Idiopathic Corneal Warpage Documented By Corneal Topography and OCT Epithelial Maps

Priscilla Q. Vu, MD, MS; Yan Li, PhD; David Huang, MD, PhD

Casey Eye Institute, Oregon Heath & Science University

Portland, Oregon, USA

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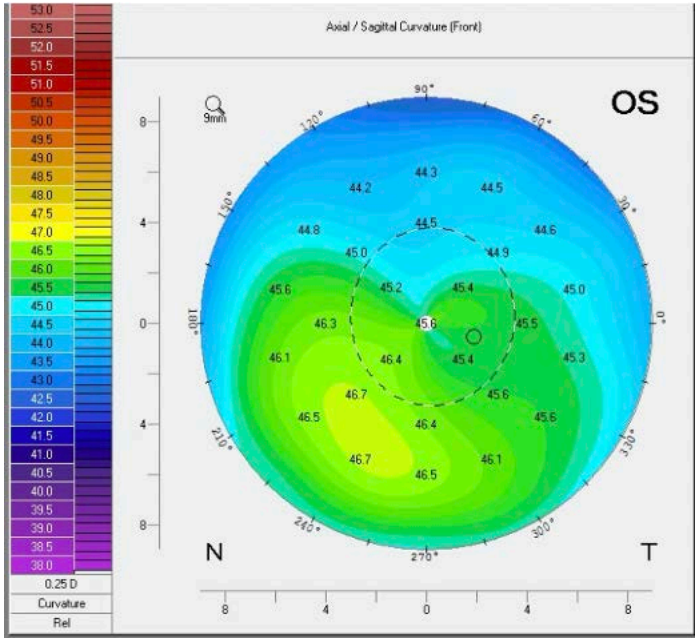
Purpose

Inferior steepening on topography can be indicative of:

- Corneal ectasia (i.e. keratoconus) - focal steepening and decreased pachymetry, with associated overlying epithelial thinning
- Contact-lens related corneal warpage - focal steepening with normal pachymetry, but associated overlying epithelial thickening
- **<u>Idiopathic corneal warpage</u>** - this study aims to describe this new clinical entity



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Methods

Retrospective case series

Inclusion Criteria:

- No history of recent contact lens wear within 3 months
- Corneal and epithelial thickness maps
    - Spectral-domain optical coherence tomography (OCT) (Avanti, Optovue, Fremont, CA)
- Topography maps
    - Scheimpflug tomography (Pentacam HR, Oculus, Arlington, WA) OR
    - Placido scanning-slit topography (Orbscan II, Bausch & Lomb, Rochester, NY).

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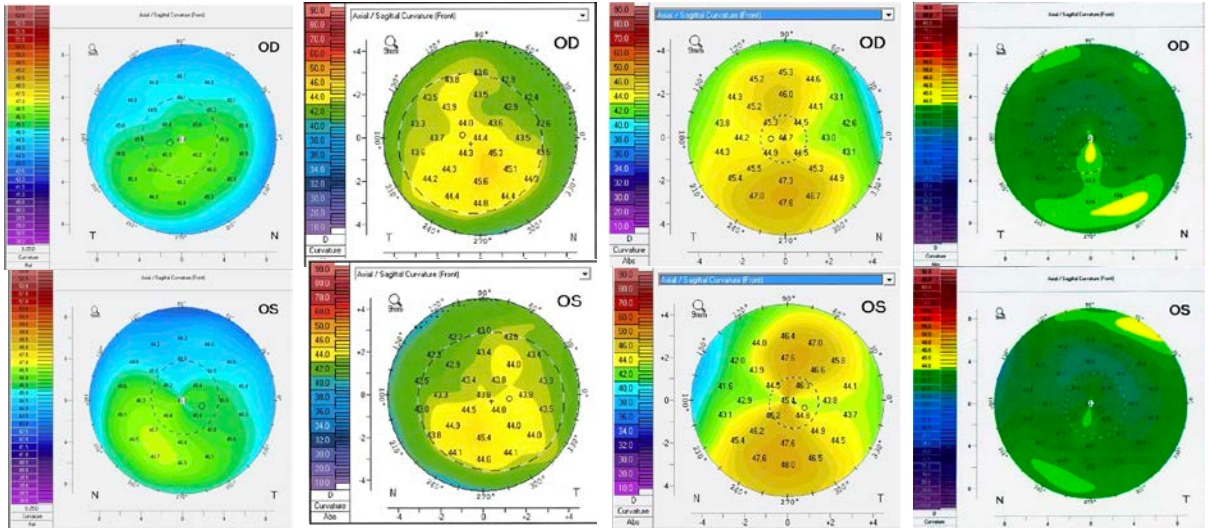
Results

