

# CALCULATED LENS VERSUS FITTED LENS IN ORTHOKERATOLOGY: CAN THE CHANGES BE PREDICTED?

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## OBJECTIVE

Comparison of a spherical design (OK) versus different peripheral sagittal depth design (OKDA) in terms of changes needed from the initially calculated lens and the lens that is finally fitted.

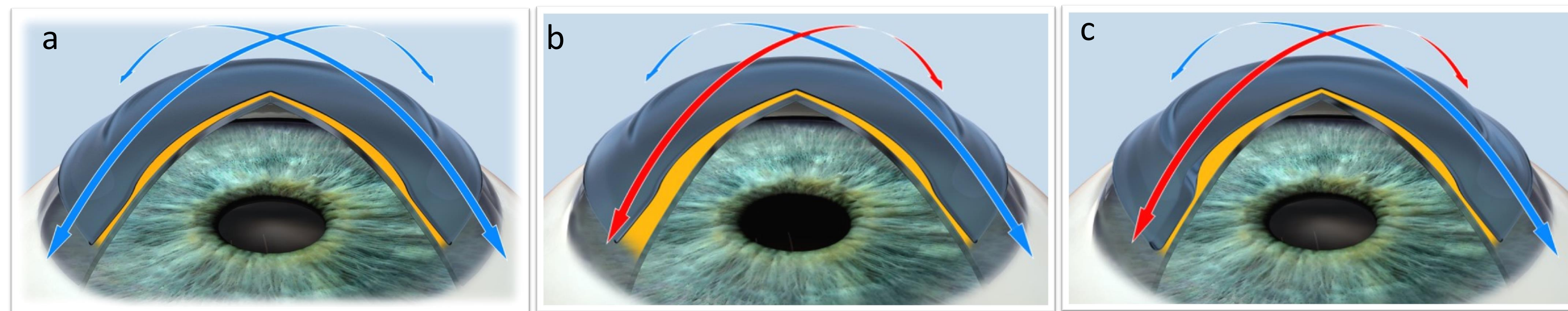
## METHODS

Experimental, prospective and longitudinal study for 12 months follow up.

