

## INTRODUCTION

Keratoconus is a bilateral, often asymmetric corneal degeneration that results in progressive vision loss due to changes in corneal structure and transparency. Rigid gas permeable contact lenses are routinely used to provide adequate vision effectively reducing the irregularity of the refractive surface. In cases of severely thinned or scarred corneas or after failure of contact lens therapy, often the remaining viable treatment is penetrating keratoplasty. Full thickness corneal transplantation can improve clarity of vision and health of the globe, but should not be pursued hastily with modern lens designs that fit a large variety of corneal shapes compared with previous lens designs.

## HISTORY

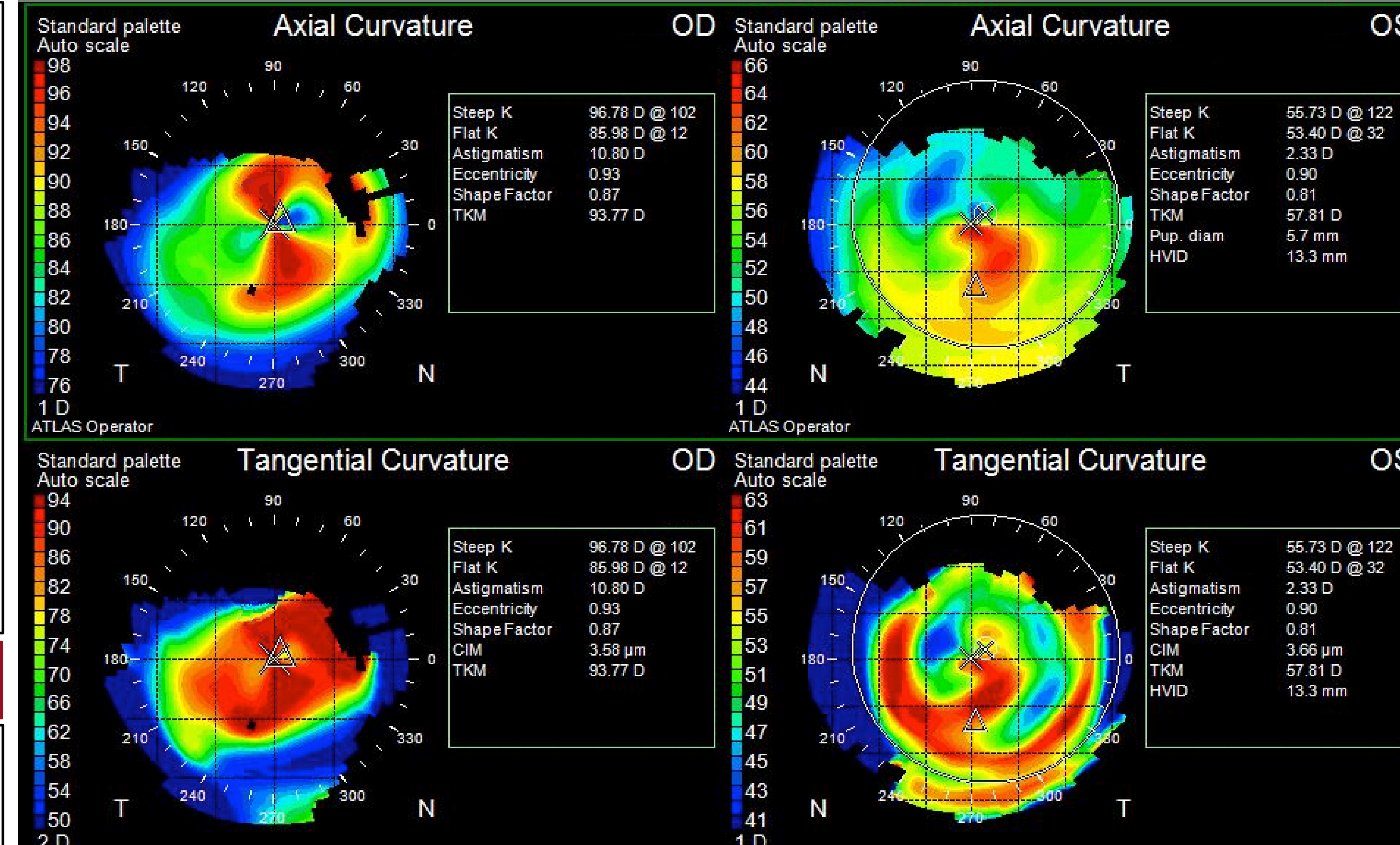
A 60 year old African American man was referred from his primary eye care provider to a corneal subspecialist to consider bilateral penetrating keratoplasty due to advanced keratoconus after failure of corneal gas permeable contact lenses.

