

secoir

Alicante 2014

Ferrara corneal ring segments implantation for paracentral keratoconus with coincident topographic and coma axis

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Keratoconus

ICRS

- Tratamiento refractivo + terapeutico
- Basado en el fenótipo del cono
- Classificar queratocono
- Atitud “refractiva” ante la enfermedad
- Asociación otros procedimientos

Keratoconus

ICRS

ZO de 5 mm

Secção de triângulo isósceles

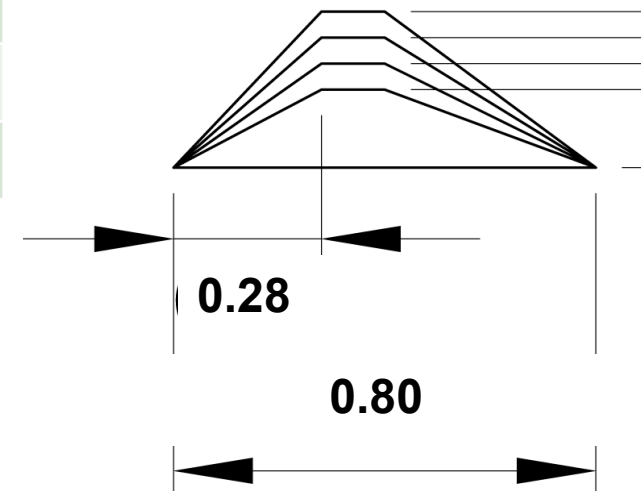
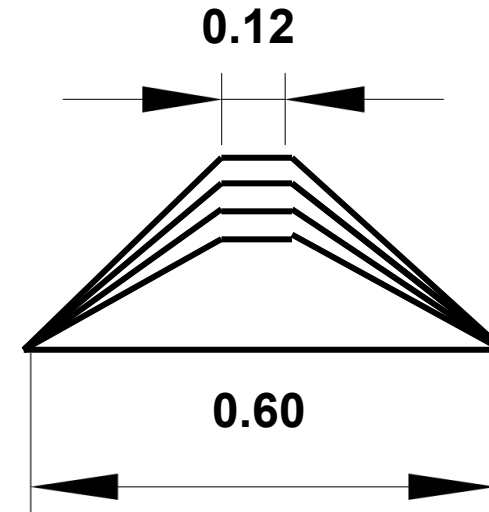
Base de 600 micras

| Zona Optica | Arco | Altura |
|-------------|-------------|--------|
| 5,00 mm | 60/70/80/90 | 150 |
| 6,00 mm | 100/110/120 | 200 |
| | 130/140/150 | 250 |
| | 160/170/180 | 300 |
| | 190/200/210 | |

