

# Modified INTACS in keratoconus

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# Introduction

- The use of INTACS in the surgical management of keratoconus has been reported earlier by several investigators including Colin et al and Boxer Wachler et al.
- In this study we evaluated the safety and efficacy of a modified technique for implantation of INTACS in keratoconus

# Methods

- 20 eyes of 15 patients, underwent modified intracorneal ring segment implantation for visual rehabilitation
- We evaluated pre- and post-operative
- Visual acuity, refractive error, keratometry, centration of optical pachymetry (orbiscan), corneal topography, endothelial cell count and contrast sensitivity. Mean follow-up was 2-9 months (5)

# Technique Protocol:

- Horizontal asymmetric segments implanted through temporal incision 70-75% depth and thinner segment on top
- Center of rings de-centered up to 1mm from the pupillary center towards center of cone.
- All procedures under topical 2%xylocaine gel

# Example of segment orientation



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# Technique Protocol

## Ring segment size:

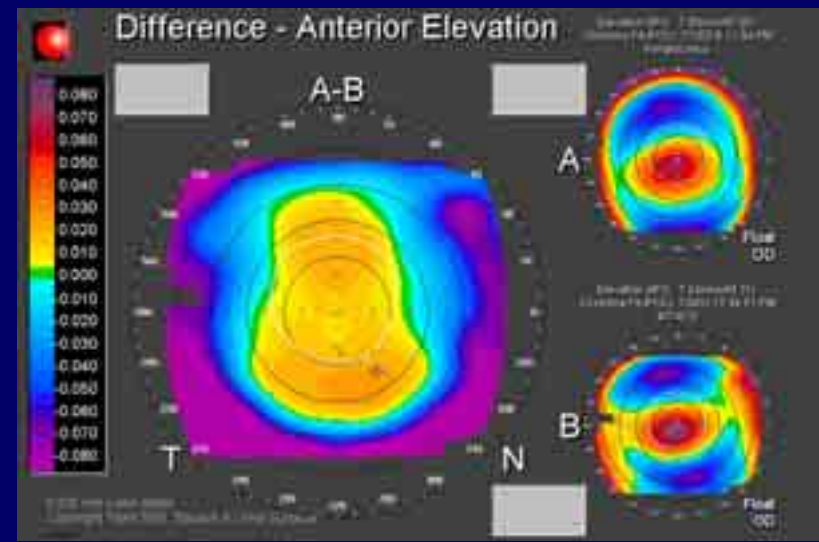
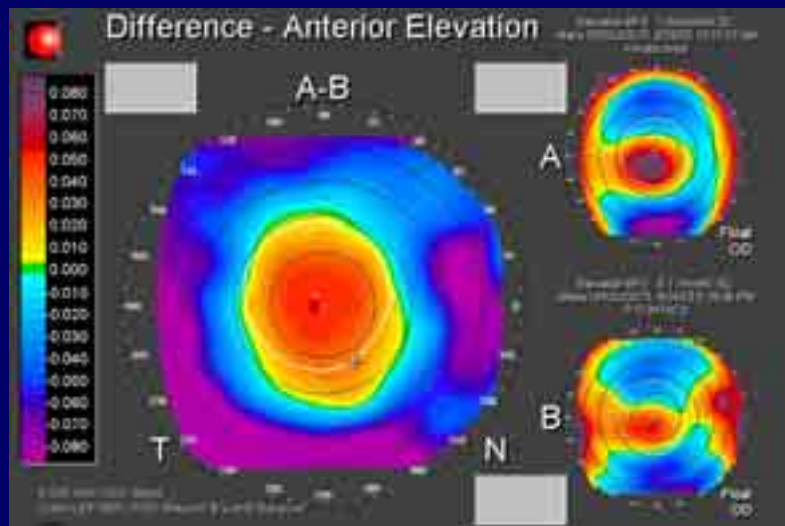
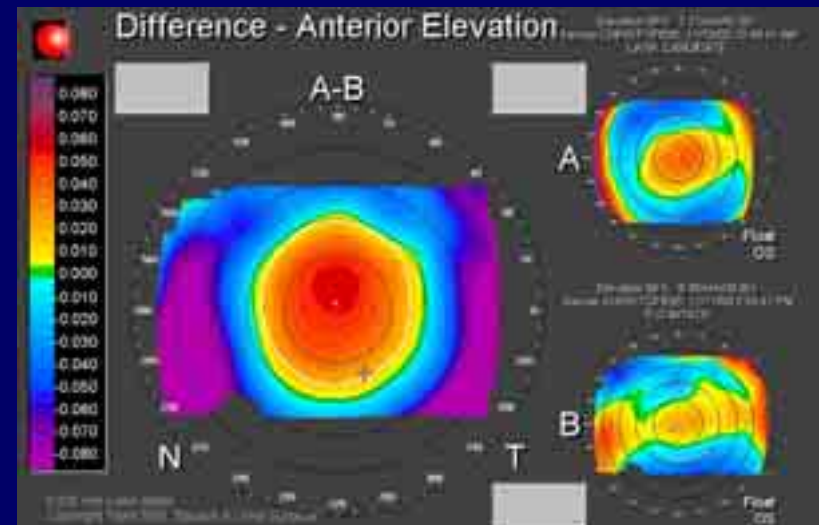
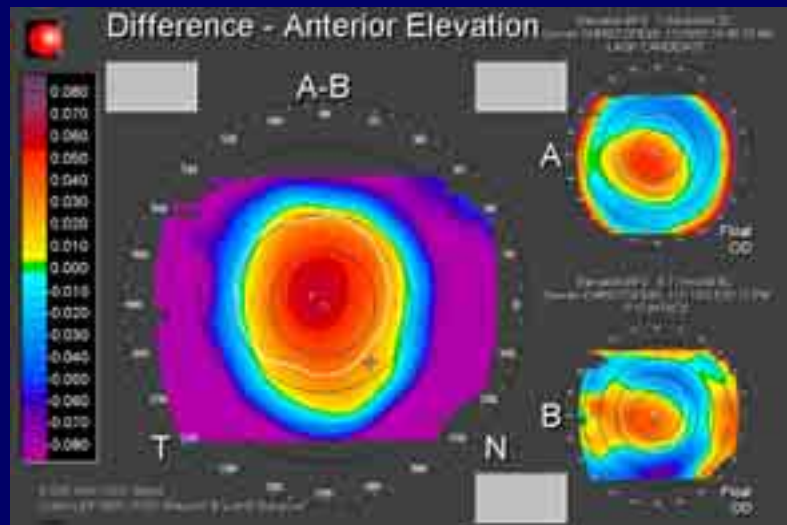
- Selection was based on spherical equivalent:
- $<-2D$  0.25 and 0.35
- $-2D$  to  $-4D$ : 0.25 and 0.40
- $-3D$  to  $-5D$ : 0.25 and 0.45
- $-5D$  to  $-6D$  0.35 and 0.45
- $>-6D$  0.40 and 0.45

