

Keratoplasty fitting with sagittal depth

Michael Baertschi M.Sc., Michael Wyss M.Sc., Simon Bolli eidg.dipl.Augenoptiker, Marc Fankhauser eidg.dipl.Augenoptiker

Introduction

Reverse geometries offer a fascinating approach for fitting (R)GPs after penetrating Keratoplasty (PKP). Due to their unique geometry, the contact lens mimics the topography of a PKP cornea, which allows us to combine the least physiological impact with a superb optical result. Besides starting fitting procedure in the peripheral host cornea, it is important to evaluate the sagittal depth needed to vault the graft-host interface. Central K readings do not reflect any relationship to the peripheral curvature of the host cornea. If a parallel fitting of the central, in general flat graft is achieved, the sagittal depth is not enough deep to vault the graft host interface and the RGP is lifted off in the periphery. If deeper sag is achieved by changing BC only, excessive vaulting of the central cornea will occur, which lead into decreased visual performance and contact lens adherence. Working with reverse geometry offers the unique possibility to influence sagittal depth, by changing the reverse zone only.

Case Report

A 55-year-old female underwent PKP and was fitted with a reverse geometry RGP. The first RGP showed perfect alignment fit in the periphery, but presented excessive central vaulting. (Figure 1)

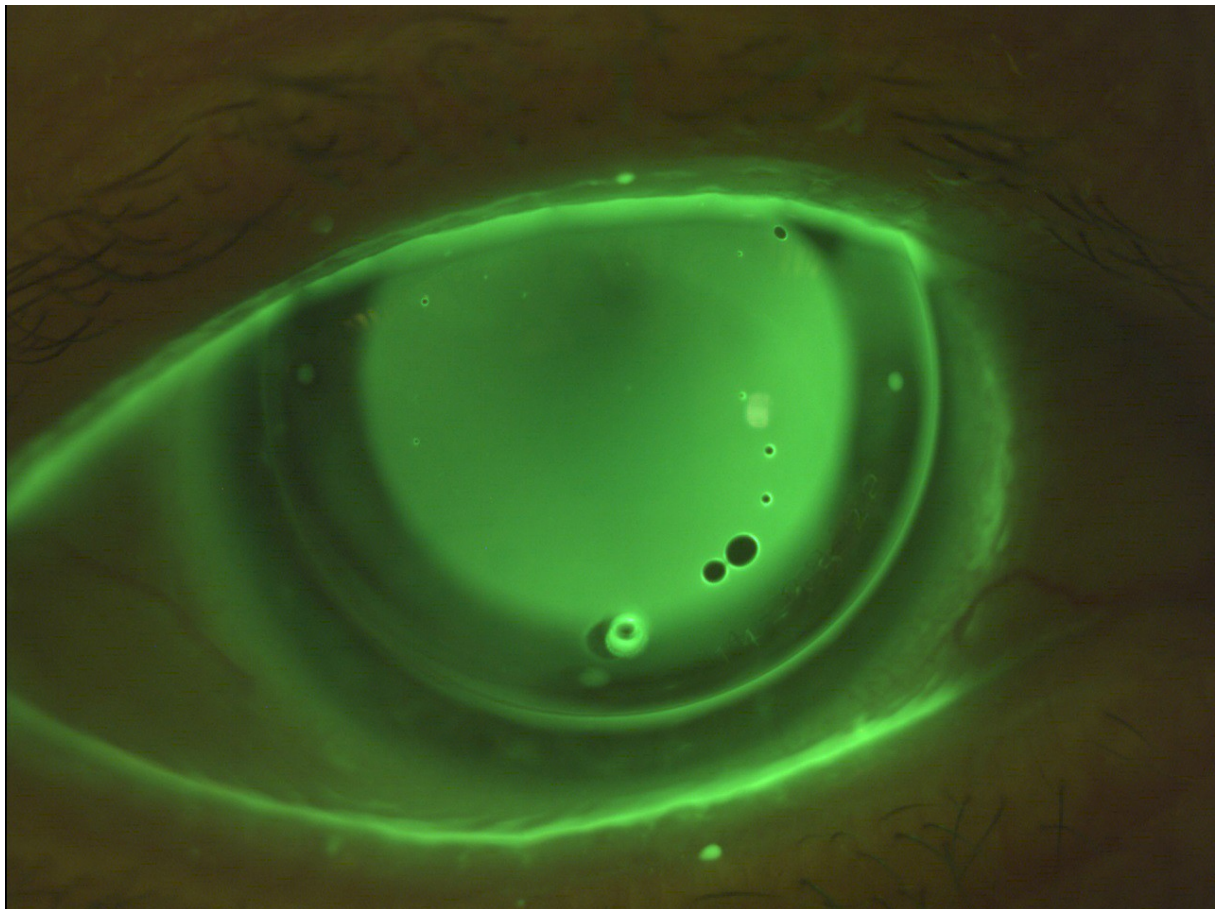


Figure 1: Reverse Geometry V9 with excessive central vaulting.

To reduce sag, there are three options: BC flatter or flatter peripheral fitting, but with these options we have to compensate the whole geometry. For example if you only flatten BC, the periphery will lift off as a consequence. Reverse Geometry now offers the option to only reduce sag, by making the reverse curve smaller. In our example, the first lens had a reverse curve with a additional sag depth of 90micron (Falco Terminology V9) To achieve a better fit, the reverse curve depth was reduced to 40micron (Falco Terminology V4) all other parameters were similar to the previous RGP. (Figure 2)

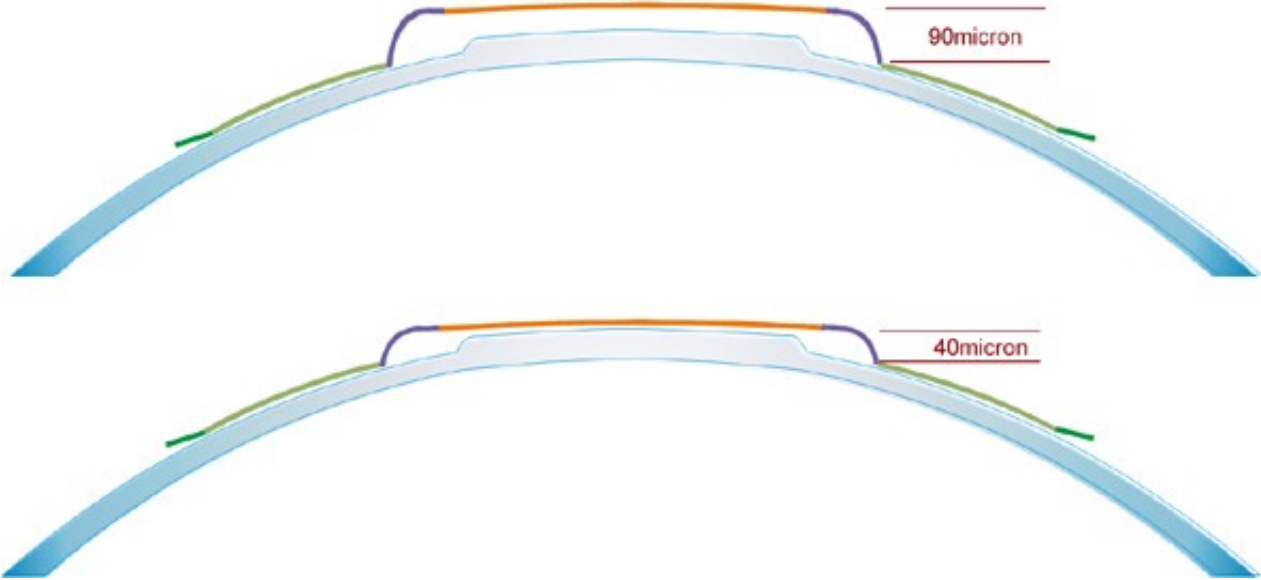


Figure 2: Schematic drawing of sag change V9 to V4.