ZO de 6 mm

Secção de triângulo escaleno

Base de 800 micras



Keratoconus

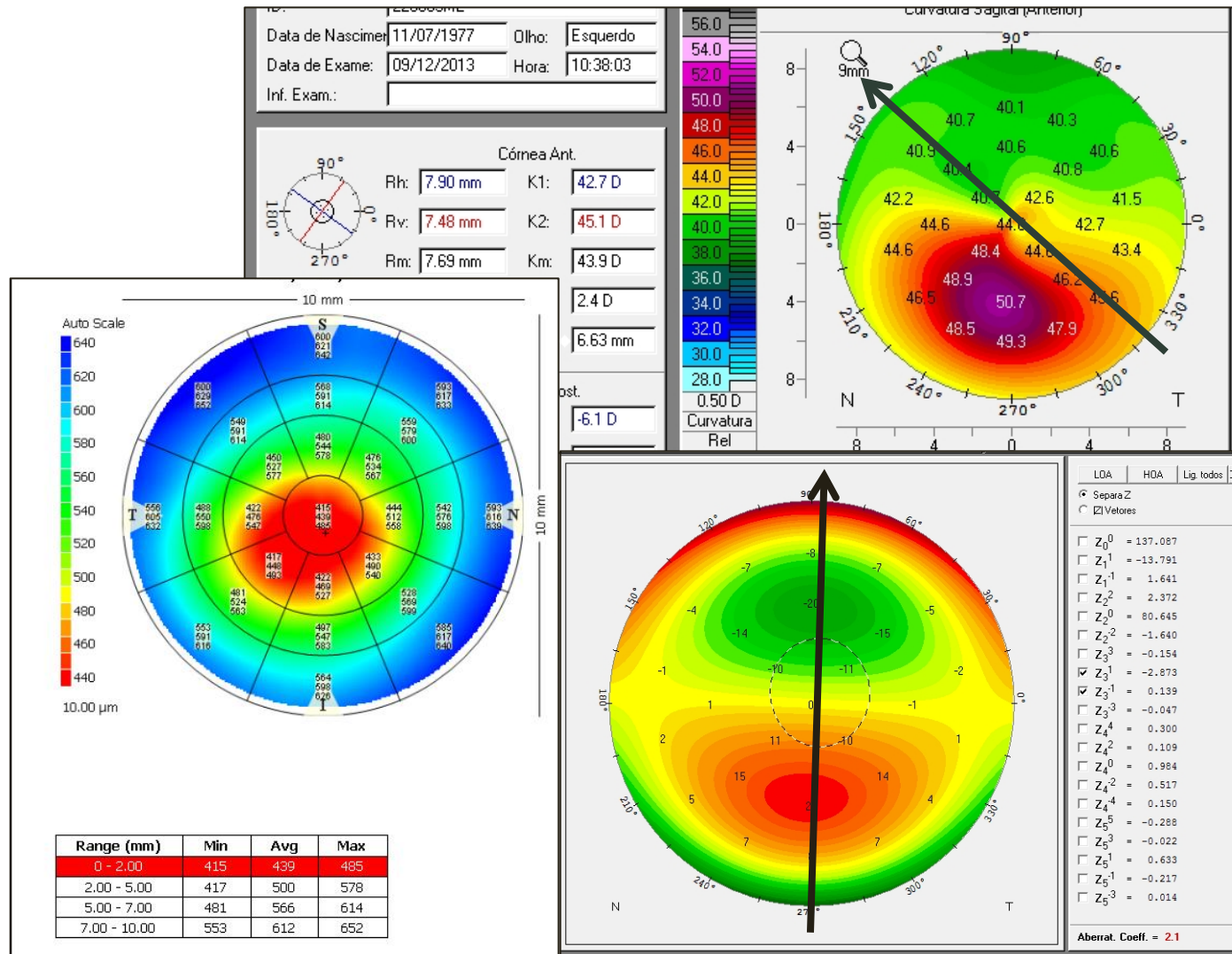
Fenotipo

| Paquimetria | Astigmatismo | Topo / Coma | Asfericidad (Q) |
|------------------------|--------------|-------------|-----------------|
| Central < 0,7 mm | Directo | < 30° | < -0,25 |
| Paracentral 0.7-2.1 mm | Inverso | 30-75° | -0,25 / -1,25 |
| Pericentral > 2.1 mm | Obliquo | > 75° | > -1,25 |

