Case notes

Keratoconus

Patient details

Initials: MI

Age: 21

Occupation: Engineering student

Drive: Yes

Digital device use: 9 hours VDU daily plus time spent using phone

Smoker status: Non-smoker

Hobbies: Running

Reason for visit: Bilateral blurred DVA and NVA for 1 year, RE > LE

General health: Asthma, allergies to eczema, hay fever, allergy to cat hair

Medication: Beclomethasone & salbutamol inhalers, clobetasone & hydrocortisone ointment, fexofenadine tablets

Ocular history: Nil

Family ocular history: Nil apart from spectacle wear

Examination

Slit lamp & undilated Volk Superfield

Right eye	Structure	Left eye
Eczematous lids	**Lids & lashes**	Eczematous lids
Grade 2 - 3 papillae	**Lid eversion**	Grade 2 - 3 papillae
Thinned centrally Vogt's striae	**Cornea**	Normal profile Vogt's striae
Grade 4	**van Herick**	Grade 4
Clear	**Lens**	Clear
C:D 0.20 Healthy NRR	**Disc**	C:D 0.20 Healthy NRR
Healthy	**Macula**	Healthy
No holes/ tears/detachment	**Periphery**	No holes/ tears/detachment

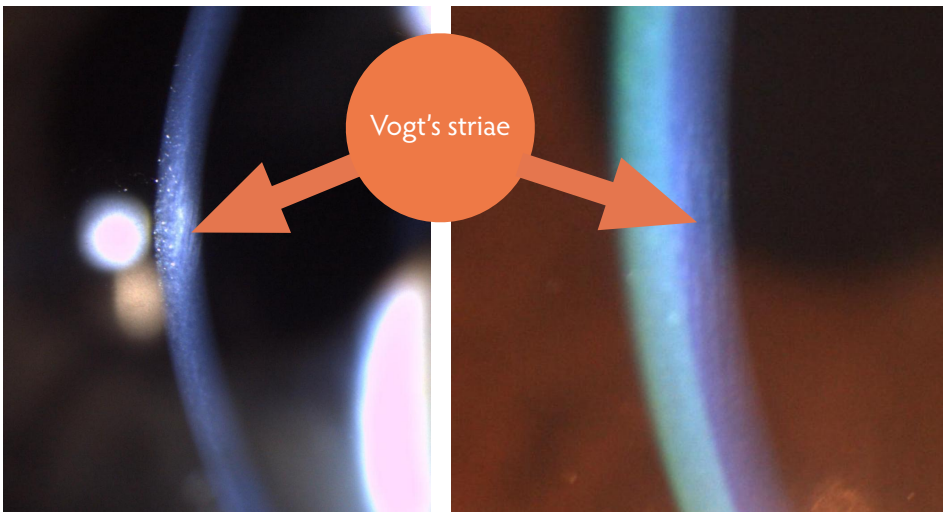
Refraction

-3.00/-4.75x112	-2.25/-3.25x75
6/12+, N6; PH 6/12	6/9+, N5; PH no ↑

Scissor retinoscopy reflex RE > LE

Subjective end-point difficult to establish RE & LE

Slit lamp: right eye



Vogt's striae

MI had Vogt's striae in both eyes. These fine vertically orientated grey lines are located in the posterior stroma and Descemet's membrane. The orientation of the striae can correlate with the steepest axis of the cornea, which is thought to be caused by mechanical stress on the collagen lamellae.

Discussion

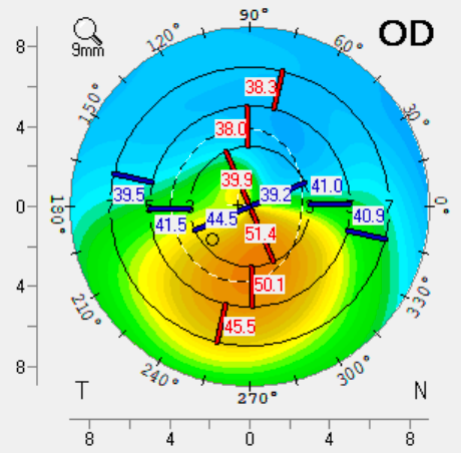
Risk factors for developing keratoconus are a family history of the condition, systemic disorders such as Down's syndrome, atopy (allergy eg hay fever, eczema, asthma), eye rubbing and ethnic heritage (individuals from Indian, Bangladeshi, and Pakistani backgrounds have a higher incidence of the condition).

MI has multiple risk factors: he is of Pakistani heritage, is an atope and admitted to eye rubbing as his eyes were often itchy, especially in summer when he suffers from hay fever.

Diagnosis

A referral was made to the hospital eye service where Pentacam assessment was performed. Bilateral keratoconus (right > left) was diagnosed.

Pentacam: right eye



Flatter curvature is shown in cool colours and steeper curvature in warm colours

Management

MI was listed for bilateral collagen cross linking. He was also prescribed preservative-free ketotifen eye drops twice a day to both eyes to manage his ocular allergy, together with preservative-free ocular lubrication 4 times per day, or more if required.

The patient was also referred to the hospital contact lens department for fitting of keratoconic contact lenses as he was not coping well with his reduced spectacle acuity.

He was advised to desist from eye rubbing.

A further referral was made to dermatology to optimise management of MI's eczema.

[1]NICE Guidance. https://www.nice.org.uk/guidance/ipg466

Collagen cross-linking

Collagen cross-linking (CXL)[1] aims to halt progression of keratoconus. The technique is thought to work by increasing the number of anchors that bond corneal collagen fibres together. In general, the procedure is performed on corneas that are thicker than 400µm.

During CXL, the cornea is bathed in riboflavin and exposed to UV radiation. Strict timings are required during the procedure.

In epithelium-off CXL, the procedure begins with debridement of the epithelium with a blunt spatula to allow penetration of riboflavin into the corneal stroma. There is a strong evidence-base for the efficacy of epithelium-off CXL. Post-operatively, patients experience significant pain for several days while the epithelium regenerates.

In epithelium-on CXL, the corneal epithelium is left intact (or may be partially disrupted) and longer exposure time to riboflavin is required. The evidence-base for this procedure is developing.

In general, CXL is not performed on corneas that have thinned 400µm or less, as riboflavin is toxic to the corneal endothelium. However, a modified technique using a riboflavin-soaked contact lens and/or reduced UV exposure time can be used for these cases.

Learning point

In years gone by, there was a prevailing concept that referral to an ophthalmologist was not necessarily required for patients who had early keratoconus. Subsequently, CXL has been shown to be safe and successful in stabilising the condition. Therefore, in order to ensure that the optimal treatment is offered to patients, a referral should be made for suspected cases.

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Mr Jeffrey Kwartz, Consultant Ophthalmologist, Bolton NHS Foundation Trust

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FODO
The Association for Eye Care Providers