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Case Report

Scleral contact lens for severe keratoconus with corneal hydrops: A case report

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ABSTRACT

We describe a case of fitting a scleral contact lens for keratoconus management. A 37-year-old female has came for the keratoconus management opinion. She was using glasses for the last 20 years. She was presented with bilateral severe keratoconus with corneal hydrops, and it show high myopic. A standardized eye examination was thoroughly done in the hospital visual acuity, corneal oculyzer and slit lamp examination with IOP measurement. . The best spectacle corrected visual acuity was Right eye 6/60 with pinhole no improvement with the correction of -13.75/-2.00 x 35○ and Left eye having best spectacle corrected visual acuity of counting finger- finger counting with pinhole no improvement with the correction of -14.00 dsph. Optimal fitting characteristics were found in terms of vault, centration and landing and coverage the final parameter that we selected base curve, diameter, power and sag value RE 7.34, 16.40 mm, -15.25/-1.00 X 40^0, 5.41; LE 6.75, 16.40, -19.25/-1.50 X 110^0, 5.68 respectively. With over refraction of this power visual acuity was 6/6p and 6/9 in right eye and left eye respectively. In this case we were fit the patient with miniscleral lens which are more comfortable, and the visual acuity was also improved and in the follow up of 3 months no ocular adverse effects were seen. This case report shows that in this patient a Maxim Scleral Lens could be fitted successfully for keratoconus management, providing good visual quality.

1. Introduction

Keratoconus is one of the primary causes for the ectatic condition in the cornea. People of all sexes and races are affected by the keratoconus, which is most common in the second decade of life. According to epidemiological research, prevalence and incidence rates for keratoconus have been reported worldwide from 0.2 to 4,790 per 100,000 people and 1.5 to 25 per 100,000 people/year, with the highest overall prevalence rates often occurring among 20-30-year-olds.[1–3] Keratoconus is an asymmetric, bilateral, and progressive condition which led to irregular astigmatism and decreased the visual acuity.[4] In the case of mild to moderate cases of keratoconus, manage by rigid gas permeable contact lens (RGP) and masking the corneal irregularities with the tear lens. But RGP contact lens are always not helpful in those cases also because of the comfort and the intolerance by the patients, sometimes because of RGP the corneal erosions are happened recurrently and in results the quality of visual acuity becomes low. Corneo-scleral or scleral contact lenses are an option if corneal RGP lenses are not tolerated.[4] The primary use of miniscleral lenes are refractive correction of corneal ectasia or high ametropia, as well as the therapeutic treatment of chronic ocular surface illness.[5] These lenses showed therapeutic potential by successfully fitting the majority of patients whose corneas were deformed and who were intolerant to other kinds of vision correction such as piggyback, hybrid, or corneal gas permeable lenses.[5] We present a miniscleral contact lens fitting for the management of

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advance keratoconus with corneal hydrops.

2. Case Report

A 37-year-old female has come for the keratoconus management opinion. She was using glasses for the last 20 years. Her asthma was medically controlled for 10 years. There is no family history for keratoconus and about the allergic history she was not aware about any drugs.

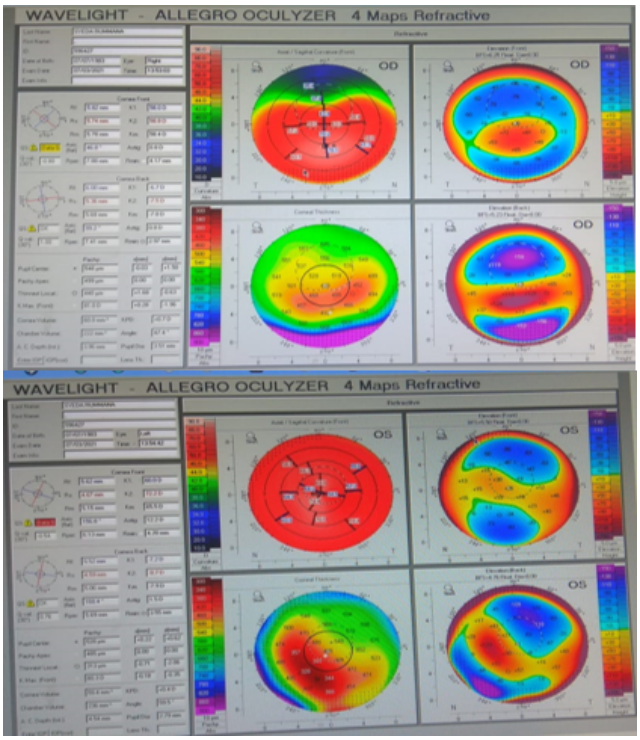

Figure 1: Shows right and left pentacam topographic patterns from the patient.

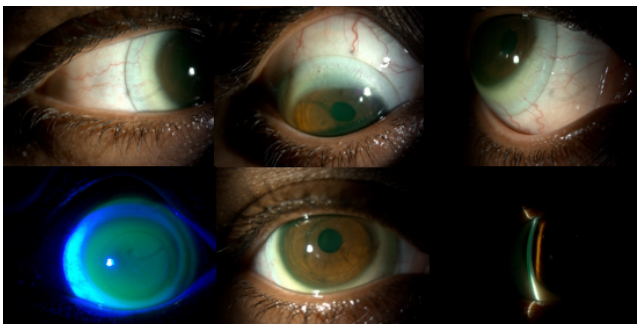

Figure 2: Shows the fitting patterns of the mini scleral contact lenses in the Right Eye, where shows there is no balncing, no impingment, 3600 landing zone and the valult of the contact lens.