Nomograma Dr. José Alfonso IOFV

Keratoconus

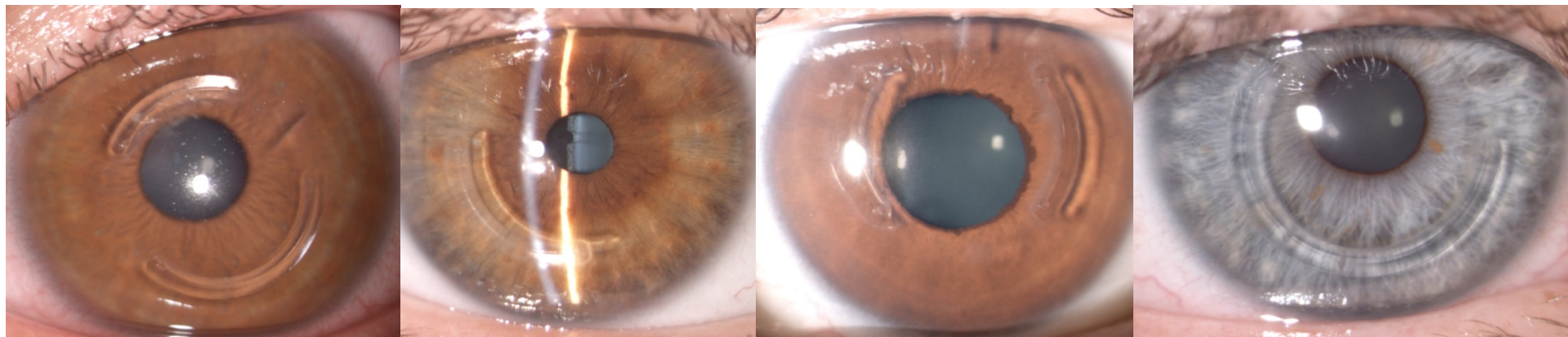
Fenotipo



Keratoconus

Fenotipo

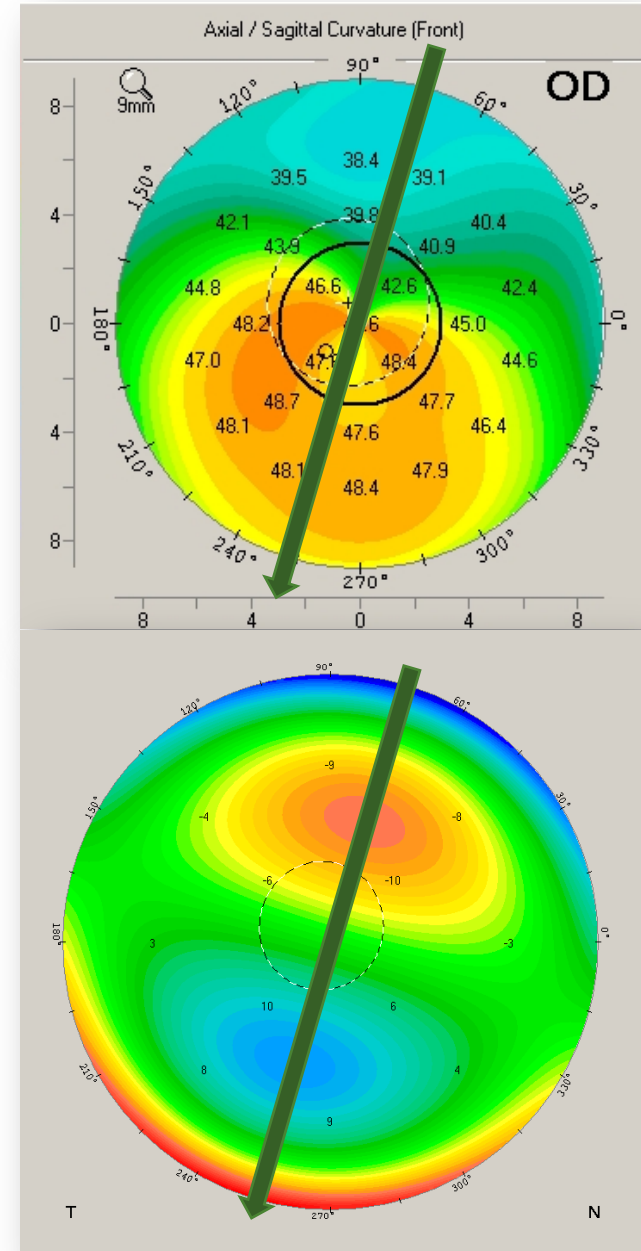
| Croissant | Duck | Snowman | Bow-tie | Nipple |
|---|--|---|--|---|
| <ul style="list-style-type: none">• Astigmatismo Inverso• Topo/Coma coincidente• Eixo mais plano > 45°• Anel 120/90• Assimétrico-axial | <ul style="list-style-type: none">• Astigmatismo Directo/obliquo• Topo-Coma não coincidentes• Desvio 30 – 75°• Anel 150 | <ul style="list-style-type: none">• Eixo plano horizontal• Topo e Coma perpendiculares• Desvio > 75°• Anel 150 – incisão 180°• Anel 60/60 incisão 90 | <ul style="list-style-type: none">• Astigmatismo Alto• Elevação ant-post similar• Anel 120/120• Simétrico Axial | <ul style="list-style-type: none">• Sem astigmatismo• Central hiperprolato• Anel 210° / ZO 5,00 |



