KERATOCONUS—A FAMILY DEMONSTRATING THE CONDITION AND A DISCUSSION OF THE TREATMENT

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Little emphasis has been placed on heredity as an aetiological factor in the occurrence of keratoconus. Salzmann, in 1907, suggested that it represented a primary anomaly of growth, and Collins and Magou, in 1925, suggested that it was due to 'failure in the normal toughening process'. It was not until 1958 that Franceschetti *et al.*[1] demonstrated that heredity might be an important factor.

Treatment

Refraction cannot materially overcome the complex hyperbolic curve of the cornea. Newcastle, in 1854, was the first to suggest that animal jelly, contained in glass capsules, should be placed in front of the eye.

It was not until 1918 that van Hippel suggested that contact lenses be used as a method of treatment, and at the present time these lenses are the method of choice in the treatment of keratoconus. Ridley[2] considered that, in addition to the improvement in vision, contact lenses might arrest the progress of the disease.

CASE REPORT

On 14 April 1961, M.E., aged 20 years, and his sister A.E., aged 19 years, both South African born Indians, presented themselves at the outpatient department of St. John Ophthalmic Hospital.

History

They both complained of impaired vision since early childhood.

Family History and Examination

The parents and siblings of these patients were examined and none of them showed signs of the condition. On careful questioning it was elicited that no one else in the family had any ocular complaints.

Examination

Both patients had bilateral keratoconus (Fig. 1A) and showed the following signs:

1. Thinning of the cornea at the apex.
2. An endothelial reflex in the central portion of the area at the apex of the cone, owing to increased concavity of the posterior surface of the cornea.
3. An increased visibility of the nerve fibres.
4. Vertical lines in the deeper layers of cornea — probably from stretching.
5. No rupture of Descemet's membrane.
6. Using a Placido's disc, the typical peculiar distortion of the rings was observed.

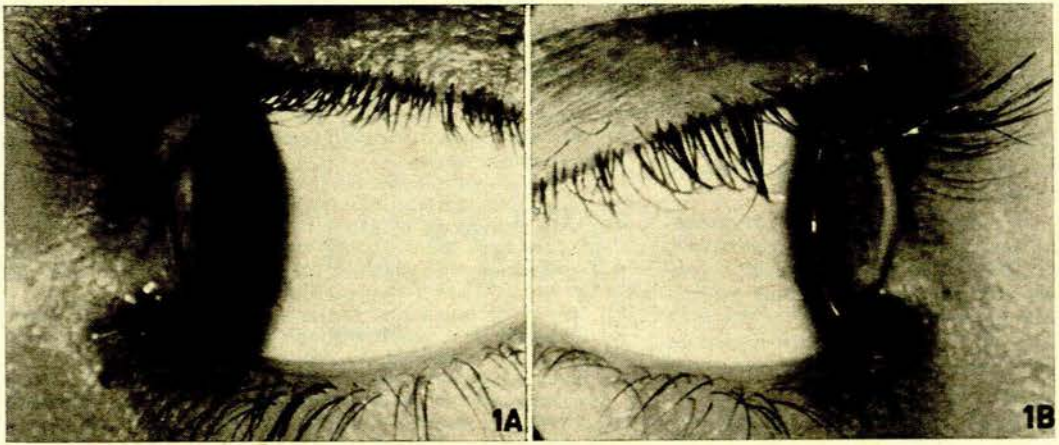

Fig. 1. A. Showing keratoconus in patient A.E. *B.* Showing contact lens in place in patient A.E.

Treatment

Contact lenses were fitted to both patients by Mr. E. Levey of the Contact Lens Centre in Johannesburg, with the co-operation of Mr. C. L. Field, the Technical Director of the Precision Contact Lens Laboratories.

These lenses, known as 'kerataco', were made by the Precision Contact Lens Laboratories in Johannesburg. The lenses are a development of an original idea of Dr. Voss of the Argentine, who suggested using a fairly steep, curved lens with 3 dimensions.

The lenses used in the 2 patients reported here have a base curve of 6·35 mm. They were made in ICI plastic known as 'shade 912 neutral'. The diameter of these particular lenses is 9·50 mm., although in many cases they have been made as small as 8·70 mm. The actual specification of the lenses (Fig. 1 B) are: base curve 6·35 mm., secondary curve 7·00 mm., third curve 7·50 mm., fourth curve 8·00 mm., fifth curve 8·50 mm., and the edge curve 12·55 mm. The thickness of the lenses at the centre is 0·12 mm.

The physical characteristics of the fit of these lenses, under fluoresceine with an ultraviolet lamp, show a minimal touch at the cone of the cornea, the lenses then following a fairly parabolic curve until the final edge curve rests on the cornea. A good flow of fluoresceine and tears was seen behind the lenses, and this gave even movement as the patient blinked, allowing oxygenation and general metabolism of the cornea to take place. The lenses were finally ventilated with a hole of a diameter of 1/64 of an inch, to increase the flow of tears and oxygen, etc., behind the lenses.

TABLE I. IMPROVEMENT IN VISUAL ACUITY

	Without contact lenses		*With contact lenses*	
	R. eye	*L. eye*	*R. eye*	*L. eye*
M.E. ..	6/36	Hand movements at 6 metres	6/9	6/9
A.E. ..	6/60	6/36	6/9	6/9

Both patients tolerated the lenses well. Table I shows the improvement in visual acuity resulting from the use of these contact lenses.

SUMMARY

1. A brother and sister, both with keratoconus, are described. The possible importance of heredity as a factor is discussed.

2. The patients were successfully treated with modified Voss lenses.

I wish to thank Dr. C. G. Booker, Superintendent of St. John Ophthalmic Hospital, for allowing me facilities to investigate this problem, and for his encouragement in connection with the writing of this article.

REFERENCES

1. Franceschetti, A., Lisch, K. and Klein, D. (1958): Zbl. prakt. Augenheilk., **133**, 15.
2. Ridley, J. (1956): Brit. J. Ophthal., **40**, 295.