Correlation of stromal demarcation line depth and topographic outcome after corneal cross-linking with two different treatment protocols.

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The authors have no financial interest in any of the mentioned products

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Is there a correlation between depth of the demarcation line (DL) and the flattening of the cornea?

Differences between treatment protocols have further supported this theory.

To date there is no data available to support this theory.
Methods

- **Study design:** retrospective analysis
- **Inclusion:** progressive keratoconus (Kmax > 48.00 D)
- **Main outcome measures:** central stromal DL-depth (µm), Kmax (Dpt)
- **Tomography:** (Pentacam-HR; Oculus GmbH)
- **Pearson Correlations:**
  - DL-depth (1 month) - Δ Kmax (12 months)
  - DL/CCT Ratio (1 months) - Δ Kmax (12 months)
**Methods**

Two separate groups have been investigated in this trial.

<table>
<thead>
<tr>
<th>Standard Dresden Protokoll (SDP)</th>
<th>Accelerated CXL (ACP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dextran 20% - 30 Minuten</td>
<td>HPMC – 10 Minuten</td>
</tr>
<tr>
<td>UV-X 1000 (Innocross)</td>
<td>UV-X 2000 (Innocross)</td>
</tr>
<tr>
<td>3mW/cm² 30 minutes</td>
<td>9mW/cm² 10 minutes</td>
</tr>
</tbody>
</table>

**Depth of the central demarcation line: flap tool**

Visante OCT (Zeiss)
Results

<table>
<thead>
<tr>
<th></th>
<th>SDP</th>
<th>ACP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>DL-depth</td>
<td>$326.57\pm76.64,\mu m$</td>
<td>$168.74\pm73.15,\mu m$</td>
</tr>
<tr>
<td>DL/CCT</td>
<td>$0.68\pm0.15$</td>
<td>$0.37\pm0.16$</td>
</tr>
<tr>
<td>$\Delta K_{\text{max}}$ (12mo)</td>
<td>$-1.32 \pm 2.20,D$</td>
<td>$-0.77 \pm 2.36,D$</td>
</tr>
</tbody>
</table>

Change $K_{\text{max}}$ after 12 months (SDP)  
Change $K_{\text{max}}$ after 12 months (ACP)
Results: standard protocol

Ratio_{DP} = DL depth / CCT

Correlation: Not statistically significant (p=0.488)
Results: accelerated protocol

Ratio_{DP} = DL depth / CCT

Correlation:
Not statistically significant (p= 0.903)
Results: pooled data

Pearson corr. = 0.127
p = 0.223

Schmidinger, 2016
Results: pooled data

Topographic failures:

\[ p = 0.192 \]
• **No correlation** $(r < 0.2)$ between DL-depth and reduction of $K_{\text{max}}$ was found in either group.

• Accordingly, the **depth of the DL seems not predictive for the outcome** of the procedure in terms of topography change.

• Other factors (individual stromal wound healing) might influence the variable clinical outcome.