Methods

Inclusion Criteria

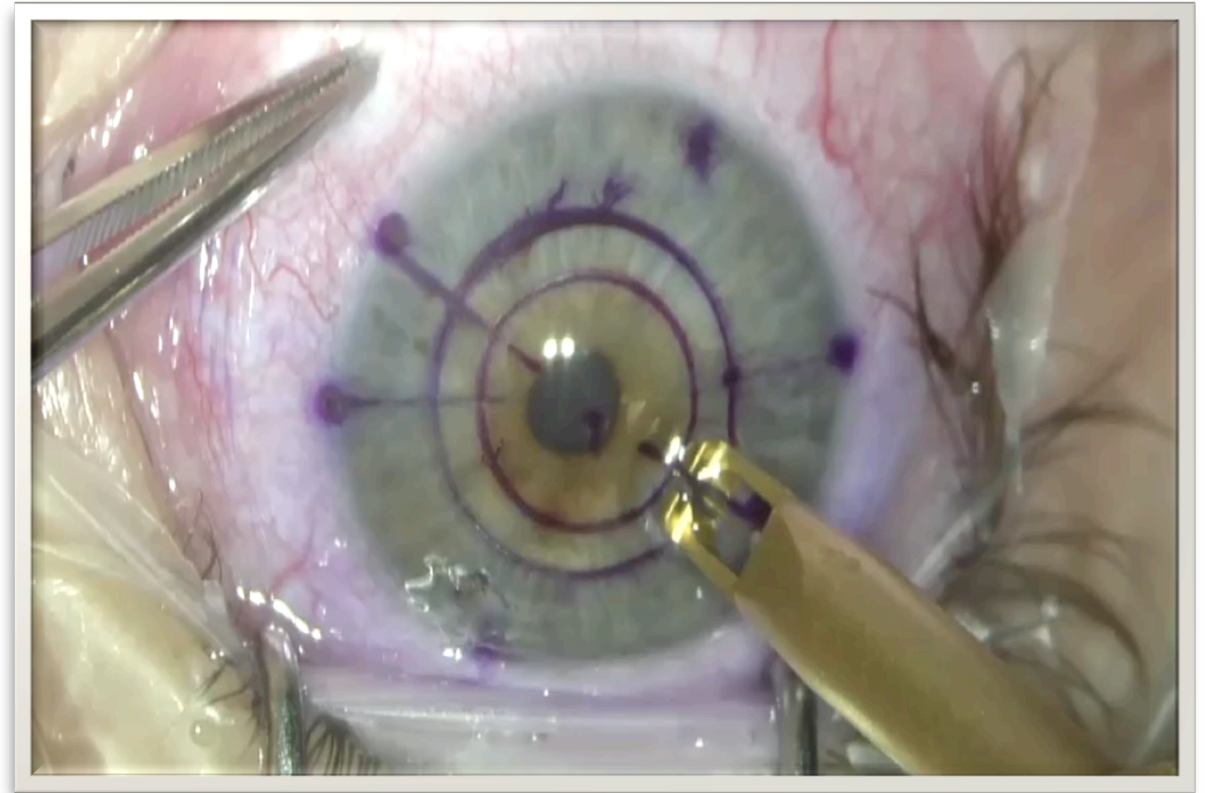
- Keratoconus stage II or III (Amsler-Krumeich)
- Paracentral Ectasia
- Difference between the flat topographic axis and coma axis $< 30^\circ$



Methods

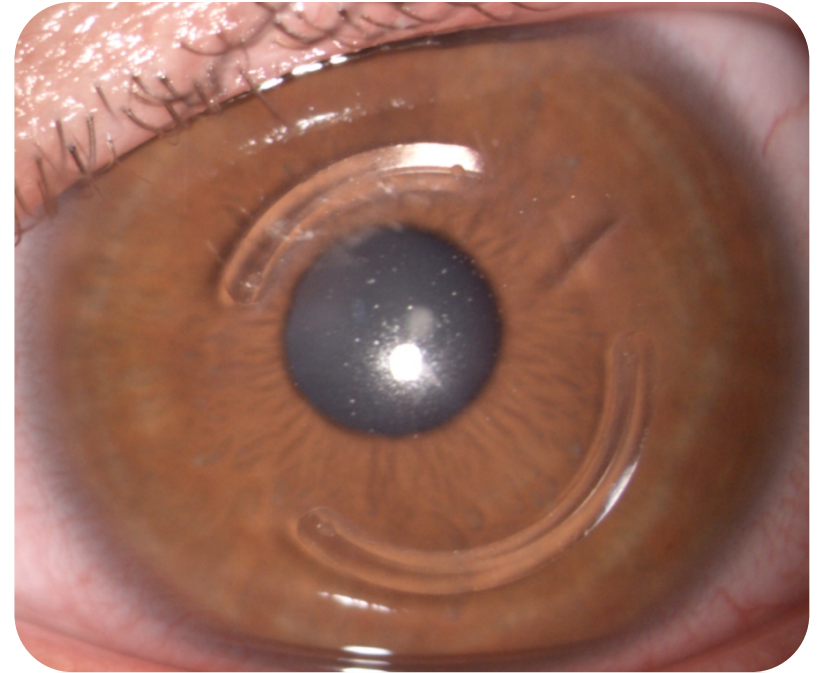
Surgery

- Incision: Steepest meridian
- Depth: 80% of corneal thickness
- Tunnels: mechanical technique
- 1 or 2 Ferrara ICRS



