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## Miguel Rechichi

Magna Graecia University, Italy

### New perspectives in non-invasive keratoconus treatment: Improve vision through cornea reshaping

**Purpose:** To compare functional results in two cohorts of patients undergoing epithelium-off pulsed (pl-ACXL) and continuous light accelerated corneal collagen crosslinking (cl-ACXL) with dextran-free riboflavin solution and high-fluence ultraviolet A irradiation.

**Design:** It is a prospective, comparative, and interventional clinical study.

**Methods:** 20 patients affected by progressive keratoconus were enrolled in the study. 10 eyes of 10 patients underwent epithelium-off pl-ACXL by the KXL UV-A source (Avedro Inc., Waltham, MS, USA) with 8 minutes (1 sec. on/1 sec. off) of UV-A exposure at 30 mW/cm and energy dose of 7.2 J/cm; 10 eyes of 10 patients underwent an epithelium-off cl-ACXL at 30 mW/cm for 4 minutes. Riboflavin 0.1% dextran-free solution was used for a 10-minutes corneal soaking. Patients underwent clinical examination of uncorrected distance visual acuity and corrected distance visual acuity (UDVA and CDVA), corneal topography and aberrometry (CSO EyeTop, Florence, Italy), corneal OCT optical pachymetry (Cirrus OCT, Zeiss Meditec, Jena, Germany), endothelial cells count (I-Conan Non Co Robot), and *in vivo* scanning laser confocal microscopy (Heidelberg, Germany) at 1, 3, 6 and 12 months of follow-up.

**Results:** Functional results one year after cl-ACXL and pl-ACXL demonstrated keratoconus stability in both groups. Functional outcomes were found to be better in epithelium-off pulsed light accelerated treatment together with showing a deeper stromal penetration. No endothelial damage was recorded during the follow-up in both groups.

**Conclusions:** The study confirmed that oxygen represents the main driver of collagen crosslinking reaction. Pulsed light treatment optimized intraoperative oxygen availability improving postoperative functional outcomes compared with continuous light treatment.

### Biography

Miguel Rechichi has completed his training in ophthalmology and his PhD from Magna Graecia University and Diploma of Specialist Superior in Ophthalmology from University of Lugano (Switzerland). He's actually a researcher for Magna Graecia University and founder of corneal and refractive Surgery service of Eye Center Clinic in Catanzaro, Italy. He is a pioneer of cross-linking clinical application and actually is involved in developing new accelerated cxi protocols and topography guided crosslinking for which he's invited as opinion leader to several meetings. He has published several papers in reputed journals and has been serving as an Editorial Board Member of repute.

[miguel.rechichi@libero.it](mailto:miguel.rechichi@libero.it)