- 8 eyes of 4 patients with focal inferior steepening
  - Six eyes had no history of contact lens wear
  - Two eyes had not worn contact lens for at least 3 months
  - Two eyes had previous LASIK
- Ectasia and ocular surface disease ruled out as underlying etiology



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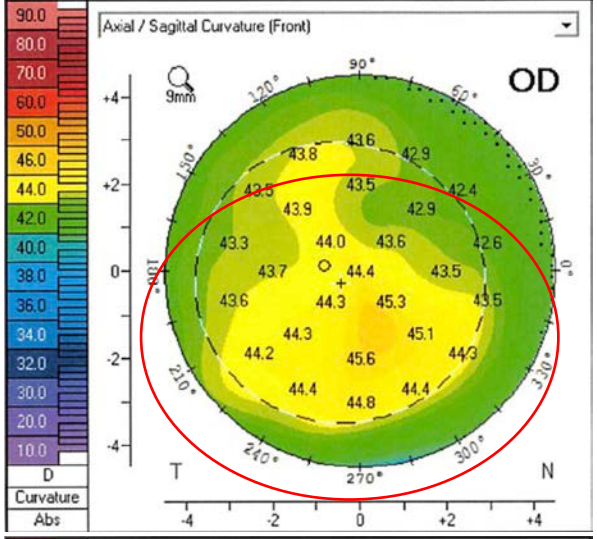
Axial / Sagittal Curvature (Front)
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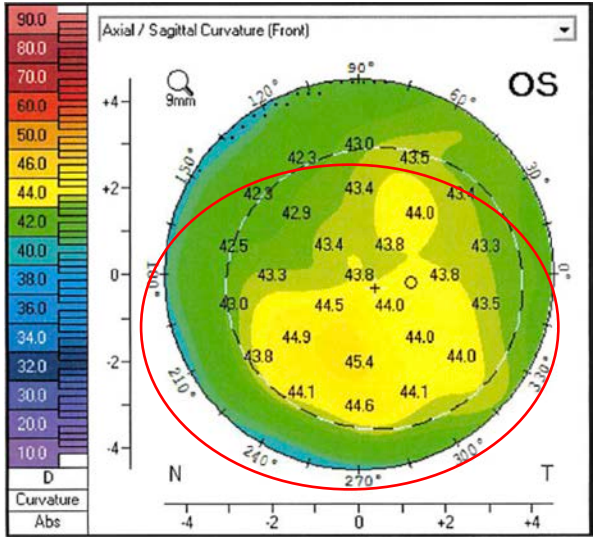
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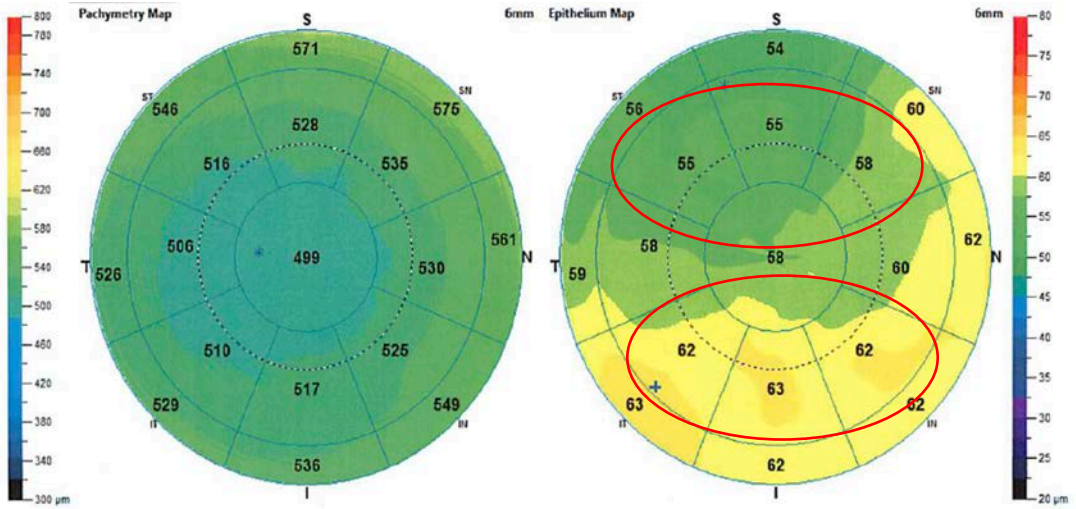
Pachymetry Map
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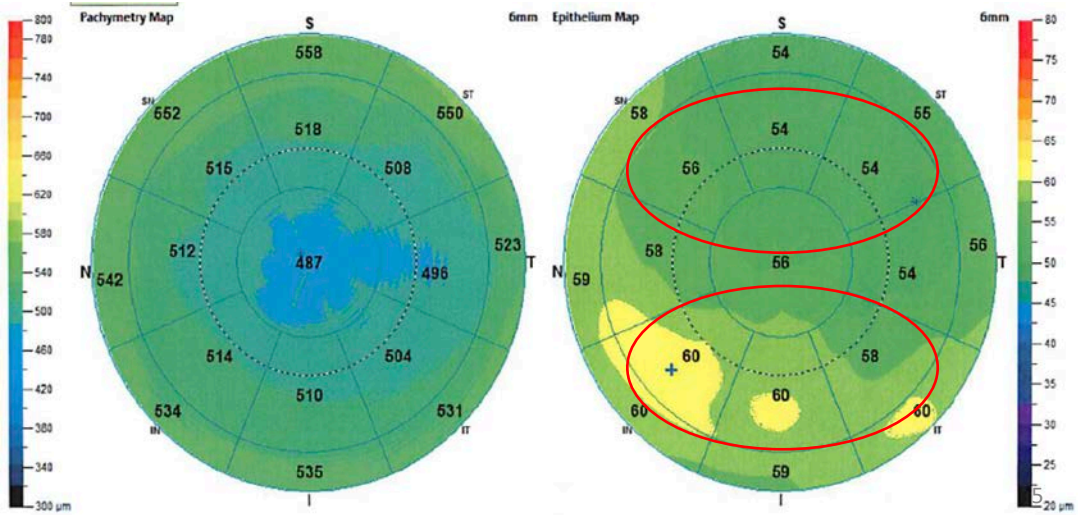
Pachymetry Map
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Epithelium Map
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Results

1. Inferior-superior axial power (3mm) asymmetry (mean ± SD):
   - Idiopathic corneal warpage: 1.16+/-0.32 D
   - normal eyes : -0.30+/-0.78 D [1]
2. Thinnest Pachymetry (mean ± SD):
   - 534 +/- 28 µm
3. Inferior-Superior Epithelial Thickness Asymmetry (mean ± SD):
   - idiopathic corneal warpage: 6.0 +/- 2.8 µm
   - normal eyes: 1.6 ± 1.8 µm [2]

[1]. Rabinowitz YS, (McDonnell PJ). *Refractive and Corneal Surgery*. 1989; 6:400.
[2]. Li Y, et al. (Huang D). *Ophthalmology*. 2012; 119:2425.

Conclusion

Idiopathic corneal warpage:

- New clinical entity
- Unclear etiology
- Topography and OCT are synergistic tools in differentiating warpage from ectasia, both of which could present with inferior steepening

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