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Contact Lens Fitting Considerations for a Patient with Vernal Keratoconjunctivitis

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BACKGROUND

Vernal Keratoconjunctivitis (VKC) is a form of allergic conjunctivitis that includes classic biomicroscopy signs of giant cobblestone papillae on the superior palpebral conjunctiva, trantas dots, and in severe cases, large corneal shield ulcers. Recurrent corneal ulcers may lead to corneal scarring causing an irregular corneal surface. This case describes considerations for contact lens fitting on an irregular cornea caused by complications from VKC.

CASE HISTORY

NS, 17 y/o Caucasian male, presented for specialty lens fitting due to poor vision through current spectacles. The patient was initially fit into scleral lenses, but upon further evaluation, neovascularization with surrounding haze was observed. The patient's corneal specialist also noted limbal stem cell deficiency (LSCD), which is commonly associated with VKC[1]. Due to these signs and the presence of LSCD, NS was refitted into corneal gas permeable (GP) lenses with piggybacks to reduce both mechanical stress on limbal stem cells and hypoxic stress.

PMHx:
Unremarkable

POHx:
VKC OU
Corneal scarring from previous shield ulcers OU (OD>OS)
LSCD secondary to VKC OU

POMHx:
Durezol BID OU
Restasis BID OU
Olopatadine QD OU
Preservative Free Artificial Tears (PFATs) PRN OU

PERTINENT FINDINGS

Presenting VAs through habitual Rx:
OD: 20/250
OS: 20/50-

Corneal findings:
OD: diffuse superior and central scarring and haze/ neovascularization at 11:00 extending 3mm with surrounding haze/ 6mm central diffuse scarring over pupil with 3mm focal scar superior temporal to pupil
OS: diffuse superior and central scarring and haze/ neovascularization superiorly with surrounding haze entering 3mm round scar temporal to pupil with another scar nasal

TREATMENT AND MANAGEMENT

VA through ScL:
OD: Unable due to inferior decentration
OS: Unable due to inferior decentration

Initial ScL fit:
OU: 250 microns central clearance/ adequate mid-peripheral clearance 360/ adequate limbal clearance 360 except touch superiorly/ good scleral alignment 360 except inferior blanching/ inferior decentration touching superior limbus

After initial ScL fitting, elected to refit NS into corneal GPs due to inferior decentration of ScL OU causing touch on limbus superiorly. Also switched due to haze and neovascularization.

Final Corneal GP Parameters:
OD: Optimum Comfort BC 40.50/ PWR +1.00DS/ OAD 9.4/ OZD 7.6/ SCR 10.00/ TCR 12.00x0.2/ CT 0.21
OS: Optimum Comfort BC 40.50/ PWR +1.00DS/ OAD 9.4/ OZD 7.6/ SCR 10.00/ TCR 12.00x0.2/ CT 0.21

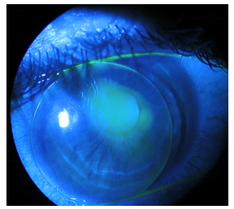

Fig 1. OD lens without piggyback

VA through Corneal GP:
OD: 20/30-2
OS: 20/20-2

Final Corneal GP fit:
OD: apical touch inferior temporal/ apical clearance centrally over scar central, ST/ decentered I/ edge lift S/ average peripheral clearance elsewhere/ movement over limbus
OS: apical touch central, SN, IT/ apical clearance over scar ST/ min-avg peripheral clearance S,I/ min peripheral clearance N,T

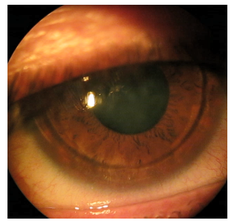

Fig 2. OD lens with piggyback

After multiple attempts to center the lens, a piggyback lens was utilized to center the corneal GP lens.

Piggyback Soft CL parameters:
OU: MyDay (8.4/14.2) +0.25DS

Piggyback Soft CL fit :
OU: 0.75 MOB/ good coverage/ centered

Corneal GP lenses with piggyback lenses centered over visual axis and able to prolong wear time from 2 to 10 hours a day with increased comfort. Discussed with NS to use medicated eye drops before and after lens wear. Educated NS to continue using PFATs PRN with lens wear. NS will return to clinic in 6 months to monitor corneal health with lenses.

DISCUSSION

- Vernal Keratoconjunctivitis may cause corneal ectasia, leading to distorted vision through soft CLs or spectacles. Therefore, rigid gas permeable lenses may be used to provide optimal vision for those with VKC induced corneal ectasia.
- The hypoxic nature of ScLs must be considered when neovascularization and haze already exist without lens wear[2]. ScLs create a barrier for oxygen diffusion due to the thickness of the lens and tear layer. ScLs also have little movement resulting in decreased tear exchange. Little to no oxygen to the cornea may result in further complications such as edema, neovascularization, or increased risk of infection[3].
- Corneal GP lenses allow for maximized oxygenation and prevention of further progression of neovascularization and haze[4]. Although neovascularization is likely due to inflammation from VKC, it is important to prevent further insult to the cornea. Corneal GP lenses also remove mechanical stress from the limbus, which is important in order to prevent worsening of LSCD[5].
- Piggyback lenses were utilized for increased centration and comfort. Due to the patient's history of VKC, using a daily lens is important in order to prevent buildup of allergens on the lens and exacerbation of the disease.
- Soft CLs have typically been found to aggravate LSCD, but other research has noted soft contact lenses may be used in cases of LSCD resulting from etiologies such as chronic hypoxia or mechanical rubbing from superior lid[5].
- Due to the concurrent LSCD, the goal is to transition NS to corneal GP wear without the piggyback lens.

CONCLUSION

- Factors to consider when choosing between corneal GP lenses and ScL in a VKC patient with concurrent LSCD include mechanical stress on the superior limbus if ScL decenters inferiorly on the eye as well as any indications of hypoxia on the cornea prior to fitting.
- When having difficulty fitting a corneal GP, piggyback with soft contact lens is an option to consider to aid in improving centration and increasing patient comfort.
- Further research is needed on effects of corneal GP or ScL on VKC and LSCD.

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