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Troubleshooting Insufficient Orthokeratology Treatment

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Introduction

Orthokeratology provides excellent visual outcomes for many patients; however, sometimes the treatment does not reach the full amount of power to correct the existing myopia completely. Changing the base curve of the lens to increase the myopic correction does not provide a better outcome in such cases. It is not a matter of miscalculation of the treatment curve, but more the insufficient adhesion forces during the treatment. In this case report, we will discuss the possible troubleshooting strategies for a patient with moderate myopia and astigmatism.

Case Report

A 22-year-old male started with toric orthokeratology treatment 1 month ago, but his right eye did not achieve vision as clear as the left eye. The starting point was the following refraction: $-3.75D = C -2.0D$ axis 6° ; Figure 1 shows corneal topography with regular with-the-rule astigmatism.

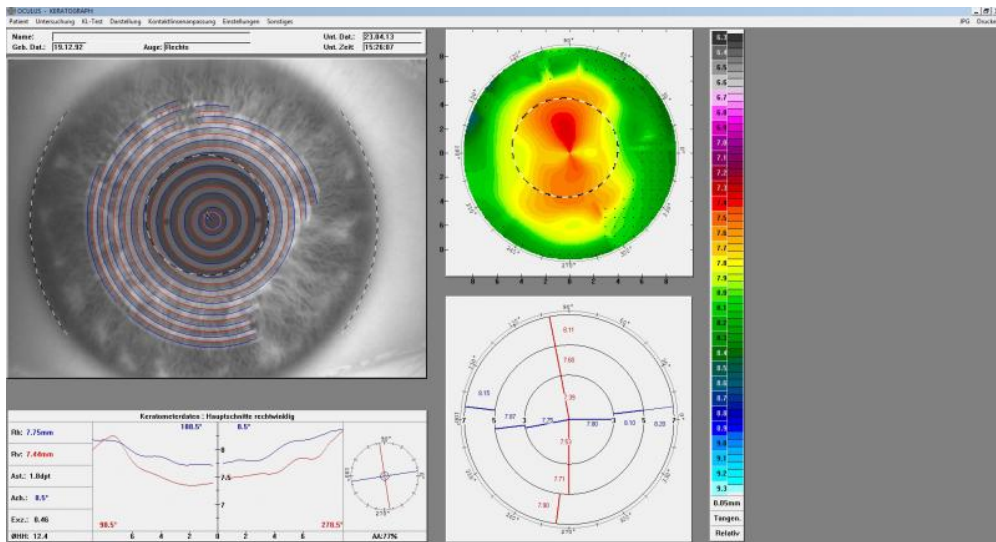


Figure 1: Baseline corneal topography

Subjective refraction showed $-0.5D$ OD VAcc 1.0 with lots of shadowing and plano OS VAcc 1.25. Topography showed a typical, well-centered pattern after toric orthokeratology treatment (Figure 2).

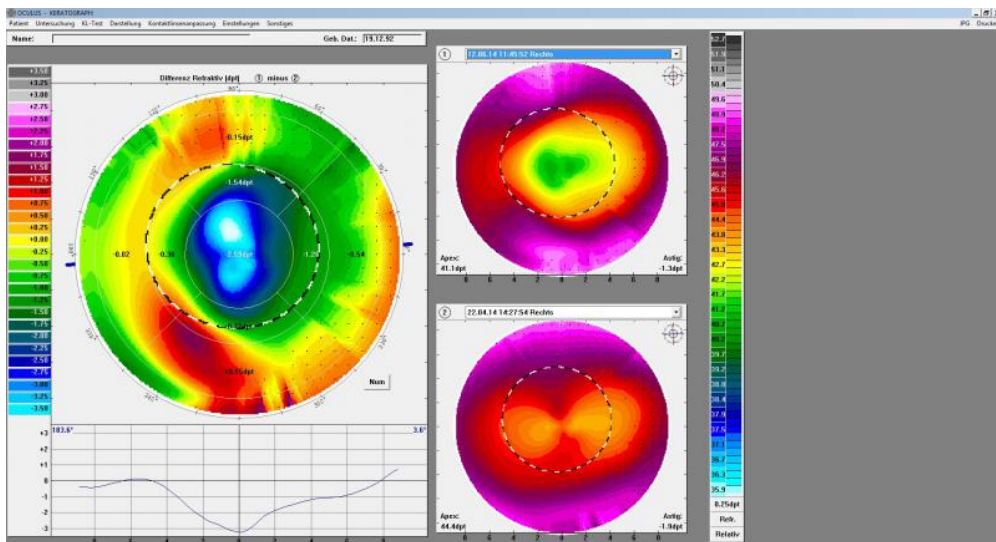


Figure 2: Topography after 1 month of toric orthokeratology

However, the useful optical zone diameter was quite small, and together with the residual myopia, the visual outcome was not acceptable. To ensure that the calculation of the treatment base curve was correct, over-refraction with the contact lens in place was performed, which resulted in plano VAcc 1.25. So the goal here was to enhance the adhesion forces between the contact lens and the

