





Objectives:

Dental operating microscopes (OPM) are becoming more and more used, not only in difficult clinical procedures but also in many treatment procedures of restorative dentistry, endodontics, periodontics, microsurgery etc. For ergonomic reasons, position and size of OPMs should be adjusted to individual operators' correct working positions to allow optimal muscular and visual working conditions.

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Methods:

Thirty subjects recruited from microscope training programmes with body heights from 146 to 202 cm were assessed concerning the individual horizontal and vertical distances from the ocular of the microscope to the operating field in a home-position as well as in ergonomically optimized position. The differences between the individual home-position and ergonomic ideal positions were statistically analyzed (t-test, p<0.05), and multivariate analysis was used to determine dependend factors of an optimal ergonomic position. These results were transfered to an ergonomic configuration of the Zeiss OPMI pico microscope.

Results:

Deviation values of horizontal and vertical distances between the individual home and ideal position, based upon body heights and sitting proportions, were normally in the range of 12 - 22 mm. In contrast, other individual deviation values were in the range of 30 - 50 mm. Subjects of body height <170 cm were in the group of low deviation between the 2 positions, whereas subjects >170 cm performed with the greater deviation. The vertical adaptation of the microscope to individual body height was limited under the ideal test condition of 0° ocular inclination.

Conclusions:

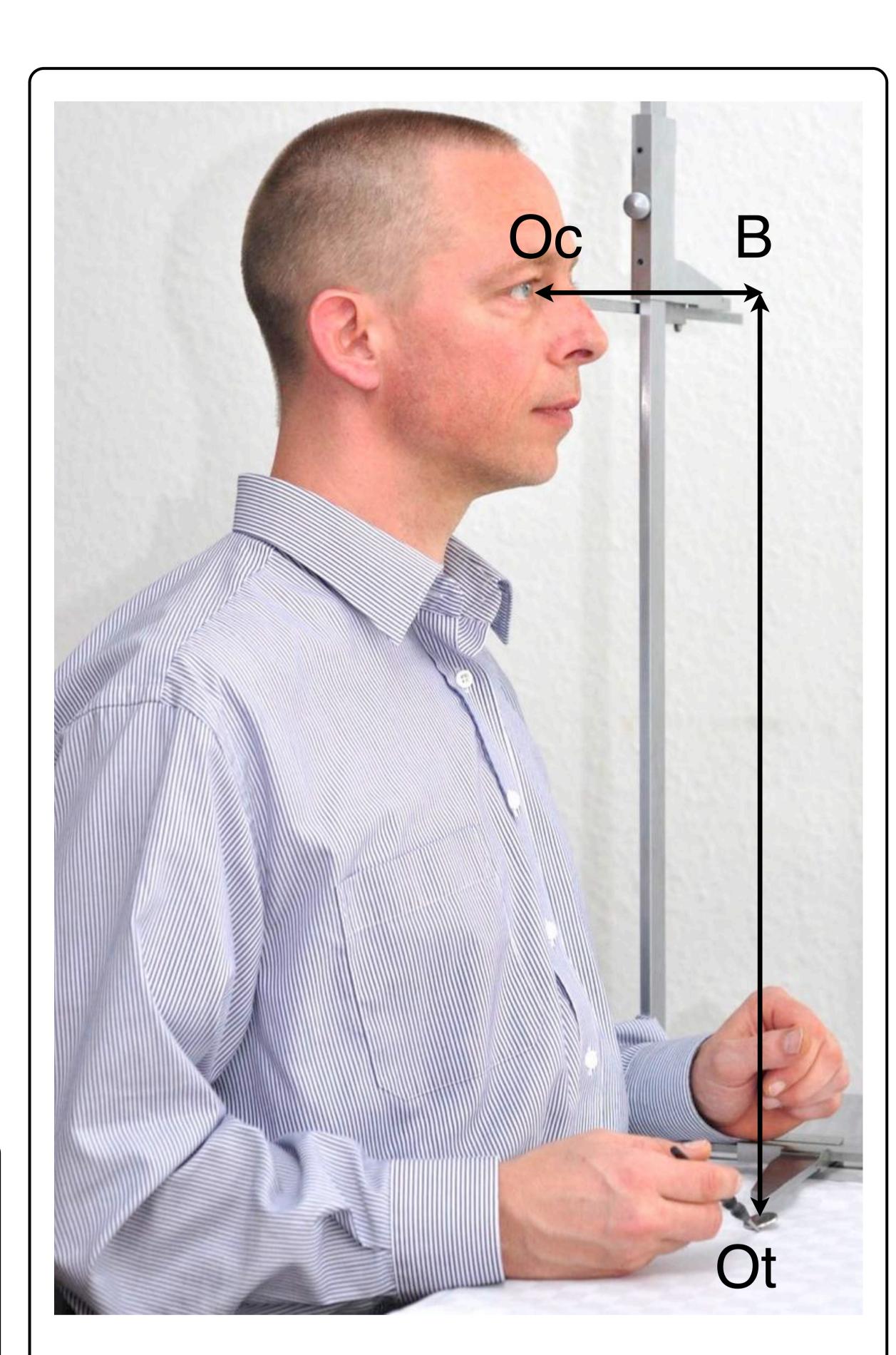
Due to the high deviation between individual home-position and ergonomic ideal position each subject should be seen as an individual operator who needs personal adaptation to a microscope system. Therefore, anthropometric data of operators, measured individually in home position and ideal position should be used for the best configuration of OPMI components.