Results

- 17 eyes of 15 patients
- Sex: 6 female; 9 male
- Age: $31,5 \pm 6$ years
- Follow up > 6 months

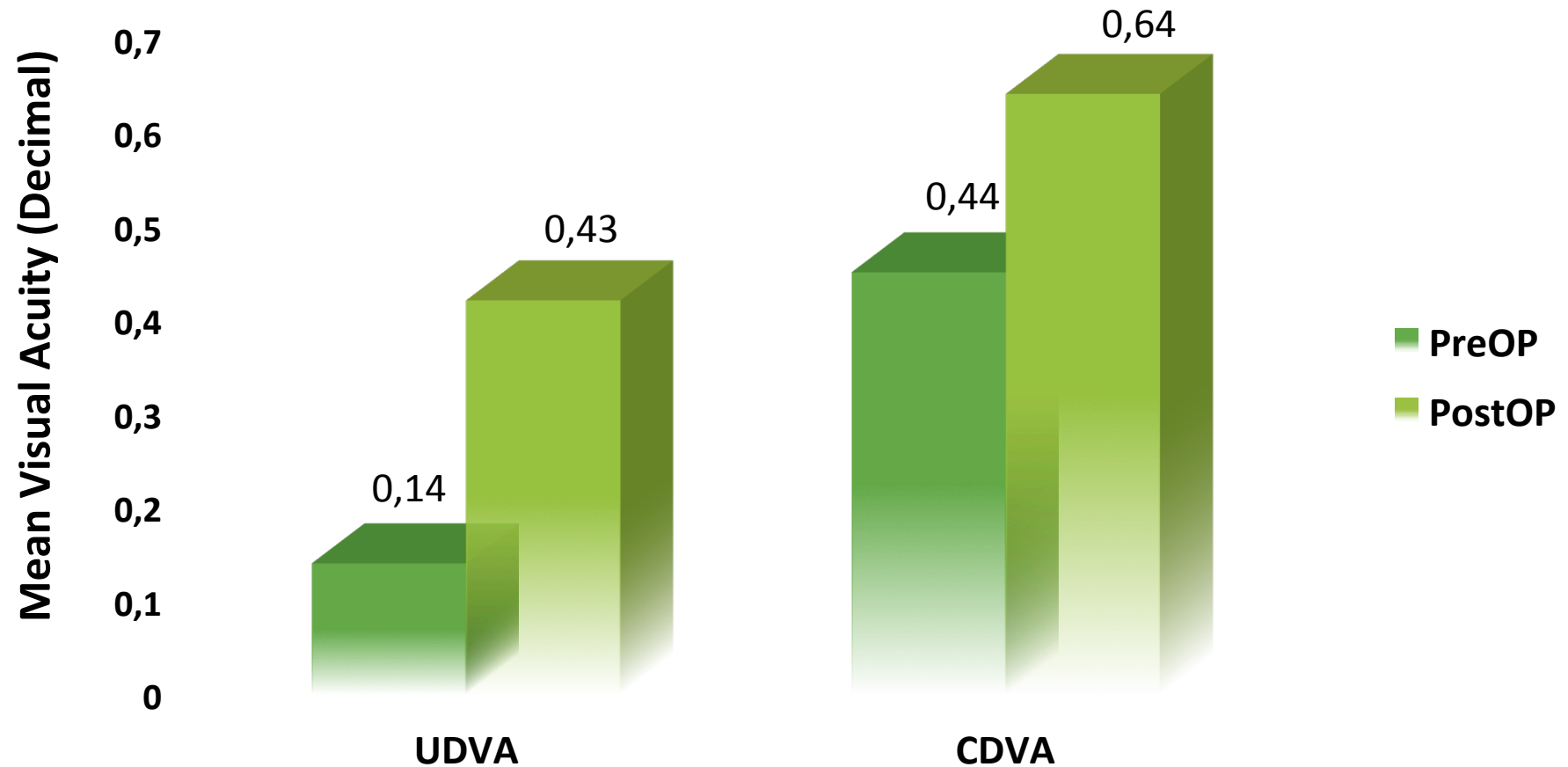


Results

| Mean±SD | PreOP | PostOP | p |
|-----------------------|---------------|---------------|-------|
| Refractive Sphere | -1,38±2,22 D | -0,54±2,34 D | 0,06 |
| Refractive Cylinder | -4,54±2,6 D | -1,54±1,04 D | 0,001 |
| Keratometric Cylinder | 4,8±1,6 D | 1,9±1,2 D | 0,001 |