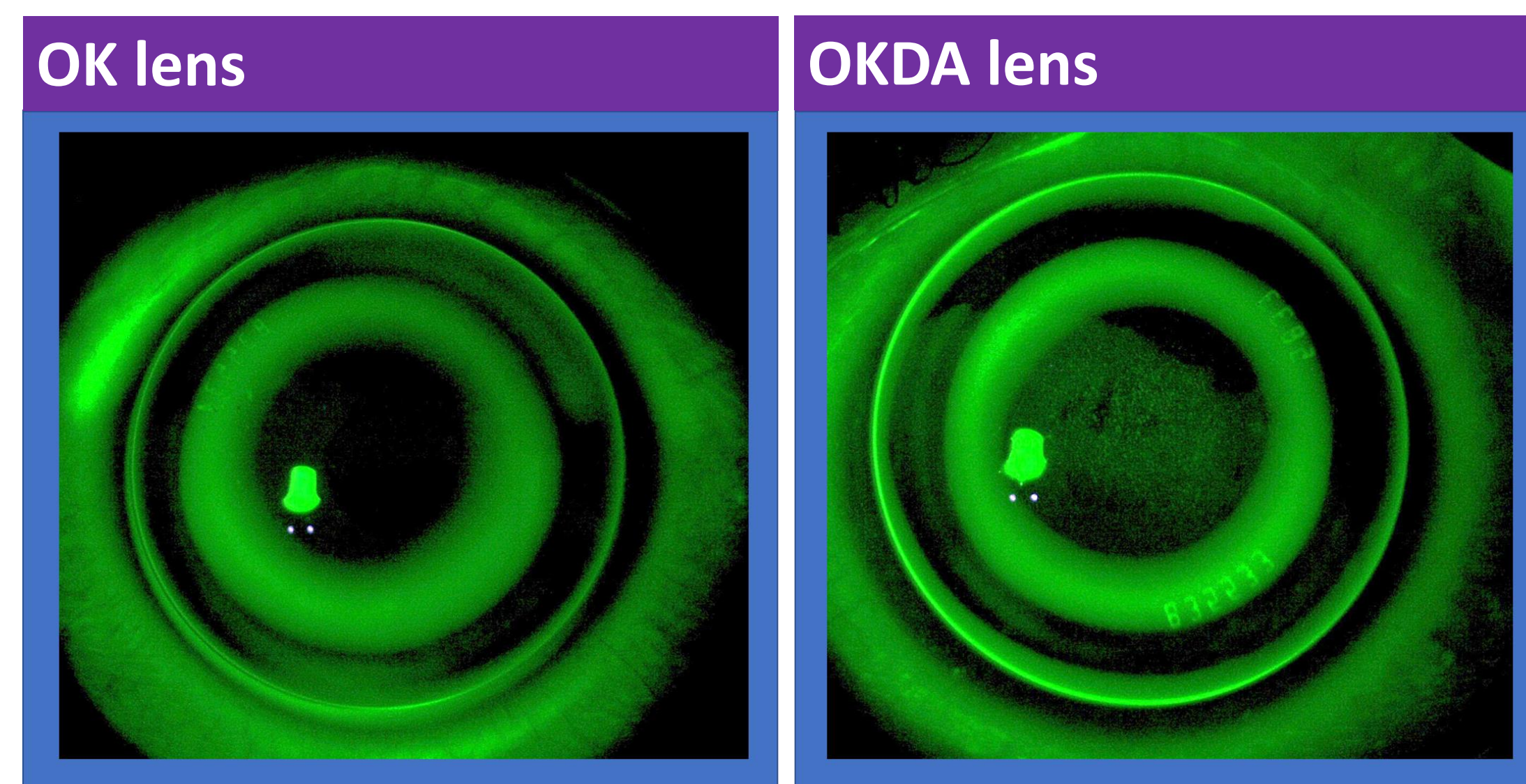
Sixty-four patients (25 male and 39 female) aged  $12 \pm 2.53$  years old and spherical equivalent of  $-1.62 \pm 2.06$  D were fitted with spherical orthokeratology contact lenses (OK) and with different sagittal depth in both eyes (OKDA) in each eye, randomly. (Image 1)

The calculation of the lens was made taking in account the flat K obtained from the Oculus Pentacam and the sphere obtained from the subjective refraction. Based on the results of fluorescein pattern (Image 2) evaluation of the calculated lens, parameters changes were made to determine the best fitted lens.

**Image 1.** Spherical cornea with spherical OK lens; b. Toric cornea with spherical OK lens; c. Toric cornea with different sagittal depth OK lens