## Results in mean values:

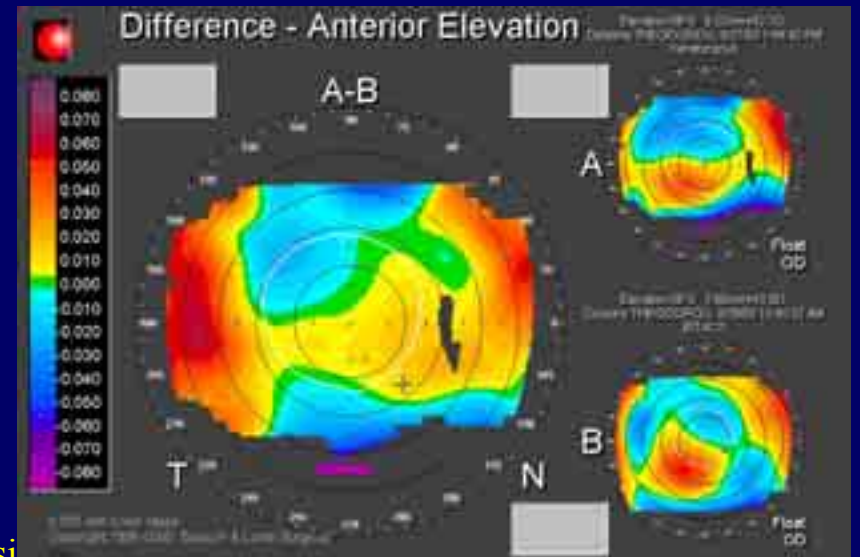
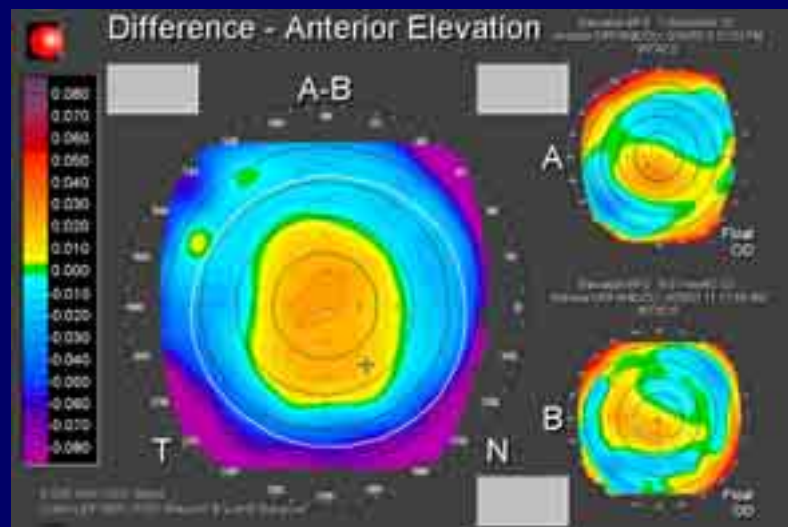
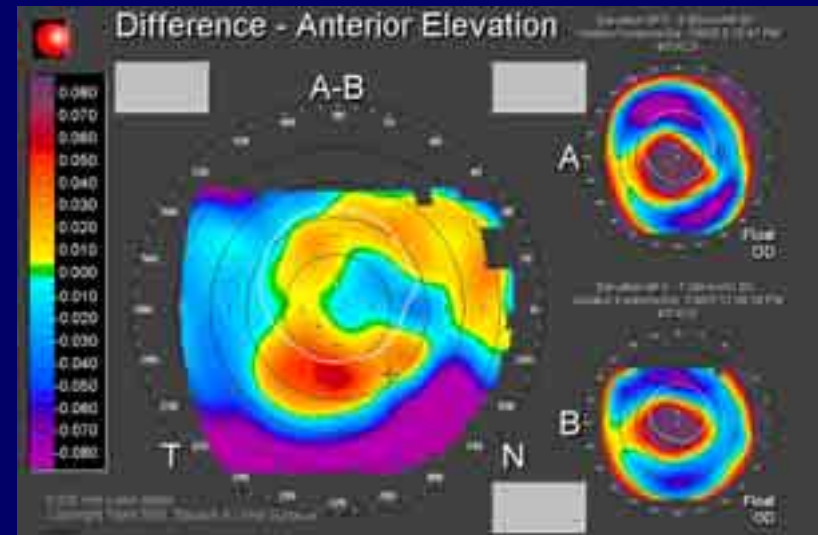
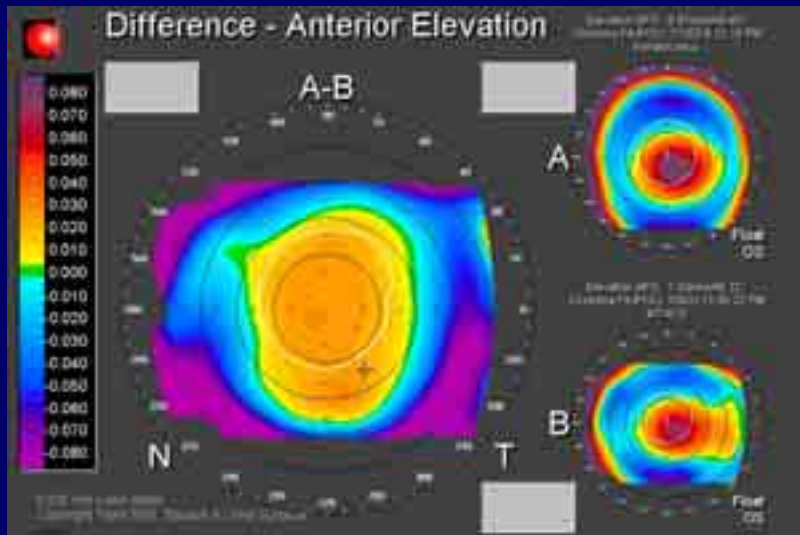
- UCVA improved from 20/400 to 20/70
- BSCVA improved from 20/50 to 20/25,
- RE improved from average sphere of  $-4.00\text{D}$  ( $-1.00$  to  $-7.50$ ) to  $-2.25\text{D}$  ( $+1.00$  to  $-2.50$ ) and average cylinder of  $-4.50\text{D}$  to  $-1.75\text{D}$ ,
- Keratometry improved from mean  $49\text{D}$  to  $46\text{D}$ , the centration of the thinnest cornea improved from  $2.5\text{mm}$  to  $1.2\text{mm}$ ,
- ECC improved from 2850 to 2950.



