

# Multiple-Curve Design Contact Lenses for Keratoconus in Japanese Eyes

## A Study of Rose K2 NC-prescribed eyes

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### Purpose

Lens selection, corrected visual acuity and changes in corneal topography were examined in Japanese eyes that were prescribed with the nipple-cone type Rose K2 NC lens.

### Subjects

Fifty eyes diagnosed as nipple cone type or severe keratoconus were enrolled in the study and corrected visual acuities and changes in corneal topography were evaluated. The base curve (BC), power (P) and diameter (Dia) of their previous contact lenses were also examined.

### Results

- BCs of the lenses prescribed were on average 0.48mm steeper than their previous lenses and consequently P differed by -4.78D. Dia was 0.11mm smaller than their previous lenses.
- In eyes where the previous lens was the Rose K2 lens (41 eyes), BC with the Rose K2 NC lens was 0.34mm steeper, P differed by -3.63D and Dia was smaller by 0.1mm.
- LogMar visual acuities improved significantly from  $0.298 \pm 0.270$  to  $0.195 \pm 0.162$  and in cases with previous Rose K2 use, visual acuities improved from  $0.279 \pm 0.27$  to  $0.187 \pm 0.157$ .
- Corneal topography varied widely and showed no particular pattern.
- Mean keratometric values steepened by  $0.19 \pm 1.24$ mm in eyes prescribed with Rose K2 NC lenses.
- Mean keratometric values flattened by  $0.12 \pm 1.24$ mm in 28 eyes where the Rose K2 lenses were changed to Rose K2 NC lenses.

### Conclusion

The Rose K2 NC is an effective lens in improving visual function in patients with nipple cone type keratoconus and severe keratoconus. One factor in this may be the decrease in contact between the corneal protrusion and the posterior surface of the lens thereby improving the epithelium and comfort. From our data the preliminary base curve of choice should be 0.3~0.5mm steeper than the previous lens.

Case	Before	After						
Case 1	<p><b>Case 1 -Before- Spherical GP lens</b> (2121823(R))</p> <p>0.2 x (Spherical GP lens)</p> <p>40 years old keratoconus patient(♂) shows corneal staining on the apical area with a spherical GP lens wearing.</p>	<p><b>Case 1 -After- Rose K2 NC</b> (2121823 (R))</p> <p>0.4 x 4.50/-30.5/8.4/EL-0.5 (Rose K2 NC)</p> <p>Corneal staining disappeared and VA was improved from 0.2 to 0.4 with the Rose K2 NC lens wearing.</p>						
Case 2	<p><b>Case 2 -Before- Spherical GP lens</b> (2120744 (L))</p> <p>0.4 x (Spherical GP lens)</p> <p>31 years old patient(♂) of the typical nipple cone keratoconus complained of discomfort and also corneal staining on the apical area with a spherical GP lens wearing.</p>	<p><b>Case 2 -After- Rose K2 NC</b> (2120744 (L))</p> <p>0.8 x 5.70/-15.50/8.3/EL-0.5 (Rose K2 NC)</p> <p>Corneal staining disappeared and VA was improved significantly from 0.4 to 0.8 with the Rose K2 NC lens wearing.</p>						
Case 3	<p><b>Case 3 -Before- Spherical GP lens</b> (2131433 (R))</p> <p>0.2 x (Spherical GP lens)</p> <p>32 years old patient(♂) after the acute hydrops. The central corneal thickness was very thin and the spherical GP lens tended to drop during wearing. Topography showed typical nipple cone keratoconus.</p>	<p><b>Case 3 -After- Rose K2 NC</b> (2131433 (R))</p> <p>0.7 x 4.70/-35.00/8.5/EL-0.5 (Rose K2 NC)</p> <p>To avoid the heavy apical touch, Rose K2 NC was fitted steeper than usual but patient felt comfortable and VA was improved significantly from 0.2 to 0.7.</p>						
Case 4	<p><b>Case 4 -Before- Rose K2</b> (2121099 (R))</p> <p>0.7 x 6.90/-6.75/8.7 (Rose K2)</p> <p>60 years old keratoconus patient(♂). Sometimes felt discomfort. Corneal staining was on the apical area with a Rose K2 lens wearing.</p>	<p><b>Case 4 -After- Rose K2 NC</b> (2121099 (R))</p> <p>1.2 x 6.70/-5.50/8.4/EL+0.5 (Rose K2 NC)</p> <p>Corneal staining disappeared and VA was improved significantly from 0.7 to 1.2 with the Rose K2 NC lens wearing. Corneal shape does not change significantly.</p>						
Case 5	<p><b>Case 5 -Before- Rose K</b> (2120731 (L))</p> <p>0.3 x 5.20/-25.00/8.4/Elstd (Rose K)</p> <p>44 years old keratoconus patient(♂). Corneal staining and also scarring were on the apical area with a Rose K lens wearing.</p>	<p><b>Case 5 -After- Rose K2 NC</b> (2120731 (L))</p> <p>0.4 x 4.80/-28.75/8.4/EL-1.5 (Rose K2 NC)</p> <p>Corneal staining disappeared. VA was not improved significantly because of the scarring.</p>						
Case 6	<p><b>Case 6 -Before- Rose K2</b> (2121218 (L))</p> <p>0.7 x 6.10/-20.75/8.4 (Rose K2)</p> <p>61 years old keratoconus patient(♂) were not good condition with wearing Rose K2 lens.</p>	<p><b>Case 6 -After- Rose K2 NC</b> (2121218 (L))</p> <p>0.7 x 5.70/-23.50/8.5/EL-0.5 (Rose K2 NC)</p> <p>VA was not improved significantly. However this patient got to wear all day long because comfort level was improved.</p>						
Case 7	<p><b>Case 7 -Before- SCL + Spherical GP lens (Piggyback)</b> (2130901 (L))</p> <p>0.1 x (SCL + Spherical GP lens)</p> <p>62 years old patient(♂) of post LASIK and the cataract surgery. Corneal staining was on the apical area, VA was not enough and discomfort.</p>	<p><b>Case 7 -After- Rose K2 IC</b> (2130901 (L))</p> <p>0.4 x 6.90/+3.0/10.0/std (Rose K2 IC)</p> <p>VA was improved significantly from 0.1 to 0.4. This patient got to wear about 10 hours long because comfort level was improved.</p>						
<p><b>Visual Acuities (47 eyes)</b></p> <table border="1"> <tr> <td>LogMar</td> <td>Previous CL</td> <td>Rose K2 NC</td> </tr> <tr> <td></td> <td><math>0.298 \pm 0.270</math></td> <td><math>0.195 \pm 0.162</math></td> </tr> </table> <p>Significantly Improved (P&lt;0.1 Wilcoxon)</p>			LogMar	Previous CL	Rose K2 NC		$0.298 \pm 0.270$	$0.195 \pm 0.162$
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