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A novel collaboration: Multifocal RGPs and low vision aids increase quality of life in visually impaired

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ABSTRACT

Objectives: By presenting 2 cases, this study aimed to discuss the utility of multifocal rigid gas permeable contact lenses in the low vision patient population, and their ability to decrease reliance on low vision aids and to increase quality of life.
Methods: A retrospective case series of 2 patients receiving care from two specialty practice locations was performed. Both patients were visually impaired presbyopic myopes, and sought care from both contact lens and low vision specialties in order to improve visual function and enhance their ability to perform activities of daily living. They were each fit with multifocal gas permeable contact lenses to be used in conjunction with low vision devices. The Visual Functioning Questionnaire – 25 was administered to both patients in order to quantify improvement to quality of life with the new contact lenses.
Results: Both patients were successfully fit with multifocal gas permeable contact lenses and reported decreased reliance on low vision aids as well as significant improvement in quality of life when wearing the contact lenses.
Conclusion: The use of multifocal rigid gas permeable contact lenses in the low vision patient population may be an effective tool to make visually impaired patients, particularly presbyopic degenerative myopes, less reliant on low vision aids, thereby improving their quality of life.

1. Introduction

Multifocal rigid gas permeable (MF RGP) contact lenses are an effective option for correcting presbyopic patients for distance and near [1,2]. One particular subset of patients for whom multifocal RGPs might provide substantial benefit are patients with low vision and a high refractive error that require an add. The currently available options for near correction in low vision patients include the use of low vision aids, such as magnifiers, prisms, colored filters and talking books, as well as telescopic contact lenses [3–5]. Although current low vision devices are associated with increased patient satisfaction, visual impairment correlates with the capacity to perform activities of daily living, and patients suffering from low vision do report the perception of impaired functional status and quality of life [6,7].

The use of contact lens correction for visually impaired patients has been described, including by means of monovision contact lens microscopes, in which a high powered near addition is prescribed for one eye in order to aid in near tasks [8–10]. There is, however, limited documentation available on the use of contact lenses in the presbyopic low vision population. Although multifocal RGPs with maximized adds may be a useful tool for visually impaired patients, to date, there are no reports of such lenses being utilized for near tasks in conjunction with low vision devices. This study reports on a case series of two visually impaired patients who were successfully fitted with multifocal RGP lenses and highlight the potential utility of such lenses in decreasing reliance on low vision aids, as well as in promoting increased quality of life in the low vision patient population.

2. Case reports

2.1. Patient 1

A 65-year-old female with a significant ocular history of high myopia and primary open angle glaucoma presented with poor vision in both eyes after multiple surgeries. In the left eye, the patient had a history of multiple retinal detachment repairs, a macular hole repair, a vitrectomy and cataract extraction. Current medications included 1 drop of Xalatan nightly and Timoptic twice daily in both eyes. The

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patient reported discontinuing treatment with Rhopressa several weeks prior in the right eye due to chronic conjunctivitis, but was using Tacrolimus ointment at the present visit to treat irritation of the ocular adnexa. Pertinent anterior segment findings were unremarkable in the left eye. On central 10-2 visual field testing, a complete superior temporal defect and partial inferior temporal defect were noted in the right eye, and a complete superior defect was noted in the left eye.

At the present visit, the patient expressed interest in trying alternative contact lenses. Refractive error was -20.00 -0.75 × 30 in the right eye and +0.50 -2.50 × 180 post-cataract extraction in the left eye. She was currently wearing a monofocal RGP contact lens in the right eye which left her significantly under-corrected, and no lens in the left eye. In this system, distance visual acuities were 20/125 in the right eye, which improved to 20/80 on pinhole, and 20/300 in the left eye, with no improvement on pinhole. Near visual acuities were 20/60 in both eyes. She was then fit into an International Contact Lens (ICL) aspheric gas permeable multifocal lens in her right eye, with parameters of: -16.25D, +4.00 add, 9.4 mm diameter, 8.4 mm optic zone and 0.13 mm center thickness. Initial lens selection was based on the adequate fit of her previous monofocal RGP contact lenses. The newly fit lens was observed to have a centered, lid attachment fit with adequate movement. Fluorescein staining revealed an evenly distributed alignment pattern. The BCVA obtained improved to $20/50^{+2}$ at distance in the right eye, and 20/30 in both eyes at near. Several low vision devices were fitted to be used in conjunction with the high add multifocal RGP, including a typoscope for general reading tasks, a +10D/3.5x illuminated hand magnifier for reading small labels and mail, a +8D/3x illuminated stand magnifier for reading poorly contrasted continuous text, +4.00D prism half eyes low vision spectacles for reading well contrasted continuous text, and a 2.8x hand held telescope for spotting street signs in the distance (Fig. 1).

The patient reported only using her low vision devices for particular functions, such as reading at near, reading street signs and watching performances, and she confirmed to be doing very well in this system. The patient became less reliant on her magnifier, a device she previously used to see poorly contrasted and very small continuous text, and was now able to read standard bold contrast text with the contact lenses alone. With the new lenses, the patient gained greater independence during activities such as shopping in the grocery store, preparing meals and writing checks. According to the National Eye Institute's Visual Functioning Questionnaire – 25 (VFQ-25) (Fig. 2), which was administered two months after the low vision device fitting, the patient's quality of life increased two-fold after she decreased her reliance on low vision devices and began to utilize them only for specific functions.