**Image 2.** Fluorescein pattern

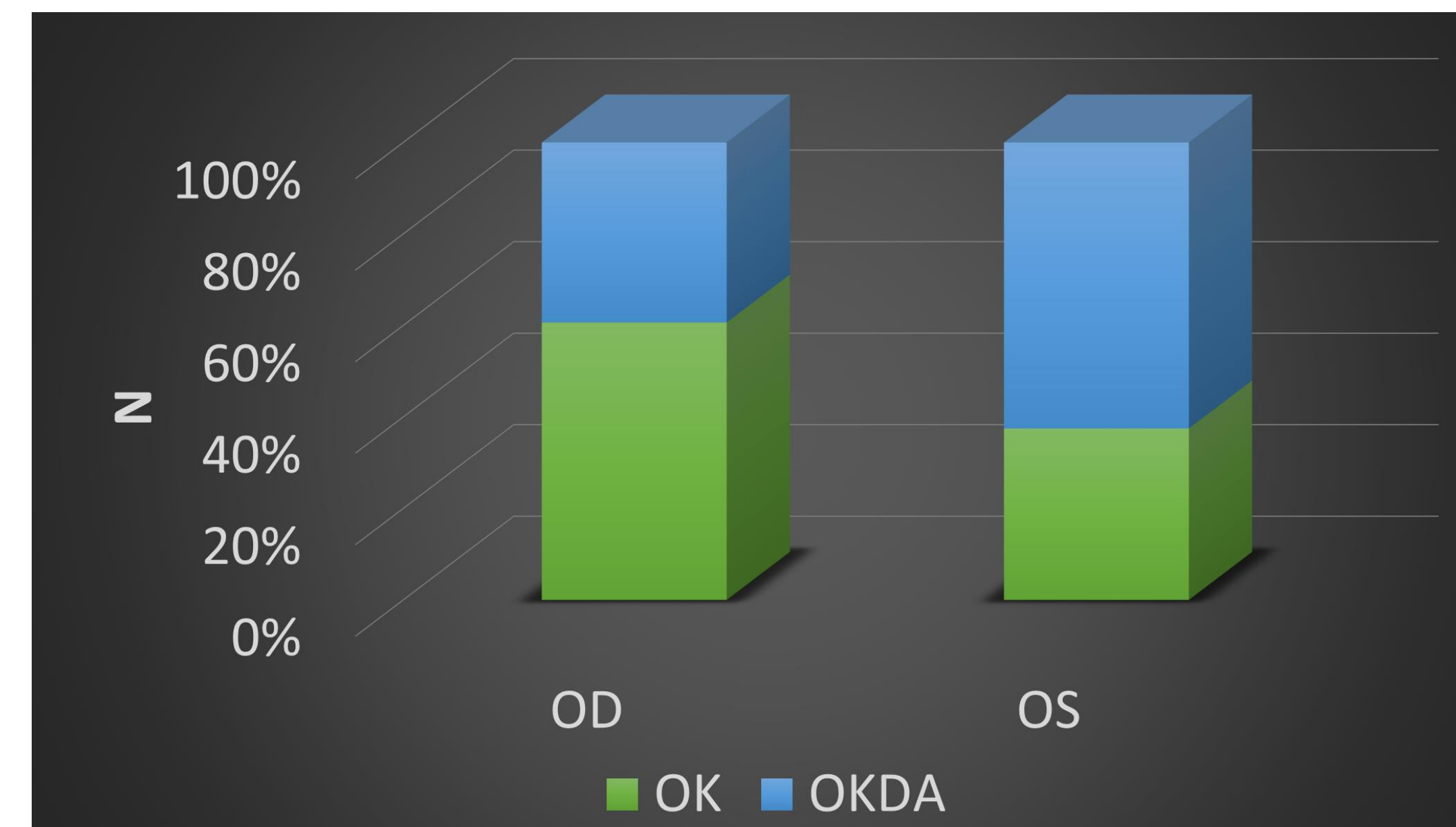


## RESULTS

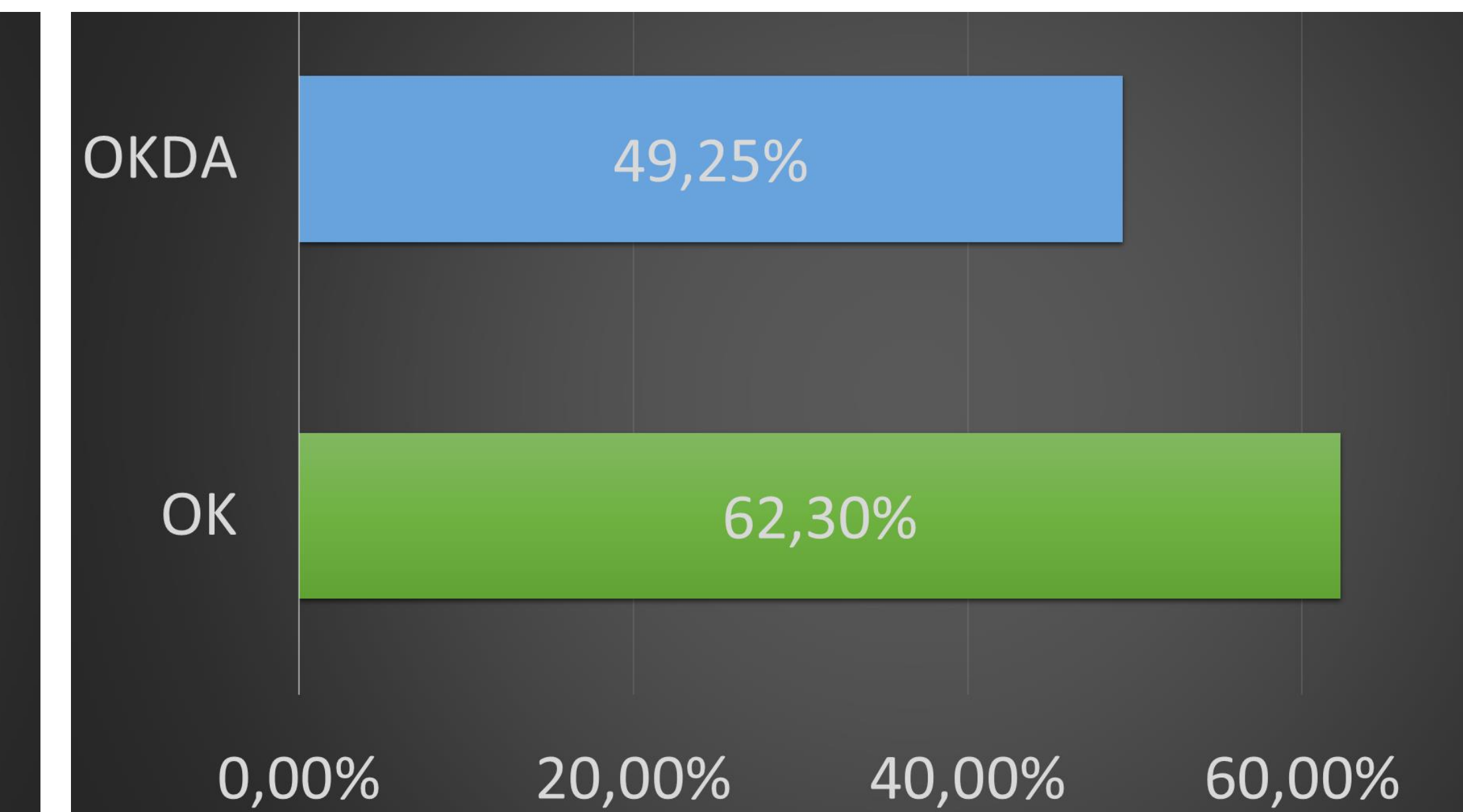
OK design was fitted in 37 right eyes (OD) and 27 left eyes (OS). OKDA was fitted in 24 OD and 40 OS (Figure 1). The total of eyes fitted with OK (RE = 37 and LE = 24). There were no parameter changes between the calculated lens and final lens fitted in 62.30% for OK compared with 49.25% for OKDA (Figure 2). The changes needed for OK (Figure 3), 17.39% were changes only in the base curve, 4.35% only in the return zone depth, 21.74 % only in the landing zone angle and 4.35% only in the overall lens diameter. The rest of lenses with changes (52.17%), more than one parameter was modified. For OKDA (Figure 4), 26.47% required changes only in the base curve, 2.94% only in the return zone depth, 35.29% only in the landing zone angle and no change in the overall lens diameter. The rest of lenses with changes (35.29%), more than one parameter was modified. After 12 months of lens wearing, 13.11% of eyes with OK lenses were refitted with OKDA, being only the 1.49% of eyes with OKDA refitted with OK (Figure 5).