Vertical limitations concerning the sitting height can be eliminated by inclination of the ocular from 0° up to 30°, still fulfilling ergonomic parameters of optimal working position. The MORA interface and the Foldable Tube in different positions contribute to the individualized ergonomic workflow. Further studies are needed to correlate the most important anthropometric data with the best OPMI configuration.

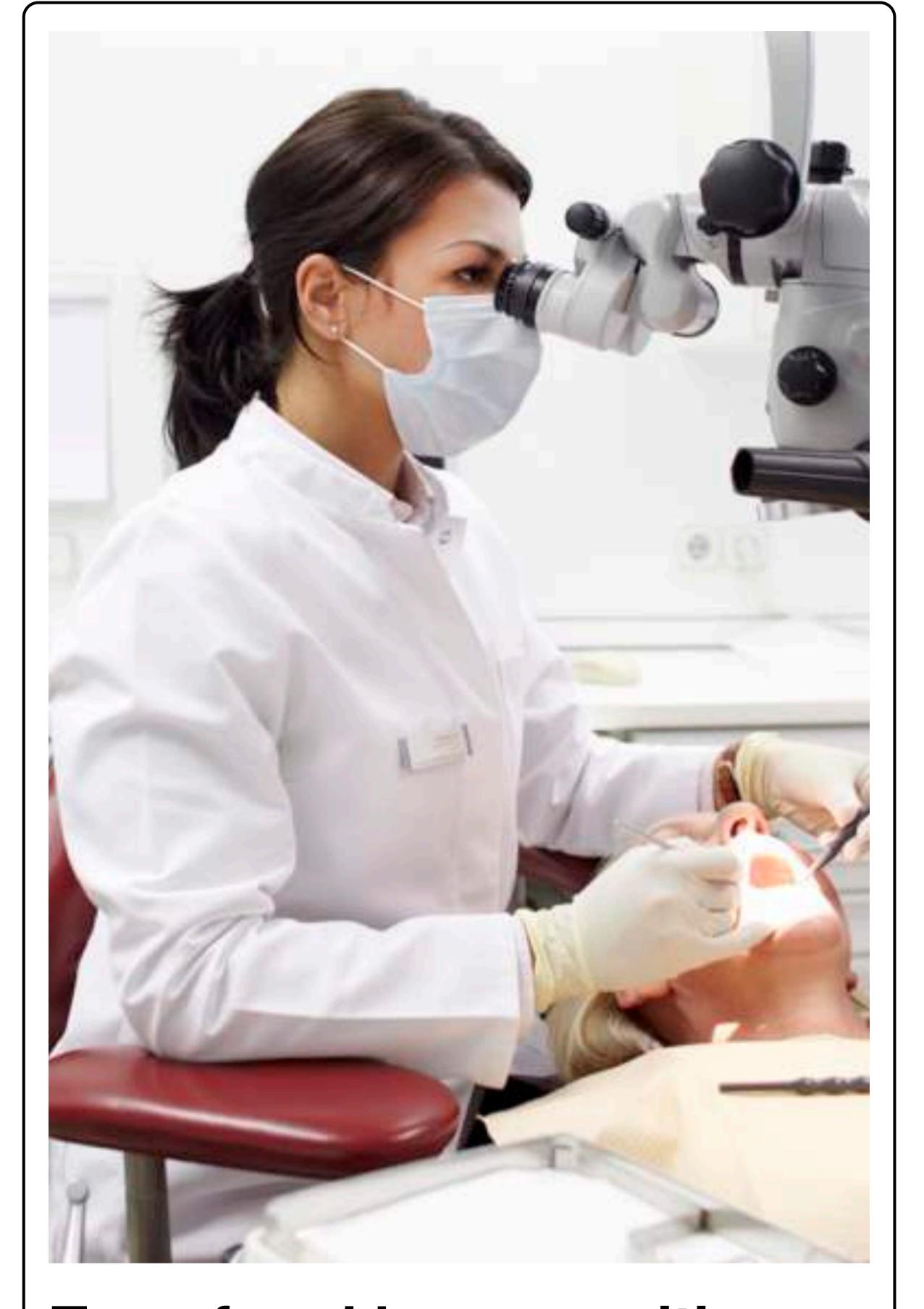
Sponsored by Carl Zeiss Meditec, Oberkochen, Germany