## EXAMINATION

**Medical History:** Seasonal allergies, admits to eye rubbing  
**Ocular History:** Longstanding keratoconus, OAG suspect  
**Contact Lens History:** Has not tolerated lens OD in 15 years, poor success with spherical gas permeable contact lens OS  
**Social History:** Travels internationally as a full-time musician, can no longer read music with his contact lens OS

Findings	OD	OS
Best Corrected VA	20/400	20/80
Spectacle Rx	-15.00-3.75x143	-9.00-2.25x125
External Evaluation	Normal	Normal
Palpebral Aperture	15mm	15mm
Horizontal Visible Iris Diameter	13mm	13mm
Biomicroscopy Exam	Moderate apical scar with advanced ectasia, (+)striae, (+)Munson sign	Mild apical scar with ectasia, (+) striae (+)Munson sign
Keratometry (simK)	96.78 @ 102 85.98 @ 012	55.73 @ 122 53.40 @ 032

## TESTING



- Topographic testing of the right eye revealed extreme corneal steepening of the right eye with 10.00 diopters of astigmatism and the left eye demonstrated inferior steepening masked by corneal warpage from a poorly fitting spherical gas permeable contact lens.
- Pachymetry readings were 388 microns OD and 428 microns OS
- Macular OCT demonstrated normal foveal architecture OU

## RESULTS

Surgical consultation determined that the patient was a candidate for penetrating keratoplasty in the right eye followed by the left eye. However, after patient education and discussion with the surgeon, the patient was willing to consider scleral contact lenses to defer surgical intervention.

## FINAL CONTACT LENS PARAMETERS

OD	Alden Zenlens Prolate	5800 sag	6.60 mm BC		-8.50 sph
			Toric APS with Steep 3, Flat 3	17.0mm dia	20/50
OS	Alden Zenlens Prolate	4800 sag	7.10 mm BC		-5.50 sph
			Toric APS with Steep 3, Flat 3	16.0mm dia	20/30

Scleral contact lens fitting demonstrated adequate apical and limbal clearance and markedly improved visual acuity. The patient was pleased with the comfort and clarity of his new contact lenses, and was delighted to have delayed surgical intervention. The patient was able to regain drivers license privileges and returned to reading music.

## DISCUSSION AND CONCLUSION

Penetrating keratoplasty is a major surgery often reserved for advanced cases of corneal disease or trauma. It has been estimated that up to 20% of keratoconic patients require full thickness corneal transplant at some point in their lives after failure of optical correction by contact lens wear. As contact lens designs continue to improve in both aspheric corneal lenses and scleral lenses, PK may be avoided in some patients who return to successful lens wear.

In this case, the patient and the referring doctor had resigned his prognosis to poor without surgical intervention. Neither was aware of the potential for improvement with scleral contact lenses. Patient education and demonstration of improved visual acuity in office helped to provide confidence in the lens technology.

It may be effective to work closely with corneal subspecialists who are open to utilizing modern contact lens technology to avoid surgery. Some subspecialists and primary eye care providers may not be aware of the expanded parameters and customization that can be found to fit advanced cases of keratoconus. It is prudent to help educate patients and co-managing practitioners of these technologies to improve optical outcomes.

## REFERENCES

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