# Change in anterior topo elevation 1



# Change in anterior topo elevation 2



# Results-Intra-operative comps

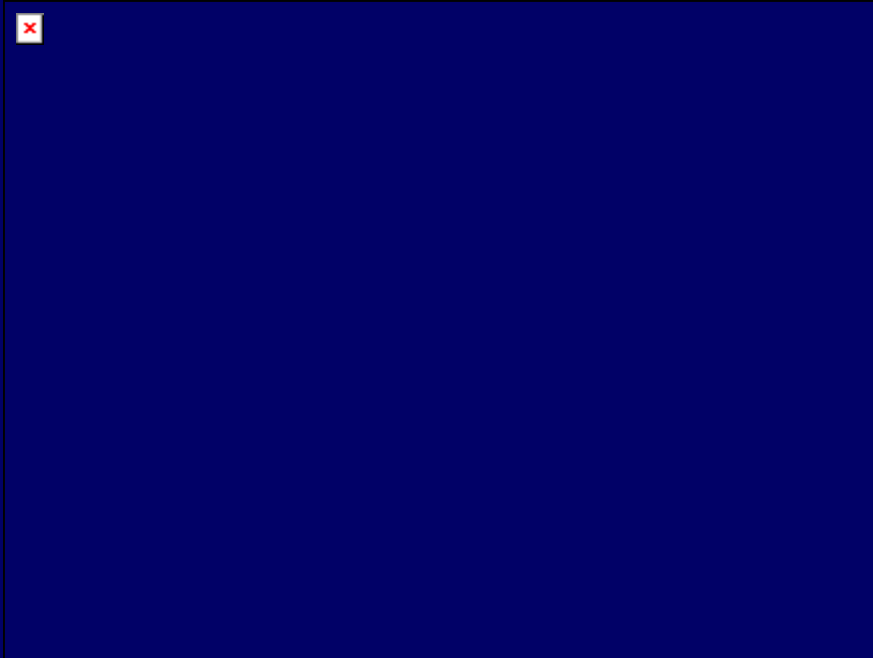
- One intra-op micro-perforation during the radial incision-the case was completed with a nasal radial incision
- One chamber perforation during the spacer advancement in a superior channel. This was repeated in 1 month successfully.
- One inadvertent radial incision extended to the limbus due to pt movement-uneventful procedure otherwise

