

Case report: Toric scleral lens fitting in an advanced keratoconus patient with central corneal scar

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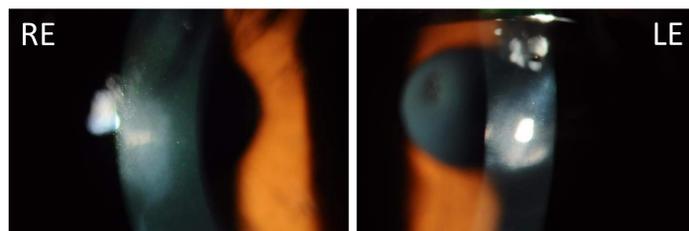
Purpose

To report a successful toric design scleral lens fitting of an advanced keratoconus patient

Case report

History

A 47-year-old Chinese male, LCM, presented to our clinic for eye examination and contact lens fitting. He was diagnosed with keratoconus in both eyes since 30 years ago. Corneal scarring were found in both eyes (see Fig. 1). He was prescribed with rigid gas permeable (RGP) lens in private optometrist. He was satisfied with his right lens. He left the left eye unaided since there was poor lens tolerance such as poor vision and discomfort.

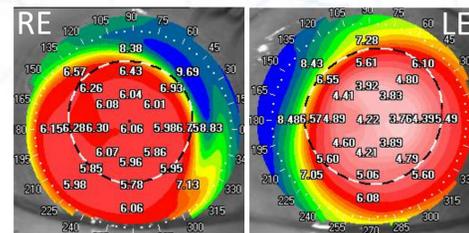


[Fig. 1] Corneal scarring of LCM

Assessment

Corneal topography showed moderate and severe keratoconus in RE and LE respectively (see Fig. 2). Anterior segment OCT also showed the steep corneal shape with central corneal scar.

Current RGP lens fitting was acceptable in RE (see Fig. 3). Contact lens fitting was arranged for the LE. After fitting the LE with scleral lens, patient requested to refit the RE with scleral lens for better comfort and vision.



[Fig. 2] Corneal topography of LCM



[Fig. 3] Habitual RE RGP fitting of LCM

Contact lens fitting

Since there were corneal scar in both eyes, scleral lenses (ICD 16.5) were fitted to vault over the steep cornea to provide stable vision and comfort. Central lens fitting were acceptable. However, significant vessel blanching were observed at superior and inferior scleral regions in both eyes (see Fig. 4). To reduce the vessel blanching and match with the asymmetric scleral profile, toric design scleral lenses (ICD 16.5 toric) were fitted. After the lens modification, optimal central vaulting were achieved and minimal vessel blanching were found in both eyes (see Fig. 5).



[Fig. 4] Inferior vessel blanching with spherical design scleral lens

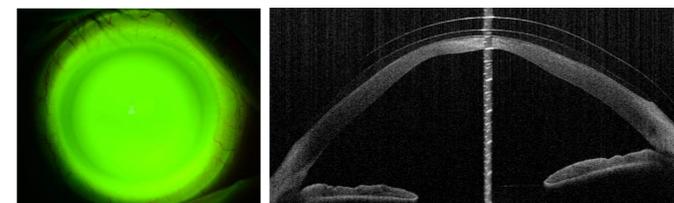
[Fig. 5] Improved inferior vessel blanching with toric design scleral lens

As the cornea was very steep in LE, there was still excessive mid- peripheral clearance despite modification on peripheral corneal clearance zone (PCCZ) and limbal clearance zone (LCZ). The excessive tear film created tear debris resulting in hazy vision (see Fig. 6). The patient was suggested to replace the filling saline at regular time intervals to maintain clear vision.

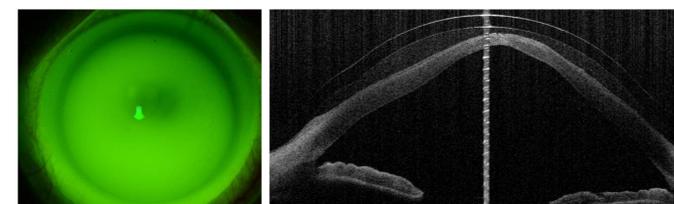


[Fig. 6] Tear debris trapped in left lens

In subsequent aftercares, lens fitting (see Fig. 7A and 7B) and ocular health were both acceptable and patient was satisfied with the lens performance in both eyes.



[Fig. 7A] Final lens fitting for RE
ICD 16.5 Toric / Sag 4400 / LCZ Steep +5/ LCZ Flat +3/ PCCZ -3/
SLZ Standard/ -3.50DS/ HDS100/ Diameter 16.5/ BCVA 6/9.5-



[Fig. 7B] Final lens fitting for LE
ICD 16.5 Toric / Sag 4800 / LCZ Steep +10/ LCZ Flat +3/ PCCZ -7/
SLZ Standard/ -6.00DS/ HDS100/ Diameter 16.5/ BCVA 6/15+

Discussion

Corneal RGP is used as the initial visual correction for keratoconus patients. However, as the corneal profile steepen due to corneal scarring or disease progression, it may no longer be able to achieve acceptable fitting and vision. Therefore, larger diameter scleral lenses, which vault over the cornea and land on sclera, could be used to enhance the lens stability, comfort and vision.

Since the sclera is usually asymmetric, standard scleral lens design could cause vessel blanching at the steep scleral meridian. Toric designed lens, which provide increased sagittal depth at one meridian, can help to obtain a better alignment and reduce excessive indentation on the sclera.

Practitioners may consider to switch from small diameter lens to large diameter lens according to habitual lens performance and disease progression. Toric design could be applied when there is significant vessel blanching at particular regions or the sclera is found highly asymmetric with scleral topography mapping tools.

References

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