13) (P value 0.011).

Meanwhile, there was no statistically significant difference in the mean post-operative astigmatism among hyperopes (-0.42 ±0.28, -0.75 to 0.25) and myopes (-0.34 ±0.21; -0.75 to 0) (P value 0.264).

However, the mean post-operative UDVA and CDVA were significantly better among hyperopes (0.27 ±0.17; 0 to 0.6 and 0.13 ±0.11; 0 to 0.3 respectively) compared to myopes (0.39

±0.14; 0.1 to 0.6 and 0.26 ±0.1; 0.1 to 0.4 respectively) (P value 0.020 & <0.001 respectively). Regarding CDVA and in the hyperopic group, only one patient (4.5%) lost one line, and another (4.5%) lost 2 lines. Meanwhile in the myopic group, seven patients (36.8%) lost one line each.

The mean post-operative UNVA was better than the mean pre-op. DCNVA in hyperopes (0.3 ±0.18; 0 to 0.7 compared to 0.56 ±0.16; 0.3 to 0.9) and myopes (0.42 ±0.19; 0.1 to 0.7 compared to 0.59 ±0.13; 0.4 to 0.9). The mean post-op. UNVA was slightly better in hyperopes, but the difference was statistically insignificant (P value 0.055). Regarding UNVA and in the hyperopic group, only two patients (9%) lost one line. Meanwhile in the myopic group, three patients (15.8%) lost one line each.

No statistically significant difference was demonstrated in terms of the safety index between hyperopes (0.99±0.06; 0.85 to 1.17) and myopes (0.99±0.06; 0.94 to 1.06) (P value 0.986). With regards to the efficacy, there was also no statistically significant difference in the efficacy index for distance vision between hyperopes (0.9±0.08; 0.75 to 1.05)) and myopes (0.92±0.08; 0.78 to 1.06)) (P = 0.750).

The results for post-operative SE, astigmatism, UDVA, CDVA, UNVA, safety index an Efficacy index are shown in **Table 2**.

**Table 2:** Refractive and visual Data 5 years after PresbyMAX® Symmetric

| | **Hyperopes** **Mean ± SD (range)** | **Myopes** **Mean ± SD (range)** | **P value** |
|---|---|---|---|
| **Post-op. SE (D)** | 0.63 ±0.64 (-0.62 to 1.75) | 0.12 ±0.61 (-0.75 to 1.13) | 0.011 |
| **Post-op. astigmatism (D)** | -0.42 ±0.28 (-0.75 to 0.25) | -0.34 ±0.21 (-0.75 to 0) | 0.264 |
| **Post-op binocular UDVA (Log MAR)** | 0.27 ±0.17 (0 to 0.6) | 0.39 ±0.14 (0.1 to 0.6) | 0.020 |
| **Post-op binocular CDVA (Log MAR)** | 0.13 ±0.11 (0 to 0.3) | 0.26 ±0.1 (0.1 to 0.4) | <0.001 |
| **Post-op. binocular UNVA (Log RAD)** | 0.3 ±0.18 (0 to 0.7) | 0.42 ±0.19 (0.1 to 0.7) | 0.055 |
| **Safety index** | 0.99±0.06 (0.85 to 1.17) | 0.99±0.06 (0.94 to 1.06) | 0.986 |
| **Efficacy index for distance** | 0.9±0.08 (0.75 to 1.05) | 0.92±0.08 (0.78 to 1.06) | 0.750 |

SD: Standard deviation, SE: Spherical Equivalent, UDVA: Uncorrected Distance Visual Acuity, CDVA: Corrected Distance Visual Acuity, UNVA: Uncorrected Near Visual Acuity, P value < 0.05 is considered significant.

The predictability of SE after five years is shown in **Table 3**; after five years 68.2% of hyperopes and 94.7 % of myopes were within ±1 D from target refraction (-0.4 D) and the difference was statistically significant in favor of the myopes (P value 0.05). In the remaining two groups, patients were within two diopters from the target refraction except one patient in the hyperopic group who exceeded two diopters.