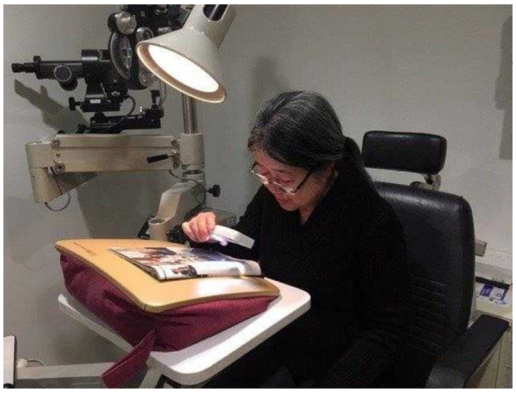

Fig. 1. Low vision patient utilizing increased add multifocal RGP lens in conjunction with a gooseneck lamp hand magnifier and reading glasses for near task.

No.	Items
1	General health
2	General vision
3	Worry about eyesight
4	Pain around eyes
5	Reading normal newsprint
6	Seeing well up close
7	Finding objects on crowded shelf
8	Street Signs
9	Going downstairs at night
10	Seeing objects off to the side
11	Seeing how people react
12	Matching clothes
13	Visiting others
14	Going out to movies/plays
15	Driving in daylight
16	Driving in difficult conditions
17	Accomplish less
18	Limited Endurance
19	Amount of time in pain
20	Stay home most of the time
21	Frustrated
22	No control
23	Rely too much on others' words
24	Need much help from others
25	Embarrassment

Fig. 2. Items measured with Visual Functioning Questionnaire – 25 to determine improvement in quality of life [11].

2.2. Patient 2

A 59-year-old male with an ocular history of bilateral degenerative high myopia, bilateral retinal detachment and scleral buckles in both eyes presented after a cataract extraction in the left eye. A nuclear sclerotic cataract of grade 3+ was also noted in the right eye, and the patient was considering a cataract extraction to improve visual acuity. The patient reported suffering from poor vision all of his life, and reported recent worsening of vision as well as diplopia in the absence of contact lens wear. The patient was wearing an RGP lens in the right eye, and had a history of RGP wear in the left eye. At the present visit, visual acuity in the right eye corrected with the RGP was 20/300- and pinhole to 20/150 for distance, and 20/200 for near. Uncorrected visual acuity in the left eye was 20/200-, pinhole to $20/125^{-1}$ in the distance, and 20/400 at near. Refractive error was −21.00 DS in the right eye and −0.50 −2.00 × 165 post cataract extraction in the left eye.

The patient was then fit with ICL MF RGPs with the following parameters: -22.00D, add +4.25, 7.55 mm base curve, 9.40 mm diameter, 0.13 mm center thickness, first peripheral curve 8.80 mm/0.30 mm, second peripheral curve 10.40 mm/0.20 mm in the right eye, and -2.25D, add +4.25, 7.55 mm base curve, 9.40 mm diameter, 0.20 mm center thickness, first peripheral curve 8.0 mm/0.30 mm, second peripheral curve 10.40 mm/0.20 mm in the left eye. Fit was observed to be centered with adequate movement and lid attachment, with a feathery apical touch pattern observed on fluorescein evaluation. Visual acuities with the new MF RGPs were 20/250 in the right eye and 20/200 in the left eye. The left eye was left moderately under corrected in the distance (-3.00D) to enable the patient to see large print on the computer at 13 in.

With these multifocal RGP lenses, the near visual acuity improved to 20/70 with both eyes. The patient reported being very happy with the use of his new contact lenses in conjunction with low vision devices, including a CCTV Clearview C and compact 7 HD. The patient felt that the MF RGPs enhanced his ability to carry out his daily activities. With the MF RGPs, the patient required less magnification on his computer,

allowing him to lower the zoom for seeing text, and decreased reliance on low vision aids when eating food and using his phone. Furthermore, the patient no longer required reading glasses for large print, as the contact lenses gave him “enough vision” to read large print at near. Although the patient continued to utilize his low vision devices, he felt that the addition of the MF RGPs improved his quality of life, as per the VFQ-25.

3. Discussion

This study reports on a series of two patients with significantly impaired vision that were successfully fit with high add multifocal rigid gas permeable lenses. Both patients are presbyopic degenerative myopes, and rely on the use of various low vision devices in order to accomplish activities of daily living. The goal of fitting these low vision patients with max add multifocal RGPs was to improve their quality of life (QOL) by decreasing reliance on low vision devices used for distance and near vision tasks. In order to determine relative improvement of quality of life, both patients completed the VFQ-25. Based on their responses, QOL increased nearly 100 % for distance and near activities as well as for general vision. In the other categories, such as social functioning, mental health, role difficulties and dependency, QOL nearly tripled.

In this case series, both patients required correction for high myopia, for which contact lenses are superior corrective choices due to their minimal impact on retinal image size, and subsequent minification, relative to spectacles. For the second patient, 20D of anisometropia was created following cataract extraction and subsequent implantation of a posterior chamber intraocular lens. In this case, contact lens correction was also optimal due to the lens’ ability to maintain aniseikonia at a minimal level given the high degree of anisometropia between the two eyes [12].

The use of multifocal RGP lenses in conjunction with low vision devices in the low vision patient population is a novel utility of contact lenses. Eye care practitioners caring for visually impaired patients, particularly presbyopic degenerative myopes, should consider using multifocal RGPs with a maximized add as a means of improving visual outcomes in such patients, decreasing reliance on visual aids, and improving quality of life as it relates to visual needs.

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