IMPORTANCE OF TEAR FILM IN FITTING OF RGP CONTACT LENS

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ABSTRACT:

This paper describes about Role of Tear Film in fitting of RGP Contact lens.

INTRODUCTION:

Tear film plays an important role during the fitting of Soft Contact lens and RGP Contact lens. But it is remembered that during Soft Contact lens fitting the thickness of the Tear Film/ Tear lens is very thin as compared to RGP Contact lens. (The meaning of the Tear lens is- When Contact lens is placed on the cornea

then underneath the contact lens the thickness of the Tear film is Tear Lens. In case of Soft Contact lens, the Tear lens is thin as compared to RGP Contact lens).

That's why movement of the RGP Contact lens on the cornea is considerable as compared to Soft Contact lens. So, during RGP Contact lens BOZR (Back Optic Zone Radius) plays an important role. If BOZR is changed in RGP Contact lens fitting then Contact lens Back Vertex Power is changed. That's why Contact lens and Corneal relationship is a very important factor for Contact lens fitting.

Here by the example describing about the Tear film role during RGP Contact lens fitting.

Before numerical always it is remembered:

**********mm/cam will be converted into meter

Suppose,

BOZR = 7.80 mm=0.0078 meter

^{n} tear = 1.336

^{n} Lens=1.490

Air = 1.000

So,

$$= (n'-n)/r$$

$$= (1.336 - 1.000)/0.0078$$

$$= 43.076 \text{ D}$$

If, BOZR is 0.05 mm flat then BOZR will be (7.80+0.05) =7.85 mm

$$= (n'-n)/r$$

$$= (1.336 - 1.000)/0.00785$$

$$= 42.830 \text{ D}$$

So, to change the BOZR 0.05 mm flat, the dioptric difference will be

$= [+42.803 - (+43.077)]$

= -0.274 D

If, BOZR is 0.05 mm steep, then BOZR will be (7.80-0.05) =7.75 mm

$$= (n'-n)/r$$

$$= (1.336 - 1.000)/0.00775$$

$$= 43.354 \text{ D}$$

So, to change the BOZR 0.05 mm steep, the dioptric difference will be

= [+43.354 – (+43.076)]

= +0.277 D

Thus, it has been proved that to change the BOZR during RGP fitting then back vertex power always will be changed.

RULE OF THUMB:

Change in 0.05 mm BOZR is equivalent to 0.25 D in Contact lens Back Vertex Power.

Here it has been showed that during RGP wear how Corneal Astigmatism is become neutralized by Tear Film

Before numerical always it is remembered:

********** mm/c.m will be converted into meter

Suppose K reading is

K1 = 8.00 mm=0.008 meter

K2 = 7.60 mm=0.760 meter

And

^{n} cornea = 1.376(when cornea is in air/ without Contact Lens)

^{n} tear =1.336(when cornea is with Contact Lens)

Here without RGP contact lens, Corneal Power is:

$$D_1 = (n'-n)/r$$

$$= (1.336 – 1.000)/0.008$$

$$= 47.00 \text{ D}$$

$$D_2 = (n'-n)/r$$
$$= (1.336 – 1.000)/0.0076$$

$$= 49.47 \text{ D}$$

So, Astigmatism is $(D_2-D_1) = (49.47 – 47.00)$ D=2.47 D

= 2.47 D

By this numerical it has been proved that if corneal astigmatism is present and without RGP wear the amount of astigmatic error will be= 2.47 D.

Here with RGP contact lens, Corneal Power is:

$$D_1 = (n'-n)/r$$

$$= (1.376 – 1.336)/0.008$$

$$= 5.00 \text{ D}$$

$$D_2 = (n'-n)/r$$

$$= (1.376 – 1.336)/0.008$$

$$= 5.26 \text{ D}$$

So, Astigmatism is $(D_2-D_1) = (5.26– 5.00)$ D=0.26 D

By this numerical it has been proved that if corneal astigmatism is present and with RGP wear the amount of astigmatic error will be= 0.26 D. So, this amount is not considerable.

So, during RGP contact wear the toricity of the cornea is neutralized by the Tear film.

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