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Progress of the 28-year laser vision technology

This presentation consists of the historical review of ophthalmic laser technologies (1987 to 2016) and the recent developments of corneal cross-linking (CXL). The first human trial of PRK conducted in 1987 was based upon the IBM patent (UV laser for organic tissue ablation) and obtained the FDA clearance in 1995 (and LASIK in 2002). The flying-spot scanning technology for customized corneal reshaping was first proposed by Dr. J.T. Lin in 1992 (US patent). During 1995-1999, various laser systems/procedures were developed including: LTK (using Ho:YAG), DTK (using diode laser), RF and CK for hyperopia corrections; solid state lasers YAG-213 nm (for PRK), Mini-Excimer for PRK etc. Technologies developed in the 2000s include: eye-tracking device, micro-keratome, Elevation map, topography-guided LASIK, wave-front for customized LASIK; presbyopia treatment using accommodative IOL, SEB (Schachar) and laser scleral-ablation (Lin); and femto-second lasers (for cornea flap, cataract and stroma lens cut). In the recent years, UV-light riboflavin-activated corneal cross-linking (CXL) has been explored for various combined procedures including CXL-femto-laser, CXL-IOL, CXL-corneal-ring, CXL-sclera, and CXL-pediatric-myopes. The technical and clinical issues for CXL will be presented including: the optimal dose for new protocols, and riboflavin diffusion methods such as epi-off, epi-on, direct introduction of riboflavin into the stroma (pocket technique, ring technique, needle technique), and enrichment of riboflavin in the stroma by iontophoresis. Optimal CXL based on a dynamic theory will be presented for the first time.

Biography

J T Lin completed PhD in 1981 from University of Rochester. He served as a Visiting Professor at National Chao-Tung University and Associate Professor at the University of Central Florida, Founder & CEO of Nasdaq-listed companies. He is the Chairman and CEO of New Vision Inc. and a Visiting Professor at HE Medical University (China). He holds over 40 patents and is the inventor (US patents, 1992, 2000) of LASIK procedure using flying-spot scanning method and the solid-state UV laser. He has published over 55 book chapters and 70 SCI journal papers. He is WHO's WHO in Leading American Executives, Model of overseas Chinese Young Entrepreneur and Fellow of American Society of Laser Surgery & Medicine.

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