**Table 3:** Predictability of Spherical Equivalent 5 years after PresbyMAX® Symmetric

| | **Hyperopes n=44 eyes (%)** | **Myopes n=38 eyes (%)** | **P value** |
|---|---|---|---|
| **SE within ±1 D from Target refraction (-.4 D)** | 30 (68.2) | 36 (94.7) | 0.050 |
| **SE > 1 D from target** | 14 (31.8) | 2 (5.3) | |

SE: Spherical Equivalent

In the hyperopic group, eight patients (36.4%) needed retreatment to adjust the distance vision in the form of aspheric myopic ablation. The right eye was adjusted in 3 patients

(13.6%), the left eye in 4 patients (18.2%) and one patient (4.5%) needed both eyes. The number was lower for myopic patients (five patients; 26.3%) who needed retreatment also for distant vision adjustment, 3 patients for the right eye (15.8%) and 2 patients for the left eye (10.5%). The difference between hyperopes and myopes was statistically insignificant (P value 0.524). Median time for retreatment was 1.8 years (range 0.5-3) in hyperopes, and one year (range 0.5-2) in myopes (**Table 4**). None of the patients in both groups needed reversal of treatment.

**Table 4:** Retreatment after PresbyMAX® Symmetric in hyperopes and myopes within 5 years

| **Retreatment** | **Hyperopes n=22 (%)** | **Myopes n=19 (%)** | **P value** |
|---|---|---|---|
| **Yes** | 8 (36.4) | 5 (26.3) | 0.524 |
| **No** | 14 (63.6) | 14 (73.7) | |
| **Right eye** | 3 (13.6) | 3 (15.8) | |
| **Left eye** | 4 (18.2) | 2 (10.5) | |
| **Both eyes** | 1 (4.5) | Non | |
| | **Median (range)** | **Median (range)** | |
| **Time of retreatment (Years)** | 1.8 (0.5-3) | 1 (0.5-2) | 0.232 |

P value < 0.05 is considered significant

The satisfaction analysis after five years via the questionnaire revealed that the mean patient satisfaction was 70% at five years after surgery for both hyperopes (70 ±20%; 30-90) and myopes (70 ±10%; 50-90). The hyperopes were slightly better with regards to the mean for near vision, halos, glare, and night vision satisfaction and the myopes were slightly better with regards to the distance vision but all were insignificant differences. Both groups showed similar satisfaction for dependency on glasses (Table 5). Special attention was given for the satisfaction in the retreated patients. Since the cause for retreatment was the unsatisfaction about distance vision, the mean distance vision satisfaction in retreated hyperopes was 76 ±16 (50 to 90) and in retreated myopes was 78 ±13 (60 to 90) and the difference was statistically insignificant (P =0.841). Also, the overall satisfaction in retreated hyperopes was 78 ±12 (60 to 90) and in retreated myopes 74 ±9 (60 to 80) and the difference was statistically insignificant as well (P =0.579).

**Table 5:** Satisfaction analysis 5 years after PresbyMAX® Symmetric

| | **Hyperopes Mean ±SD (range)** | **Myopes Mean ±SD (range)** | **P value** |
|---|---|---|---|
| **Near vision** | 70 ±20 (30-90) | 60 ±20 (30-90) | 0.333 |
| **Distant vision** | 70 ±20 (30-90) | 80 ±10 (50-90) | 0.565 |
| **Halos & glare** | 70 ±10 (40-90) | 60 ±10 (40-80) | 0.763 |
| **Night vision** | 70 ±10 (50-80) | 60 ±10 (40-80) | 0.016 |
| **Dependency on glasses** | 70 ±20 (10-90) | 70 ±20 (40-90) | 0.647 |
| **Overall satisfaction** | 70 ±20 (30-90) | 70 ±10 (50-90) | 0.787 |

P value < 0.05 is considered significant

**DISCUSSION:**

When planning for laser vision correction for presbyopia, good patient selection is crucial as creation of a multifocal profile in the cornea is associated with decrease in contrast, just like multifocal IOLs. The outcomes and satisfaction from PresbyLASIK procedures may vary according to the patients' age, occupation, requirement of near activity, patients' personality, and type of procedure done. Therefore, a thorough preoperative evaluation is mandatory and critical[9]. Mandatory inclusion criteria in our study were that the Distance Corrected Near Visual Acuity (DCNVA) gains at least one line with addition, Corrected Distance Visual Acuity (CDVA) ≥ 0.4 (LogMAR) with tolerance to a minimum of -0.75 D, photopic pupil diameter smaller than 3.5 mm and mesopic pupil diameter larger than 4.5mm and suitable for LASIK.

