Oxervate (Cenegermin) treatment for persistent epithelial defects secondary to stage 2 neurotrophic keratopathy.

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Introduction

76-year-old Caucasian female is referred to our clinic for presumed nodular phlyctenular conjunctivitis OS that is resistant to Maxitrol TID for 7 days.

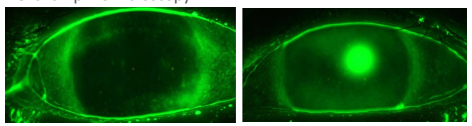
Patient reports mild foreign body sensation in left eye for over two weeks.

Medical History:
- **Type 2 Diabetes**
- Arthritis
- Hypertension
- Hypercholesteremia
- Hypothyroidism

Initial Encounter

Distance Visual Acuity with habitual glasses:
OD: 20/30
OS: 20/100
OU: 20/25

Slit Lamp Biomicroscopy:



Cochet Bonnet:
OD: 4 central, 3.5 inferior, 5.5 temporal, 6 nasal
OS: 4.5 central, 5.5 inferior, 5.5 temporal, 5.5 nasal

Differential Diagnosis: Persistent epithelial defect OS in patient with stage 2 neurotrophic keratitis OU.

Treatment: Inserted Prokera OS. Enrolled in Oxervate. RTC in 3 days for follow up.

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Second Encounter – 5 Days Later

CC: Mild discomfort from Prokera and blurry vision OS. Patient reports taping left eyelid closed to help with comfort.

Distance Visual Acuity with habitual glasses:
OD: 20/40
OS: N/A
OU: 20/25

Slit Lamp Biomicroscopy after removal of Prokera:
OD: 2+ SPK inferior half of cornea encroaching visual axis, 2+ EBMD
OS: dense coalesced 1+ SPK centrally, 3+ SPK inferior half of cornea encroaching visual axis, 3+ EBMD

Cochet Bonnet:
OD: 4 central, 3.5 inferior, 5.5 temporal, 6 nasal
OS: 4.5 central, 5.5 inferior, 6.0 temporal, 5.5 nasal

Treatment: Start Oxervate. RTC 4 weeks after starting Oxervate or sooner if any problems arise.

Four Week Oxervate Follow Up

CC: Eyes are very sore and there is a constant foreign body sensation. Vision seems to have improved. Patient reports consistently using Oxervate every two hours (6x/day) OU.

Distance Visual Acuity with habitual glasses:
OD: 20/30
OS: 20/25-
OU: 20/25+

Slit Lamp Biomicroscopy:
OD: 1+ diffuse conjunctival staining, 2+ SPK inferiorly, 1+ EBMD, TBUT 3 seconds, MGYLS 4, LWE 1x2, LOM severe, 2+ telangiectasia
OS: 1+ diffuse conjunctival staining, 1+ SPK inferiorly, 2+ EBMD, TBUT 2 seconds, MGYLS 3, LWE 1x2, LOM severe, 2+ telangiectasia

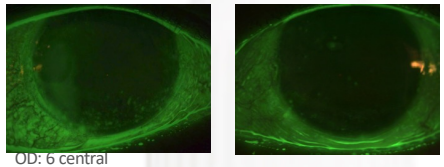
Treatment: Continue Oxervate for 4 more weeks. RTC 2 weeks after finishing Oxervate or sooner if any problems arise. Start using PF ATs prn after stopping Oxervate.

Oxervate Completion Follow Up

CC: Eyes feel more comfortable since stopping Oxervate. Patient reports "not being afraid to blink eyes or wake up in the mornings." Moderate foreign body sensation in both eyes. Using PF ATs TID OU.

Distance Visual Acuity with habitual glasses:
OD: 20/25+
OS: 20/25+
OU: 20/20-

Slit Lamp Biomicroscopy:



OD: 6 central
OS: 5.5 central

Treatment: Start Vital Tears QID OU and PF ATs prn OU. Recommend warm compresses 10 minutes 3-4 times per week.

Two Month Follow Up

CC: Eyes still feel "gritty", but it is manageable with Vital Tears QID OU and PF ATS prn (which patient reports is not very often). Patient reports also doing moist warm compresses 10 minutes everyday.

Distance Visual Acuity with habitual glasses:
OD: 20/20-
OS: 20/20-
OU: 20/20-

Slit lamp biomicroscopy is similar to previous visit.

Treatment: Continue Vital Tears QID OU, PF ATs prn OU, and warm compresses. Will consider a second round of Oxervate down the road if indicated. RTC 3 months for follow up.

Discussion

Neurotrophic keratitis (NK) is a degenerative disease of the cornea caused by decreased corneal sensitivity and poor corneal healing as a result of damage to the trigeminal nerve. Common etiologies of NK are herpetic keratitis, chemical burns, corneal surgery, chronic topical medications, chronic contact lens use, dry eye disease, diabetes mellitus, limbal stem cell deficiency, and several others.[1]

Cenegermin 0.002% (Oxervate) is a recombinant human neurotrophic growth factor (rnNGF) produced in Escherichia coli.[2] Approved dosing of Oxervate is six times a day for eight weeks. Oxervate has been shown to facilitate corneal healing[2], regenerate corneal nerves[3], and increase corneal sensitivity.[3] Prior to rnNGF for NK, treatment involved preservative-free artificial tears, bandage contact lenses, and autologous serum drops,[3] in mild cases, and tarsorrhaphy and amniotic membrane transplantation,[3] in severe cases. Treatment was, and still is, mostly focused on healing the damage caused by the disease and attempting to prevent further damage with little success.

Oxervate gives practitioners the opportunity to increase the quality of life of patients with NK. In this case, Oxervate used in combination with amniotic membrane and serum eye drops improved corneal healing and increased corneal sensation. Reducing the severity of NK increases the eye's ability to heal itself, which means fewer punctate keratitis, persistent epithelial defects, and corneal ulcers for our patients with neurotrophic keratitis.

References

1. Epitropoulos, Alice T., and Jamie L. Weiss. "Topical Human Recombinant Nerve Growth Factor for Stage 1 Neurotrophic Keratitis: Retrospective Case Series of Cenegermin Treatment." American Journal of Ophthalmology Case Reports, vol. 27, Sept. 2022, p. 101649. DOI.org (Crossref), https://doi.org/10.1016/j.ajoc.2022.101649.
2. Pflugfelder, Stephen C., et al. "Topical Recombinant Human Nerve Growth Factor (Cenegermin) for Neurotrophic Keratopathy." Ophthalmology, vol. 127, no. 1, Jan. 2020, pp. 14–26. DOI.org (Crossref), https://doi.org/10.1016/j.ophtha.2019.08.020.
3. Pedrotti, Emilio, et al. "Eight Months Follow-up of Corneal Nerves and Sensitivity after Treatment with Cenegermin for Neurotrophic Keratopathy." Orphanet Journal of Rare Diseases, vol. 17, no. 1, Dec. 2022, p. 63. DOI.org (Crossref), https://doi.org/10.1186/s13023-022-02237-5.

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