## RESULTS (continued)

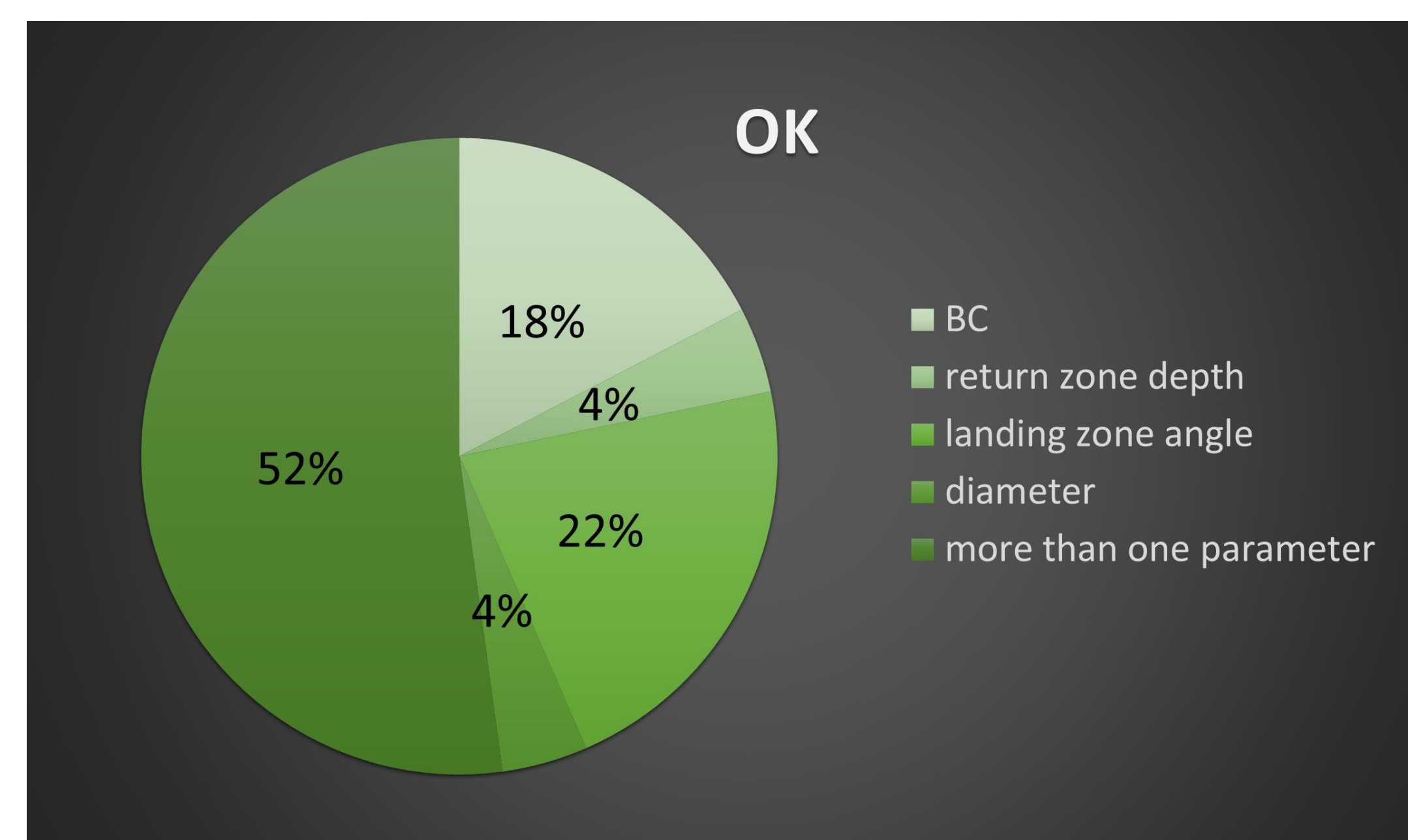
**Figure 1.** OK design fitted in each eye



