Neurotrophic Keratopathy Following Pars Plana Vitrectomy & Indirect Ophthalmoscopic Laser

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INTRODUCTION

- Neurotrophic Keratopathy refers to changes in the corneal epithelium from diminished or absent corneal sensation.
- Findings range from punctate epithelial keratitis to corneal ulceration and/or perforation.
- Management is challenging often with a slow and incomplete recovery.
- Sequelae include scarring, irregular astigmatism, and loss of vision.

INTRODUCTION

- Early recognition and prompt treatment is a primary goal to help lessen these poor outcomes.
- This can be facilitated by knowledge of associated risk factors.
- Traditional risk factors for neurotrophic keratopathy include herpetic keratitis, diabetes, corneal surgery, eye drops, cranial surgery.
- However, roughly 1 in 7 cases of neurotrophic keratopathy have no known risk factors.

PURPOSE

- To identify and analyze a series of neurotrophic keratopathy patients to determine if non-traditional risk factors can be identified.

Methods

- Retrospective chart review of consecutive patients identified through an EHR search of ICD-9 370.35: neurotrophic keratoconjunctivitis from 01/01/2007 to 03/16/2012.
- Inclusion criteria: diagnosis of neurotrophic keratopathy (by cotton tip wisp and/or exam findings), age > 18 years, follow-up greater than 1 day.
- Charts abstracted for age, sex, race, traditional risk factors, treatment modalities, initial and final visual acuity and length of follow-up.

METHODS

- Descriptive statistics generated for demographic and clinical characteristics. Variables compared when appropriate by student t-test.
- Patients analyzed in total as Group findings and separately according to Traditional Risk Factors.

RESULTS

- 17 patients identified, 1 excluded secondary to no follow-up. Analysis based on 19 eyes from 16 patients.
- Corneal sensation diminished or absent in 17 of 19 eyes (2 eyes no comment in chart).

TABLE 1. Group Findings of all Patients.	
Gender	7 males, 9 females
Race	All White
Age (years)*	57.84 (+/- 18.09)
% Eyes with Risk Factors	73.68% (14/19 eyes)
Number of Risk Factors*	1.05 (+/-0.73)
Number of Treatments*	3.16 (+/- 1.12)
BCVA initial*	LogMar 0.97 +/- 0.61 (20/200)
BCVA final*	LogMar 0.66 +/- 0.73 (20/90)
Follow Up (months)*	28.96 (+/- 33.12)

*Average

TABLE 2. Traditional Risk Factors for Neurotrophic Keratopathy

Number of Eyes with Traditional Risk Factors	14 eyes of 12 patients (74%)
Frequency of Traditional Risk Factors*	1. Diabetes – 38.5% 2. LASIK– 26.3% 3. HZO – 15.8% 4. Superficial keratectomy - 10.5% 5. Penetrating keratoplasty – 10.5% 6. Cranial Surgery – 10.5%
Number of Eyes with No Risk Factors	5 eyes of 4 patients (26%)
Proposed Risk Factor Common to Patients with No Risk Factors	All had pars plana vitrectomy and IDOL photocoagulation within 6 months of presentation.

* Some eyes had more than 1 risk factor

TABLE 3. Patients Analyzed in Subgroups According to History of Pars Plana Vitrectomy and Indirect Ophthalmoscopic Laser.

	No PPV/IDOL	PPV/IDOL	pValue
Number	8 eyes from 7 patients	11 eyes from 9 patients	-
Age*	62.43 (+/- 22.46)	58.33 (+/- 13.82)	0.93
Sex	2 males, 5 females	5 males, 4 females	-
Race	7 Caucasian	9 Caucasian	-
Risk Factors*	1.38 (+/- 0.74)	0.82 (+/- 0.98)	0.20
Treatments*	2.91 (+/- 1.14)	3.50 (+/-1.07)	0.27
BCVA initial*	logMAR 0.79 (20/120)	LogMAR 1.1 (20/300)	0.34
BCVA final*	LogMAR 0.92 (20/160)	LogMAR 0.48 (20/60)	0.20
Follow Up (months)*	42.2 (+/- 39.44)	19.3 mos (+/- 25.33)	0.14

* Average

Conclusions

- Our study suggests pars plana vitrectomy and IDOL may be an unrecognized risk factor or cause of neurotrophic keratopathy.
- The mechanism of injury may be laser and/or trochar induced damage to the long and/or short ciliary nerves that provide sensation to the cornea.
- Clinicians should be aware of possible neurotrophic corneal defects after pars plana vitrectomy with IDOL.

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