Before the trial of contact lens, a through eye check-up was performed at MGM Eye Institute. This included objective and subjective refraction, slit lamp findings of ocular adnexa, Occulyzer Analyzer, and ocular fundus examination. The eye examinations show both eyes having Munson's sign and corneal hydrops with Vogt striae. The best spectacle corrected visual acuity was Right eye 6/60 with pinhole no improvement with the correction of -13.75/-2.00 x 35^0 and Left eye having best spectacle corrected visual acuity of counting finger- finger counting with pinhole no improvement with the correction of -14.00 dsph. Intraocular pressure was measured by Goldmann Applanation tonometer right eye 11 mmhg and left eye mmhg @ 1:40 pm. Topographic results showing the irregularities in the cornea of both eyes with the inferior steepening. The values of keratometry are RE K1 = 58.20 D (5.8 mm) and K2= 58.70 D (5.75 mm) astigmatism of 0.5 D, LE K1 = 60.70 D (5.56 mm) and K2 = 71.80 D (4.7 mm) astigmatism of 11.2 D. The thinnest local point of the cornea in RE 444 μm and LE 299 μm. These data confirmed the diagnosis of bilateral advanced keratoconus with corneal hydrops and both eye high myopic. The centre-near zone 1.5mm to 4.0 mm, its diameter ranges from 15.0 to 16.4 mm, its base curves ranges from 7.34 mm – 7.50 mm (0.05 mm steps). The SAG values come in 4.73 SAG, 5.41 SAG and 4.82 SAG. And the power ranges from -20.00 D to +20.00 D in 0.25 D steps. The visits were needed to fit with the Keracare Maxim. At the first visit, a diagnostic trial set was used in the fitting process, and the patient was assessed according to a standardised fitting methodology. The trial set are inserted into the eyes according to the keratometry readings and the diameter of the cornea by the corneal occulyzer report. The base curve is way much larger than we used in the trial lens but because the larger diameter and the SAG values of the lens we are fitted the patient with it. The trial lens parameters that are used, values are Base Curve RE 7.34 and LE 6.75, Power RE -5.00 D and LE -8.00 D, SAG values are RE 5.41 and LE 5.68 with the lens diameter of 16.4 mm. A sterile strip impregnated with sodium fluorescein which was moistened with one or two drops of saline solution, was applied touching the conjunctiva of the eye and instructed the patients to blink

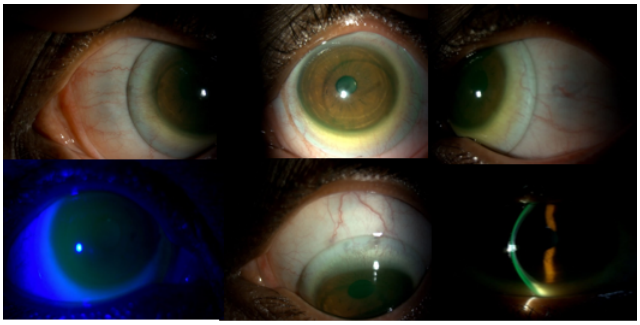

Figure 3: Shows the fitting patterns of the mini scleral contact lenses in the Light Eye, where shows there is no balncing, no impingment, 360^0 landing zone and the valult of the contact lens.

several times. Then the fitting pattern was assessed between the anterior segment of cornea and the posterior segment of the contact lens. The fitting pattern shows well centred, no movement of the lens, 360^0landing zone was ideal, no impingement and blanching are there, and overall fitting impression were acceptable fit. The vaulting of the right eye contact lens central – 250 μm, peripheral – 100 μm and for the left eye central – 200 μm, peripheral – 50 to 60 μm. After the over refraction of the patients RE -11.75/-1.00 x $40^0$and LE -13.00/-1.50 x 110^0.

The final parameters of the base curve, diameter, power and sag value RE 7.34, 16.40 mm, -15.25/-1.00 X 400, 5.41 ; LE 6.75, 16.40, -19.25/-1.50 X 1100, 5.68 respectively. The follow-up was performed at 3 months and 6 month. Visual acuity, comfort and prolonged use times were maintained while wearing the Keracare Maxima. In addition, no adverse ocular effects were found during this period.

3. Discussion

In the present case senario the patient who wrore miniscleral lenses are trial with corneo scleral lens also but there was limited range in this type of high myopia with advance keratoconus in both eye. In this case the comment that we were made that, the lens needed is toric lens of Keracare brand which was very useful in this type of high myopes. RGP contact lenses are considered an appropriate option to achieve optimal visual quality, masking the high irregular astigmatism.[6] Hybrid lenses are generally more expensive and do not normally provide better visual correction or wearing comfort than scleral contact lenses.[7] In this case we were fit the patient with miniscleral lens which are more comfortable and the visual acuity was also improved. With respect to scleral contact lenses, the patient initially preferred to try a corneo-scleral contact lens since these are easier to handle and insert in the eye than other types of scleral contact lenses.[8] In this case senario its not possible to dispence the corneo-scleral contact lens because of its high myopia and corneal hydrops. Also it is important to consider that excessive mechanical pressure on the limbal area should be avoided, since the stem cells are located in this area and are necessary for corneal health, by processing new epithelial cells which are distributed over the cornea.[9] Other alternative options, such as piggyback system, hybrid lenses or other types of corneo scleral lenses, could have been tried; however, the patient was satisfied with the Maxim Scleral Lense.

4. Conflicts of interest

The authors declare that there is no conflict of interest.

5. Source of funding

None.

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