# Results-complications

Seven cases had repeated extrusion resulted in removal

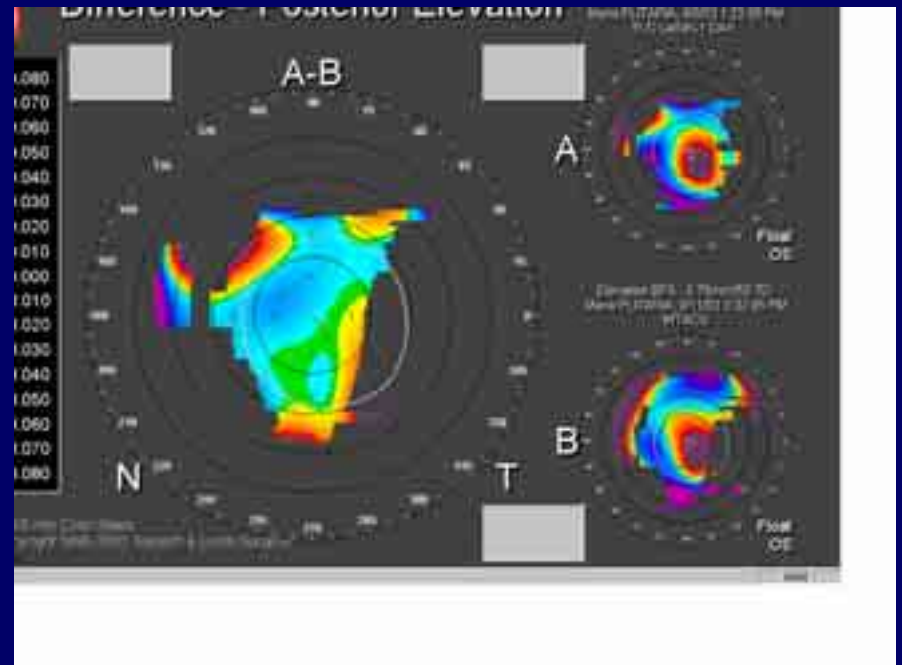
- 2 cases were removed due to patient discomfort
- 1 case developed sterile infiltrate-rings removed

