The Athens Protocol (Topography-guided PRK and CXL) vs. ICRS

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The Athens Protocol: Same day combined topography-guided partial PRK (TG-PRK) and corneal collagen crosslinking (CXL) is safe and effective for improving visual function in eyes with keratoconus (KC)[1-3] and ectasia after LASIK[4] and preventing further disease progression, said A John Kanellopoulos MD.

The PRK procedure is performed to improve BSCVA and the biomechanical behavior of the ecstatic cornea, by normalising the corneal surface and is done using the topography-guided platform of Allegretto excimer laser (Alcon Laboratories) with guidance from topographic imaging (Placido disc topography and/or Pentacam tomography). The ablation is designed to flatten some of the cone apex but also treats an arcuate (hyperopic-like) broader area away from the cone (usually in the superonasal periphery) that produces some elevation adjacent to the cone. The treatment plan can be visualised in Figure 1 below.

The procedure is performed using a 5.5mm optical zone and aims to treat up to 70 per cent of cylinder and 70 per cent of sphere with removal of no more than 50 microns of stroma. Mitomycin 0.02 per cent is applied for 20 seconds intraoperatively.

Pre- and post-treatment topographies of the Athens Protocol applied for ectasia are seen in Figure 2 above.

"We are frugal with the amount of tissue removed because these eyes have thin corneas. Considering the average thickness is about 450 microns, we have set 50 microns as an arbitrary ablation limit to comply with the 400 micron minimum thickness criteria for CXL," said Dr Kanellopoulos.

"Treating an area away from the cone and using a small optical zone help to minimise tissue removal, although the small optical zone can result in night vision symptoms."

Patients may experience significant pain after the procedure and are treated with antibiotic and cortisone drops, and a bandage contact lens. In a series of about 1,200 cases, there have been just a few eyes that developed significant scarring, delayed epithelial healing was encountered in some cases and treated with lubrication and homologous serum.

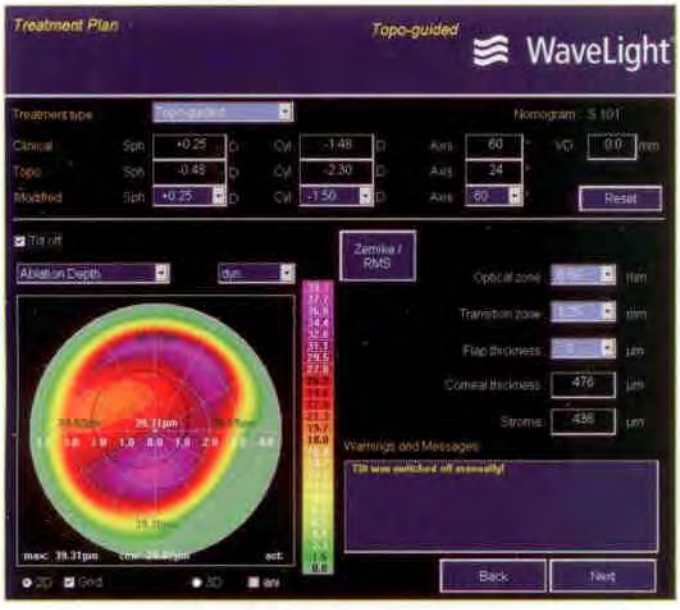

Figure 1

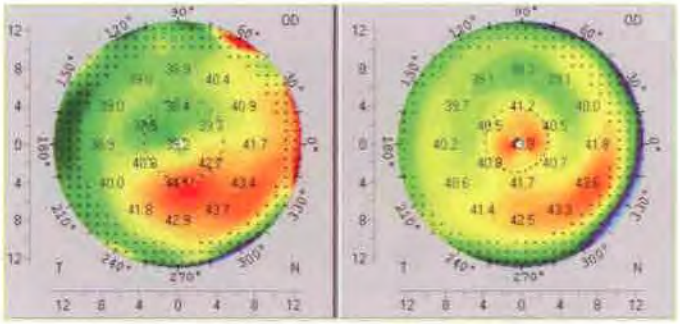

Figure 2

Dr Kanellopoulos noted he implanted intracorneal ring segments (ICRS; Intacs, Addition Technology) for visual rehabilitation in eyes with KC for several years. Using a nomogram that was a modification of the technique described by Joseph Colin MD, the results were favourable in terms of topographic, refractive, and visual acuity improvements. However, complications were common, including intrastromal deposits, ICRS extrusion, and infections.[5]

"I believe continued corneal thinning may account for some of the problems, and while most patients did not want to undergo explantation because they enjoyed great visual rehabilitation, they were treated successfully by ICRS removal followed by the Athens Protocol (CXL and TG-PRK)," said Dr Kanellopoulos.

He mentioned that results from early experience using an infrared continuous wave laser (Seros Medical) to shrink the anterior stroma followed by epithelium-on CXL are also encouraging. The novel, minimally invasive laser, which appears to have no effect on the epithelium, may be used to flatten the cone without any tissue removal. In an initial case, a 6 D flattening effect was achieved with no regression during follow-up to eight months, Dr Kanellopoulos reported.

References:

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