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Cross-linking may be option for Terrien marginal degeneration

The treatment reversed the process of corneal thinning in one patient, with positive vision results and stable outcomes at 5 years.

Corneal cross-linking might represent a new option for Terrien marginal degeneration, a disease for which no treatment has yet been found.

"We only treated two eyes, but it was the first time a Terrien could be stopped and partially reversed," **Farhad Hafezi, MD, PhD,** OSN Europe Edition Board Member, said in a telephone interview with Ocular Surgery News.

Farhad Hafezi

Terrien marginal degeneration is a bilateral, irreversible disease characterized by progressive thinning of the peripheral corneal stroma that starts superiorly and spreads circumferentially. It is painless but slowly leads to perforation.

"It is a nightmare for us because nothing can be done but wait until the cornea is perforated and then patch it with scleral or corneal tissue. Keratoplasty techniques are rarely successful because you have to place the graft eccentrically, and visual results are extremely poor," Hafezi said.

Corneal homeostasis, he explained, is a delicate balance of collagen synthesis and catalysis, mediated by keratocytes and digestive enzymes. In Terrien marginal degeneration, the balance is lost in favor of catalysis processes, leading to a progressive thinning of the stromal tissue.

"The rationale why Theo Seiler and I used cross-linking in this patient is that it might lead to increased resistance of the corneal stroma to enzymatic digestion," Hafezi said.

Improvement and stability at 5 years

One patient, a 47-year-old man diagnosed with Terrien marginal degeneration 1 year earlier, was treated with cross-linking in the left eye in 2008 and in the right eye in 2011. The Dresden protocol was followed, with the variant of decentering the irradiation toward the periphery of the cornea.

"A progressive improvement of the keratometric readings after CXL was observed in both eyes. The thinnest corneal point increased from 414 µm to 450 µm in the left eye and from 380 µm to 424 µm in the right eye. The patient progressively regained vision, improving in the left eye from BCVA 20/63 at baseline to 20/50 at 1 year and 20/32 at 3 and 5 years. The right eye improved from 20/63 to 20/50 at 2 years," Hafezi said.

The patient was able to wear semi-rigid gas permeable contact lenses again 1 year after cross-linking.

"With a follow-up of 5 years, in which improvement and then stability have been achieved, we can reasonably be optimistic," Hafezi said. "We may speculate that CXL not only halted but also reversed the process of corneal thinning induced by the disease. The stiffened and reinforced collagen fibers became resistant to enzymatic digestion and new collagen could be produced."

Further data are needed to validate the efficacy and safety of the cross-linking procedure in Terrien marginal degeneration, but this experience looks promising.

"CXL might become a treatment option and may even be used prophylactically as soon as the diagnosis of [Terrien marginal degeneration] is confirmed," Hafezi said. – *by Michela Cimberle* OSN

Reference:
Hafezi F, et al. *J Refract Surg*. 2014;doi:10.3928/1081597X-20140527-02.

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Disclosure: Hafezi has no relevant financial disclosures.