# Attempts to secure extruding segments with 10-0 nylon sutures



# Results

- One case of incision extension to limbus

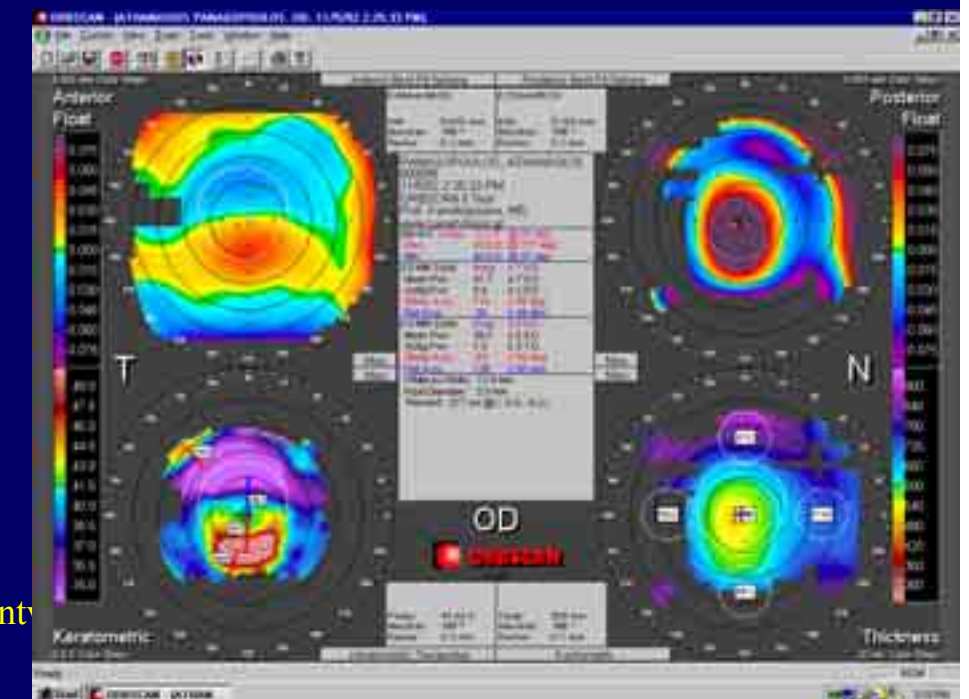
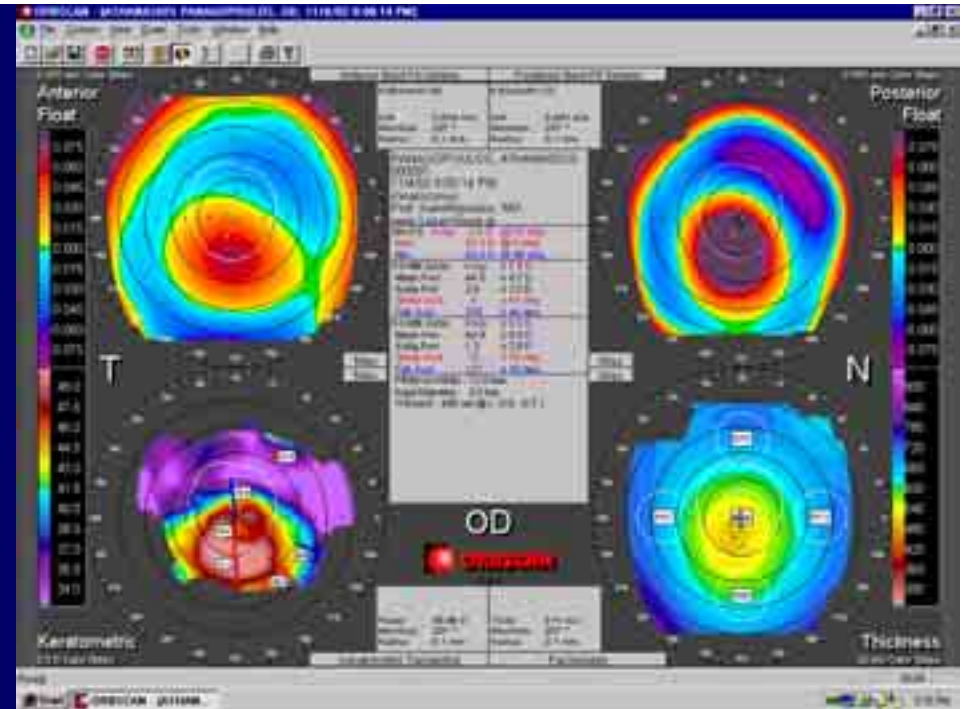


## Results:

- There was significant contrast sensitivity improvement.
- Post-op autorefraction, topographic astigmatic values, and wavefront refraction greatly different from manifest refraction



Orbscan topographic measurements revealed a cone flattening effect as well as a apparent cone deviation towards the central cornea





# Conclusions:

- This procedure appears a safe and very effective alternative in the visual rehabilitation of moderate to severe keratoconus.
- All patients had BCVA and UCVA gain though not all UCVA < 20/40
- The results are superior to PK in eventual UCVA

# Conclusions

- Topography and pachymetry clearly demonstrates cone shift to a more central location
- As a result there is improvement in astigmatism and myopia
- ? Effective post-LASIK

Thank You

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