

# Laser technique *for keratoconus*

Femtolasar circular keratotomy shows promise for early-stage keratoconus.  
*Dermot McGrath reports*

**F**emtosecond-laser induced circular keratotomy (FSCKT) seems to be safe and effective in halting the progression of early-stage keratoconus and may provide a viable alternative to corneal collagen cross-linking (CXL) in patients contraindicated for that procedure, according to a study presented at the 37th Congress of the ESCRS in Paris.

"Our three-year results indicate that FSCKT is effective in stopping the progression of keratoconus of stage I and II in nine of 10 eyes. The mean visual acuity, corneal thickness and keratometric values all remained stable over the follow-up period," said Detlev Breyer MD, owner and leading anterior segment surgeon, Breyer-Kaymak-Klabe Augenchirurgie, Düsseldorf, Germany.

Dr Breyer's retrospective study included 10 eyes treated with FSCKT, 114 eyes with CXL and 85 eyes with iontophoresis-assisted corneal crosslinking (ICXL). The analysis of results included follow-up of up to five years for FSCKT and CXL and one year for ICXL.

The surgical technique for FSCKT is essentially a refinement of circular keratotomy, with the penetrating dissection made with a proprietary femtosecond laser (Femto LDV Z6, Ziemer) instead of a trephine knife.

"The idea is to use the laser to create an intrastromal cut but without perforating either Bowman's layer or Descemet's membrane in order to create a circular scar that stabilises the corneal surface. The desired effect is an intrastromal scar, which acts like a stabilising ring. The advantages of this approach are that it is sutureless and faster than manual keratotomy, with minimal risk of infection and greater comfort for the patient," he said.



Detlev Breyer MD

The study also sought to assess the outcomes of iontophoresis-assisted corneal cross-linking, an epithelium-on approach that increases the absorption of riboflavin into the corneal stroma with a non-invasive delivery system via a small electric current.

"The main advantage of this approach is that the epithelium remains intact, the patients don't experience pain and there is no risk of infection. So, if it would work it would be a clear improvement on conventional CXL," said Dr Breyer.

In terms of results, one eye initially treated with FSCKT displayed progressing keratoconus and was retreated with CXL. In the CXL-group, the outcomes remained stable or improved, whereas the



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first results for ICXL turned out to be less effective at halting the progression.

"Therefore, we regard it as a proper alternative to CXL only for early stages of keratoconus. For FSCKT the results are promising but we need outcomes in more eyes with a longer follow-up to determine the safety and efficacy of the procedure and the longevity of keratoconus stabilisation," he concluded.

Detlev Breyer:  
[d.breyer@augenchirurgie.clinic](mailto:d.breyer@augenchirurgie.clinic)



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