

COMPARISON OF THE COMFORT OF BOSTON XO AND MENICON Z RIGID GAS-PERMEABLE CONTACT LENS MATERIALS IN KERATOCONUS PATIENTS

Umut Duygu Uzunel, Bora Yüksel, Tuncay Küsbeci

Izmir Bozyaka Training and Research Hospital, Department of Ophthalmology, Izmir, TURKEY

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INTRODUCTION

Keratoconus is a non-inflammatory ectatic thinning disorder of the cornea that results in poor vision because of irregular astigmatism.¹ Spectacles are useful in the early stages of keratoconus when the astigmatism is mild. With advanced keratoconus, spectacles play a very limited role and contact lenses become necessary for improving the vision and play a major role. Various options for contact lenses are available and one can use any one of these as a starting lens, depending on the severity of the cone and associated conditions.^{2,3}

The three important parameters in the fitting of any contact lens are diameter of the contact lens, the base curve (BC) and the power. Allowing an adaptation period of 30 min for the lens on the eye after insertion, both the dynamic and static fit should be assessed. As the name suggests, in dynamic fit, the lens fit is considered to be acceptable when the lens is centered on the cornea adequately during post-blink movements, good stability in different gazes and the patient is comfortable during all these movements. The movement should be not more than 1mm with every blink and the lens should not cross the limbus. The static fit is assessed after instilling fluorescein in the eye with cobalt blue filter with or without the Wratten filter.⁴

There are various materials and designs available for fitting these lenses such as traditional or customized lenses that are made locally (e.g., Material - Flouroperm 90, CLASSIC company, Bangalore, India), or Rose K lenses (Menicon Z material from Menicon Co., Ltd, Nagoya, Japan).⁴ Materials with high oxygen transmissibility should be selected to prevent hypoxia related corneal changes.

We aimed to evaluate and to compare to Boston XO or Menicon Z as a rigid-gas permeable (RGP) contact lens material in respect to ease of application, patient comfort and effect on visual acuity in keratoconus subjects.

MATERIALS AND METHODS

Eighty-four eyes of 84 keratoconus patients who have been followed up at Bozyaka Training and Research Hospital Contact Lens Department were included to this study. Boston XO (Orbiflex® / FlexCone®, SwissLens, Switzerland) was applied to 47 eyes and Menicon Z (Rose K2®, David Thomas Contact Lenses Ltd, Northampton, UK) was applied to 37 eyes. The 'three-point touch' fitting approach was used. Demographic features, best spectacle corrected visual acuities (BSCVA), keratometric readings, corneal topography, contact lens parameters, best contact lens corrected visual acuities (BCLCVA) and the number of trials to find the best fitting were noted. Patients were asked to score the comfort of the contact lens from 1 to 5 (1= not comfortable, 5=very comfortable) for each eye either 15 minutes after contact lens application and at the 6th month.

	Boston XO (n=47)	Menicon Z (n= 37)	p value
Sex (female:male)	16:12	13:10	0.964*
Age (years) mean±SD	33.1±13.3	30.9±7.3	0.482**
Mean follow-up time (months)±SD	9.8±2.4	9.9±3.5	0.864**
Keratoconus classification			0.325*
-mild (%)	5 (10.6%)	1 (2.7%)	
-moderate (%)	28 (59.6%)	24 (64.9%)	
-advanced (%)	14 (29.8%)	12 (32.4%)	
Mean keratometry (D) ±SD	49.9±3.9	50.4±3.8	0.535**
Mean central corneal thickness (µm) ±SD	438.5±41.6	440.2±35.8	0.842**
Mean spherical equivalent (D)	-6.12±4.15	-6.45±4.43	0.727**
Mean BSCVA (logMAR)	0.59±0.44	0.79±0.79	0.151**
Mean BCLCVA (logMAR) ±SD	0.06±0.10	0.06±0.11	0.986**

	Boston XO (n=47)	Menicon Z (n=37)	p value*
Mean number of trials ±SD	1.3±0.5	1.5±0.6	0.117
- one trial (% of patients)	35 (74.5%)	21 (56.8%)	
- two trials (% of patients)	11 (23.4%)	15 (40.5%)	
- three trials (% of patients)	1 (2.1%)	1 (2.7%)	
Mean lens comfort±SD	4.3±0.8	4.0±0.6	0.109
-5 (very comfortable) (% of patients)	25 (53.2%)	7 (18.9%)	
- 4 (comfortable) (% of patients)	19 (40.4%)	24 (64.9%)	
- 3 (tolerable) (% of patients)	4 (6.4%)	6 (16.2%)	
- 2 (less comfortable)	0	0	
- 1 (not comfortable)	0	0	

CONCLUSIONS

RGP contact lens is the best available management option for the visual rehabilitation in keratoconus.³ Improvement in contact lens design has decreased the number of patients who require penetrating keratoplasty.⁶ Ozkurt et al⁷ reported that there was a significant increase in visual acuity with Rose K lens (Material:Menicon Z) compare to best spectacle corrected visual acuity. In our study, we also observed that there was a significant increase in visual acuity with both Boston XO and Menicon Z lens compare to best spectacle corrected visual acuity.

A retrospective study that assessed the demographic profile of patients with Keratoconus reported the median age of presentation of the patients was 24 years (15-36 years).⁸ In our study, the average age of the patients was 33.1 years in Boston XO group and 30.9 years in Menicon Z group.

RGP contact lenses have a high success rate on keratoconus. The success rate of fitting Rose K lens in keratoconus was reported to be more than 90%.^{2,9} Mandathara et al, have shown similar results in 95% patients with an average number of trials being 1.73 (range: 1-5) and in 95% of the cases, the final fit was achieved within the first three trials.¹⁰ We achieved final fitting with a mean of 1.3 (1-3) trial in Boston XO group and with a mean of 1.5 (1-3) trial in Menicon Z group. In addition, we think that high correlation of BC on keratometric readings both of the groups and best fitting contact lens was shorten the duration of clinical examination.

Soft contact lenses (SCL) may be used in the early stages of keratoconus. SCL are known for comfort.¹⁰ Once the patient starts using SCL, then with the progression of the disease, it is difficult to tolerate rigid-gas permeable (RGP) contact lenses for the patient. So preferably RGP trial should be conducted as the first lens whenever possible. The main goal of fitting contact lenses is to improve visual acuity with comfort without compromising the health of the cornea. In our study, mean lens

comfort with Boston XO was 4.3 and with Menicon Z was 4.0 in comfort scale at the 6th months. We seen that both of the lenses were enough comfort.

In conclusion, our results suggest that Boston XO and Menicon Z contact lenses materials provide comparable improvement in visual acuity in cases of keratoconus. Boston XO and Menicon Z RGP contact lenses may be considered a good alternative for keratoconus patients in terms of high tolerance and patient comfort.

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