Fluorescein pattern showed a much better central alignment while the whole peripheral fitting was not influenced in any matter. (Figure 3)

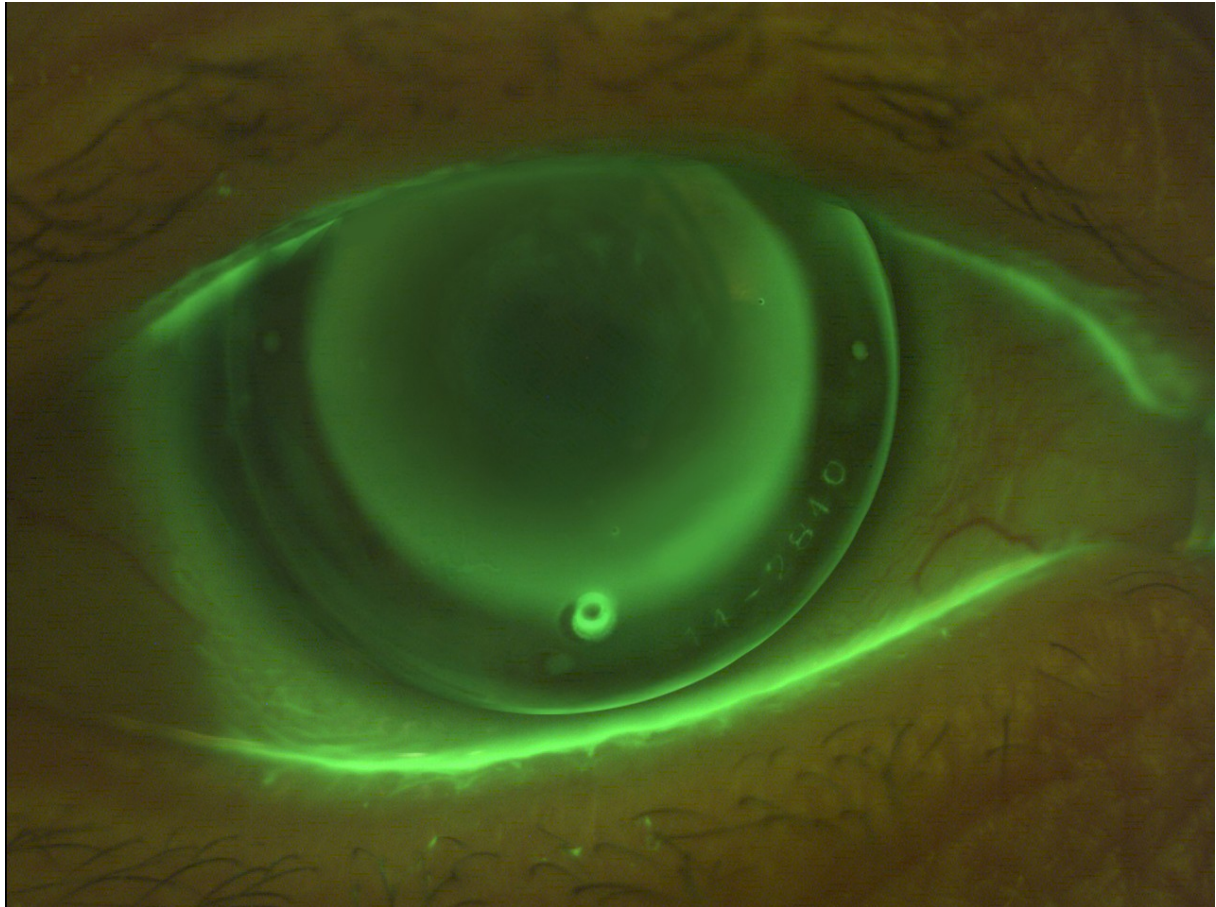


Figure 3: Reverse Geometry V4 with marked reduced sagittal depth.

Discussion

Reverse geometries offer a fascinating approach for fitting (R)GPs after PKP. Due to their unique geometry manipulating sagittal depth by changing the reverse curve is a huge improvement, regarding to simplify the fitting procedure. Our next I-site Newsletter contribution will concentrate on the peripheral fitting possibilities like peripheral toric or quadrant specific designs in PKP cases.