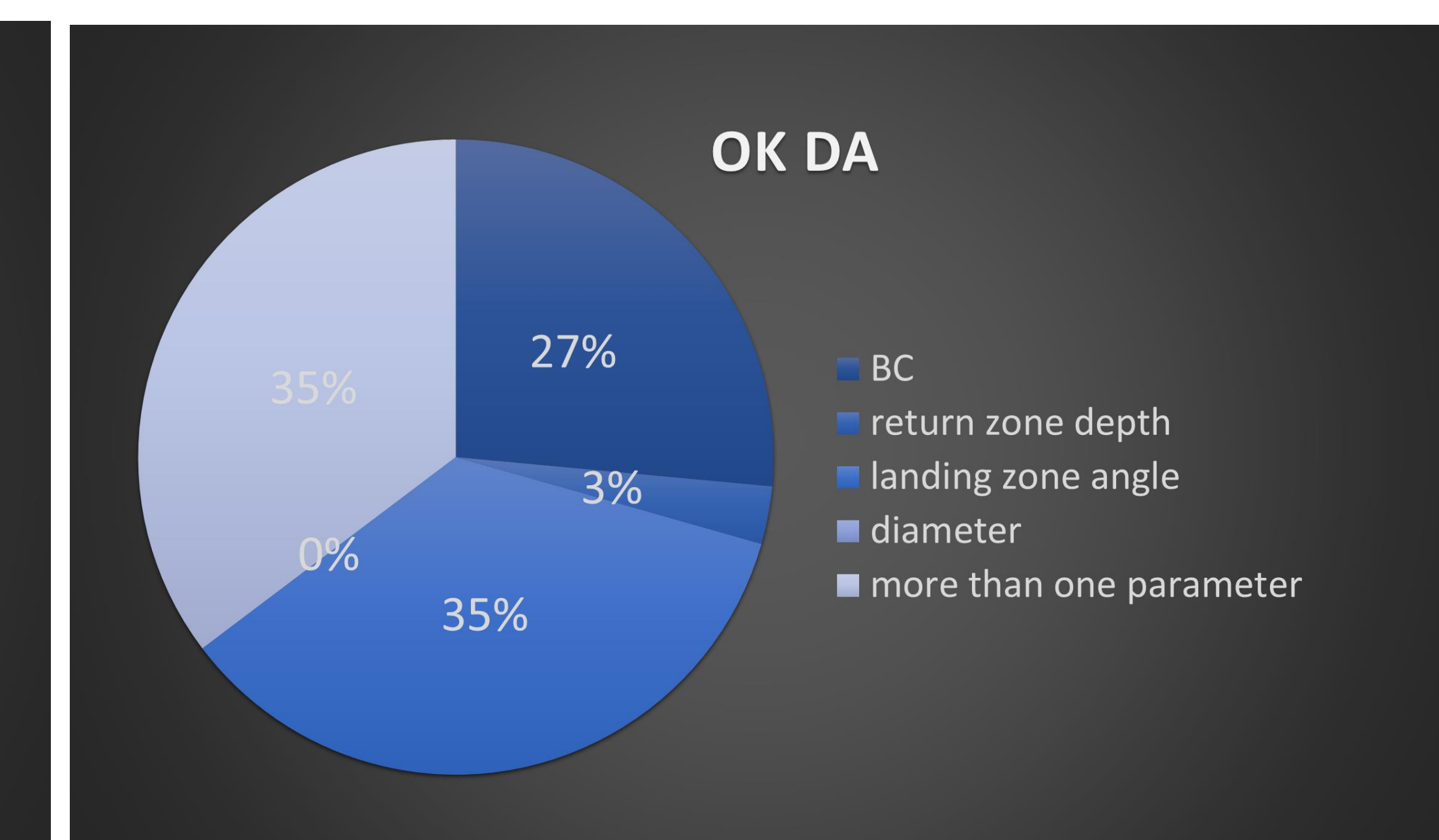
**Figure 2.** Differences between calculated lenses and final lenses fitted