PresbyMAX (Schwind Eye-Tech-Solutions GmbH and Co., Kleinostheim, Germany) is a central PresbyLASIK with three module updates: PresbyMAX Symmetric, PresbyMAX Monocular (μ-Monovision) and PresbyMAX Hybrid. Currently, most PresbyLASIK procedures are performed as a

hybrid method with a combination of the actual multifocality principle of PresbyLASIK and monovision. While PresbyMAX Symmetric reported better outcomes with hyperopes and emmetropes, PresbyMAX hybrid provided better results with myopes than hyperopes[9,11,12,14,16]. The previous statement is confirmed by the results of our study. At 5 years after surgery, the mean UDVA and CDVA were significantly better among hyperopes (0.27 ±0.17; 0 to 0.6 and 0.13 ±0.11; 0 to 0.3 respectively) compared to myopes (0.39 ±0.14; 0.1 to 0.6 and 0.26 ±0.1; 0.1 to 0.4 respectively) (P value 0.020 & <0.001 respectively). The mean post-operative UNVA was slightly better in hyperopes, but the difference was statistically insignificant (P value 0.055). Nevertheless, both groups revealed an improvement in near vision even after five years. The mean post-operative UNVA was better than the mean pre-operative DCNVA in hyperopes (0.3 ±0.18; 0 to 0.7 compared to 0.56 ±0.16; 0.3 to 0.9) and myopes (0.42 ±0.19; 0.1 to 0.7 compared to 0.59 ±0.13; 0.4 to 0.9).

Baudu et al.,[14] studied 358 presbyopic myopes and hyperopes corrected with PresbyMAX Symmetric. After six months, they found binocular UDVA >20/25 in 70% of myopes and 74% of hyperopes and UNVA >J3 in 94% and 87%, respectively. They also reported 19% retreatment rate in both groups. In this study, the retreatment rate was higher as it was observed that eight hyperopes (36.4%) and five myopes (26.3%) needed retreatment, although the difference between the two groups was statistically insignificant (P value 0.524). Of note, none of the patients needed reversal of treatment.

Uthoff et al.,[11] evaluated PresbyMAX Symmetrical for hyperopia, emmetropia, and myopia. They reported UNVA of better than 0.3 LogRAD in 80% of hyperopes and myopes and 90% of emmetropes. UDVA of 0.1 LogMAR or better was reported in 83% of patients; 100% in hyperopes, 80% in emmetropes, and 70% in myopes, respectively. Loss of one line of CDVA was reported in 50% of hyperopes and emmetropes and 30% of myopes. Two or more lines of CDVA was lost in 10%, 10%, and 20% of hyperopic, emmetropic, and myopic patients, respectively.

In this study, regarding CDVA in the hyperopic group, only one patient (4.5%) lost one line, and another (4.5%) lost 2 lines. Meanwhile, in the myopic group, seven patients (36.8%) lost one line each. Regarding UNVA in the hyperopic group, only two patients (9%) lost one line, while in the myopic group three patients (15.8%) lost one line each. This is comparable to the results by Luger et al [12] which reported that 33% of patients had a drop in CDVA of at least one line, and 3% lost more than a line, whereas 23% patients lost a line or more of CNVA and 8% lost more than a line.