| Flattest K | 44,64±3,48 D | 44,18±3,6 D | 0,23 |
| Steepest K | 49,37±4,16 D | 46,17±3,6 D | 0,02 |
| Vertical Coma | -3,15±0,96 μm | -1,34±1,47 μm | 0,007 |
| Asphericity (Q) | -0,6±0,6 | -0,4±0,6 | 0,03 |

Results

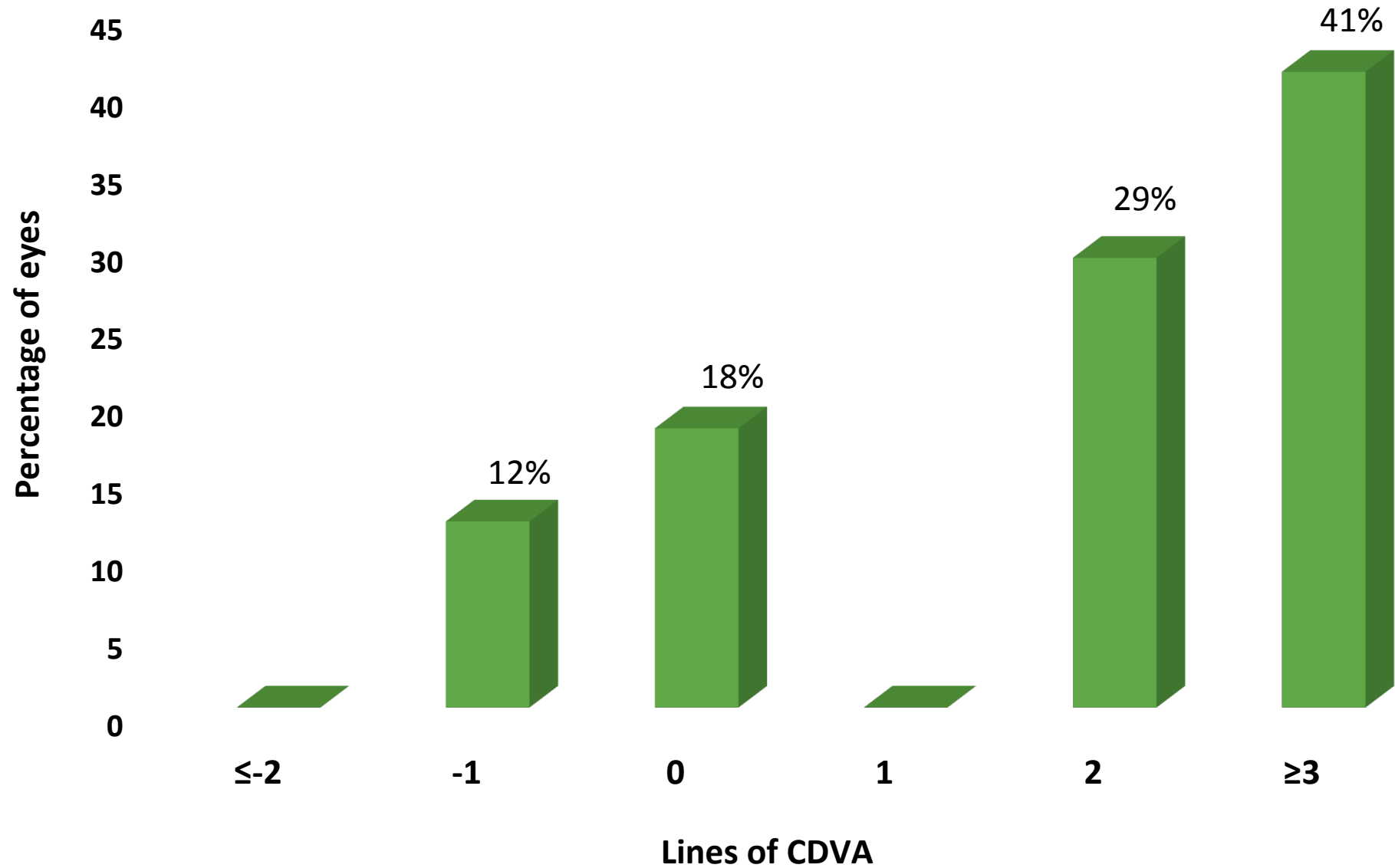
Efficacy



| Mean±SD | PreOP | PostOP | p |
|---------|-----------|-----------|--------|
| UDVA | 0,14±0,07 | 0,43±0,19 | 0,0001 |
| CDVA | 0,44±0,15 | 0,64±0,18 | 0,0002 |