cornea during the wearing time. By simply decreasing the treatment zone diameter from 6.0mm to 5.8mm, the volume of the reverse curve was decreased, which increased the adhesion forces. At the final follow-up consultation, after 1 month of wearing time, the patient reported a much better visual outcome. The topography showed a substantially increased optical zone diameter and the correct amount of myopia treatment (Figure 3).

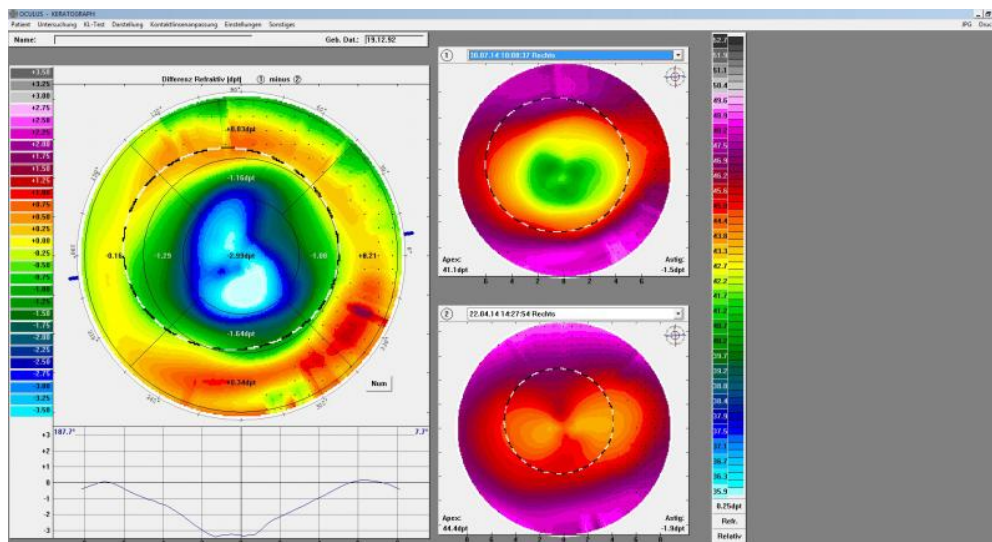


Figure 3: Topography after introducing a smaller treatment zone

Subjective refraction of plano and VAsc 1.25 confirmed the topography measurements.

Discussion

A perfect fit of the contact lens with good centration and alignment is key in orthokeratology. However, sometimes an insufficient treatment result can occur despite a perfect fitting pattern. Increasing the adherence forces by decreasing the treatment zone diameter can help to ensure that the contact lens applies the full amount of treatment forces to the cornea. As a consequence, the useful optical zone diameter, as well as the amount of corrected myopia, will increase, and this will result in a better visual experience for the patient.



Michael Baertschi

Michael Baertschi was the senior optometrist at the University Eyehospital Basel from 2000 to 2007. He is the owner of Kontaktlinsenstudio Baertschi in Bern, Switzerland and the CEO of Eyeness AG in Bern. Michael graduated from Pennsylvania College of Optometry as MSc Optom. and from the University of Bern as Mmed in Education and he did his PhD in Biomedicine at Salus University in the USA. Michael is a fellow of the American Academy of Optometry and president of the Swiss Interlens group.



Michael Wyss

Michael Wyss graduated from Olten SHFA in Switzerland and did his MSc at the Hochschule Aalen Germany (in cooperation with New England College of Optometry and Pacific University, USA). Since 1999 he has worked in a private practice (kontaktlinsenstudio Baertschi in Bern, Switzerland) as Optometrist for specialty contact lens fitting. Additionally, he is an adjunct Faculty Member at the New England College of Optometry USA, Hochschule Aalen Germany, TVCI in Prague (Czech Republic) and FHNW Optometry in Olten Switzerland. Michael is a clinical investigator for several industry partners and has published or lectured on several topics in the contact lens field throughout the world. Michael is a Fellow of the American Academy of Optometry and serves as the vice chairman of the Admittance Committee for new Fellows outside the USA.

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