Villanueva et al.,[13] used a light propagation algorithm to assess the long-term stability of myopic or hyperopic corneas treated with PresbyMAX in 24 eyes using MATLAB software. Good stability of the multifocal ablation profile was reported three years after surgery. That was the first study to show the stability of outcomes of any PresbyLASIK procedure after three years. In this study and after five years, the stability was indicated by the safety index which was good in both groups with no statistically significant difference between hyperopes (0.99±0.06; 0.85 to 1.17) and myopes (0.99±0.06; 0.94 to 1.06) (P value 0.986).

Also, the efficacy index was assessed with no statistically significant difference for distance vision between hyperopes (0.9±0.08; 0.75 to 1.05)) and myopes (0.92±0.08; 0.78 to 1.06)) (P value 0.750). The fact that our study was five years' results may explain such relatively lower efficacy index.

Some previous PresbyLASIK studies had indicated that clinical outcomes of multifocal corneal ablation designs were less predictable[16,17]. Our results showed that predictability after five years was 68.2% of hyperopes and 94.7 % of myopes remaining within ±1 D from target refraction (-0.4 D). The difference was statistically significant in favor of the myopes (P value 0.05). The remaining patients in the two groups were within two diopters from the target refraction except for one patient in the hyperopic group who exceeded two diopters.

Fu D et al.,[18] examined the outcome and satisfaction of presbyopia correction using the PresbyMAX Monocular ablation profile after a one-year period. Their results revealed that overall patient satisfaction was 95.5% at three months after

surgery. After one year, satisfaction was observed to be 100%. At the post-op one year visit, 18.2% patients (4/22) had complained of decreased distance vision, while 13.6% patients (3/22) complained of impaired night vision quality. Three of their patients had suffered dry eye which was mild. [18] Since our study documents a longer post-operative duration, dry eye was not included in the questionnaire. Nevertheless, these results are in line with our findings regarding satisfaction analysis.

Even after five years patients still expressed a reasonable amount of satisfaction. In this study, the mean patient satisfaction was 70% for both hyperopes (70 ±20%; 30-90) and myopes (70 ±10%; 50-90). The hyperopes were slightly better with regards to near vision (70 ±20; 30-90 compared to 60 ±20; 30-90), halos and glare (70 ±10; 40-90 compared to 60 ±10; 40-80) and night vision satisfaction (70 ±10; 50-90 compared to 60 ±10; 40-80); while the myopes were slightly better with regards to the distance vision (80 ±10; 50-90 compared to 70 ±30; 30-90). Both groups showed similar satisfaction for dependency on glasses (70 ±20). Given the fact that all patients suffered from presbyopic symptoms before surgery and were complaining about their near vision abilities, the complaint of reduced near vision performance was relatively low five years after surgery.

The main limitation of this study was the relatively small sample size, but to follow up such patients for a longer duration was a recommendation of previous studies. This is the only study to follow up PresbyMAX Symmetrical patients for five years. Another limitation was that it included low to moderate myopia aged between 40-45 years at the start of the study and this relatively young presbyopes with somehow good performance for near vision may affect the results. Nevertheless, 40 to 45 years old people are still the most common population who may consider refractive corneal procedures for presbyopia in Egypt.

## CONCLUSION

In conclusion, the aspheric PresbyMAX Symmetrical is a safe and a relatively effective procedure for correction of presbyopia in both myopes and hyperopes. Good satisfaction was observed after five years of the procedure. It is of great importance to assess and manage patient expectations in presbyopia correction. Choosing patients with realistic expectations is mandatory. Also, the willingness to adapt is favored. There may be a decrease in UDVA for one or both eyes. There will be situations when the patient will see better with correction even after the surgery.

**Declarations:**

Financial support and sponsorship: The authors of this manuscript declare that they did not receive any form of funding from any governmental/ private sector/ non-governmental institution.

Data availability: Data of this research is all available within the manuscript. Any additional details or information regarding this research may be provided upon request.

Ethics Declarations: This research was conducted based on the guidelines of the declaration of Helsinki. An informed consent was provided by each of the subjects prior to inclusion in the study. This study was approved by the International Eye Hospital in Cairo Egypt ethics committee.

Conflict of Interest: No conflicting relationship exists for any author. The authors state that they have no proprietary interest in the products named in this article.

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