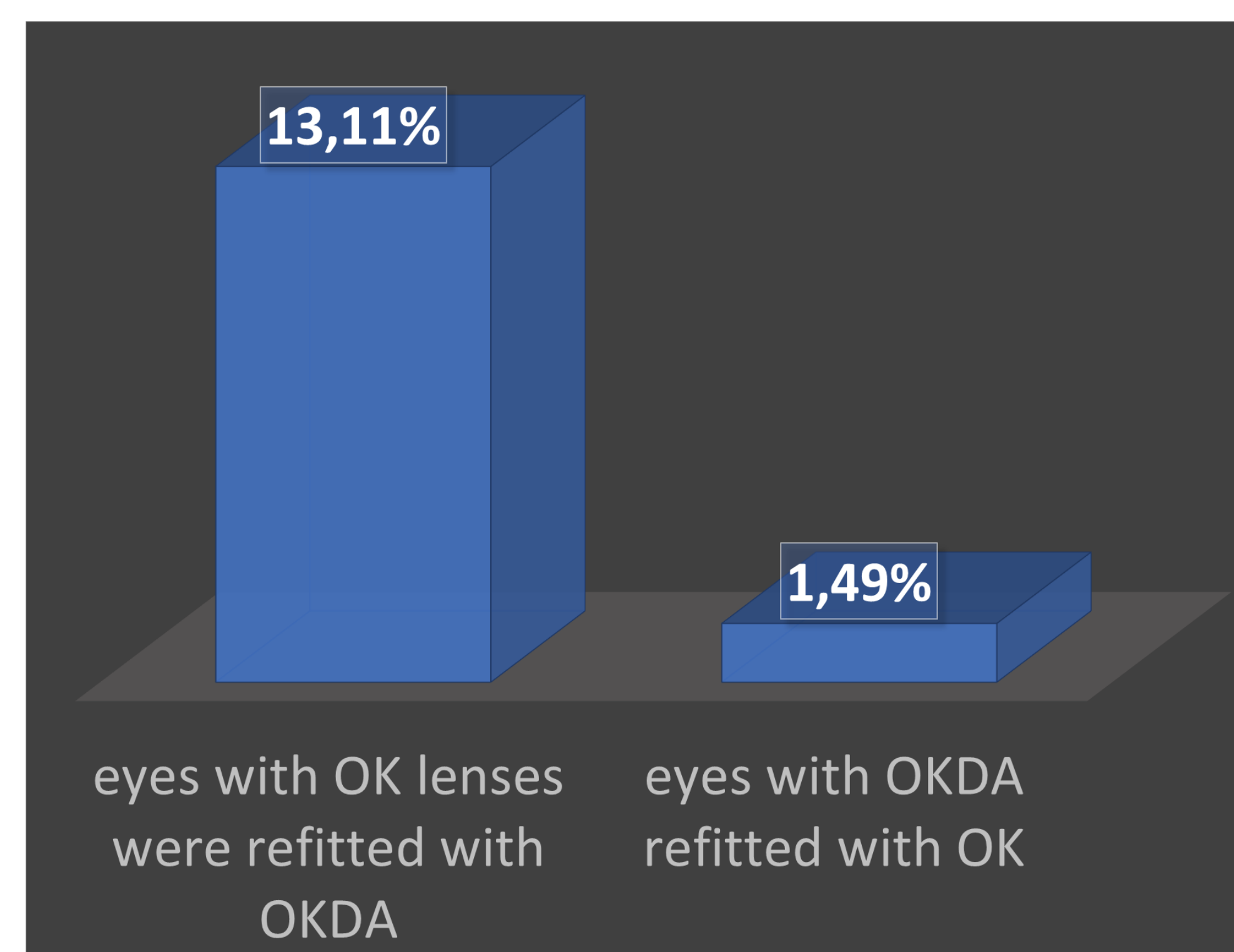
**Figure 3.** Changes needed for OK



**Figure 4.** Changes needed for OK DA



**Figure 5.** Refitted lenses after 12 months wearing



## CONCLUSION

There are different methods to calculate the final lens fitted, the method suggested by the manufacturer has shown a high precision to determine the final lens fitted. However, the largest number of changes in both designs of contact lenses was in the landing zone angle. It could be interesting to take in account the corneal eccentricity and toricity to improve the calculation because there are many types of astigmatism, since regular and irregular astigmatism to central or Limbus to Limbus astigmatism.

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