Results

Safety

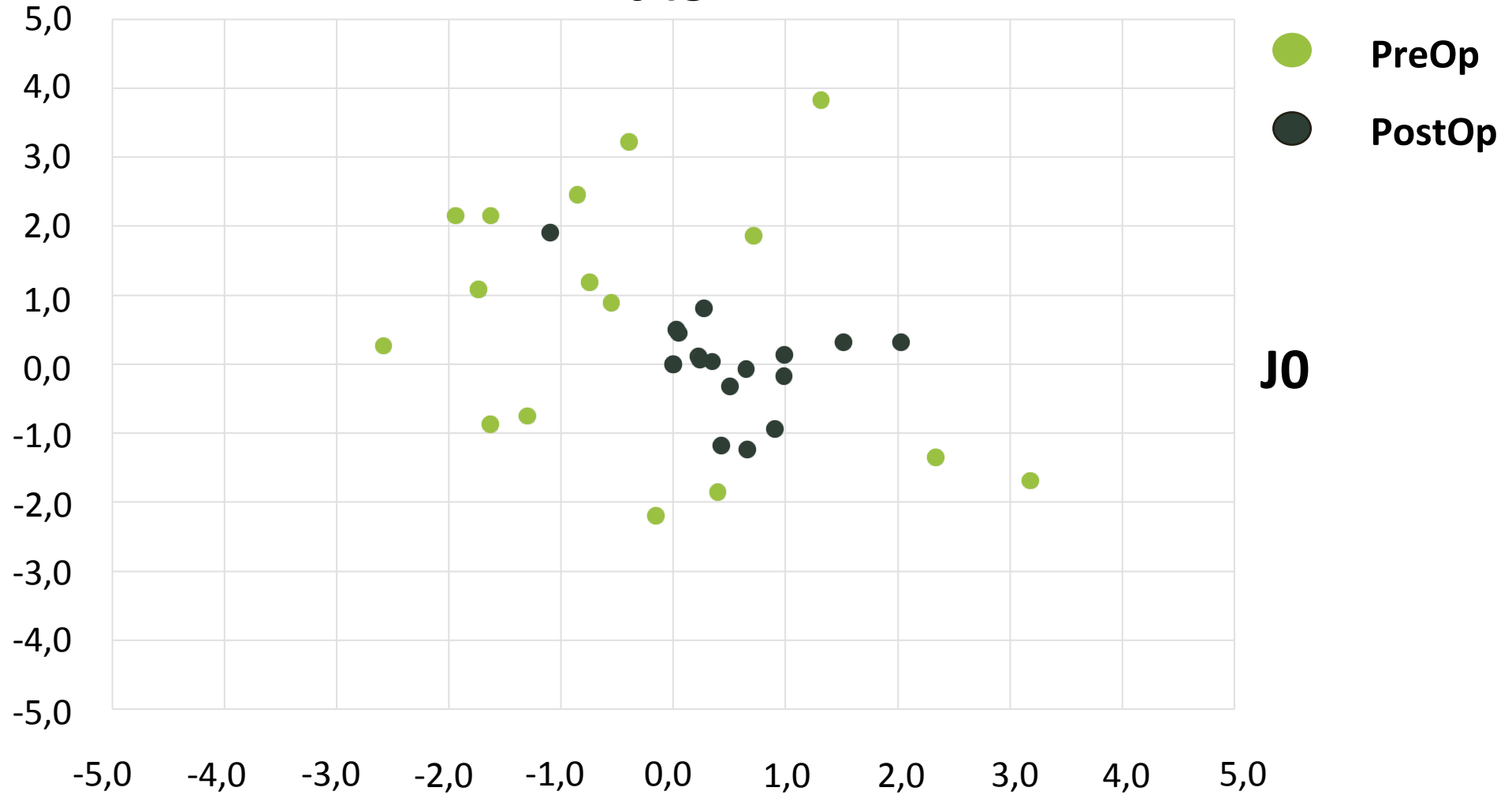


Results

Keratometric Astigmatism

Thibos Vectors

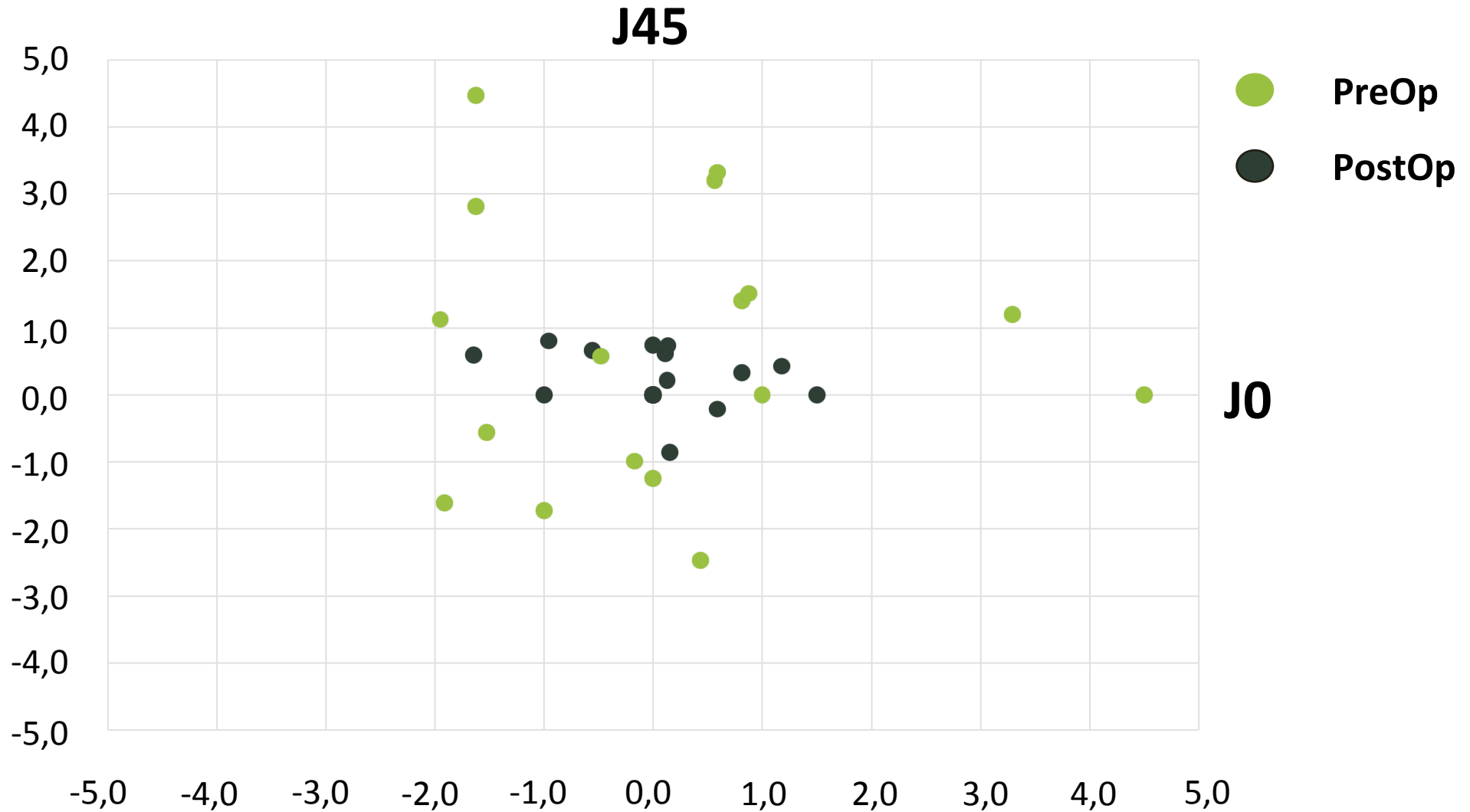
J45



Results

Refractive Astigmatism

Thibos Vectors



Results

Complications

- Intraoperative: tunnel perforation in 1 eye
- No postoperative complications:
 - Infections, extrusions...

Conclusions

- Ferrara ICRS are effective in the treatment of paracentral Keratoconus with coincident topographic and coma axis.
- Mechanical technique is safe with few intraoperative or postoperative complications.
- Longer follow up is needed to evaluate stability.