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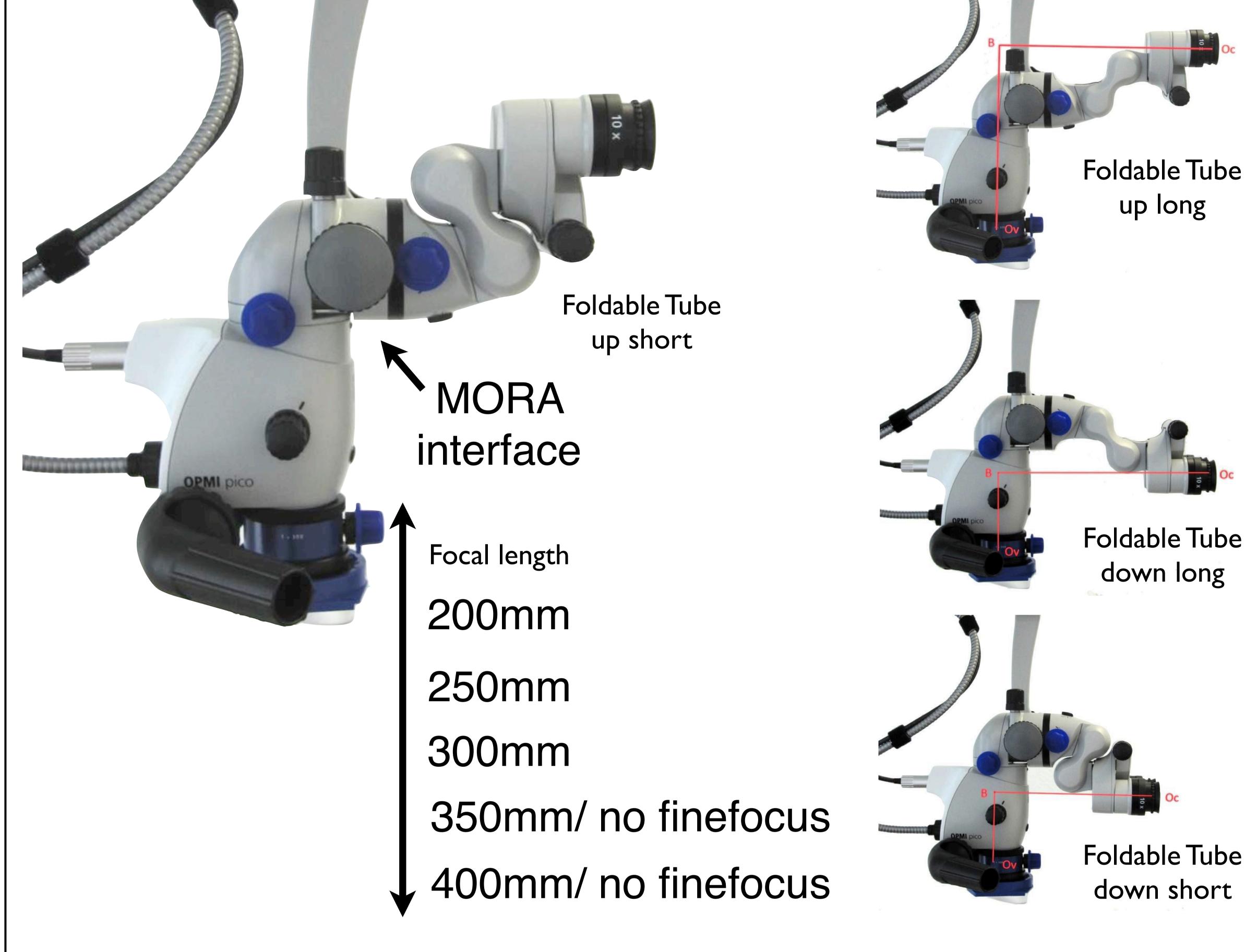
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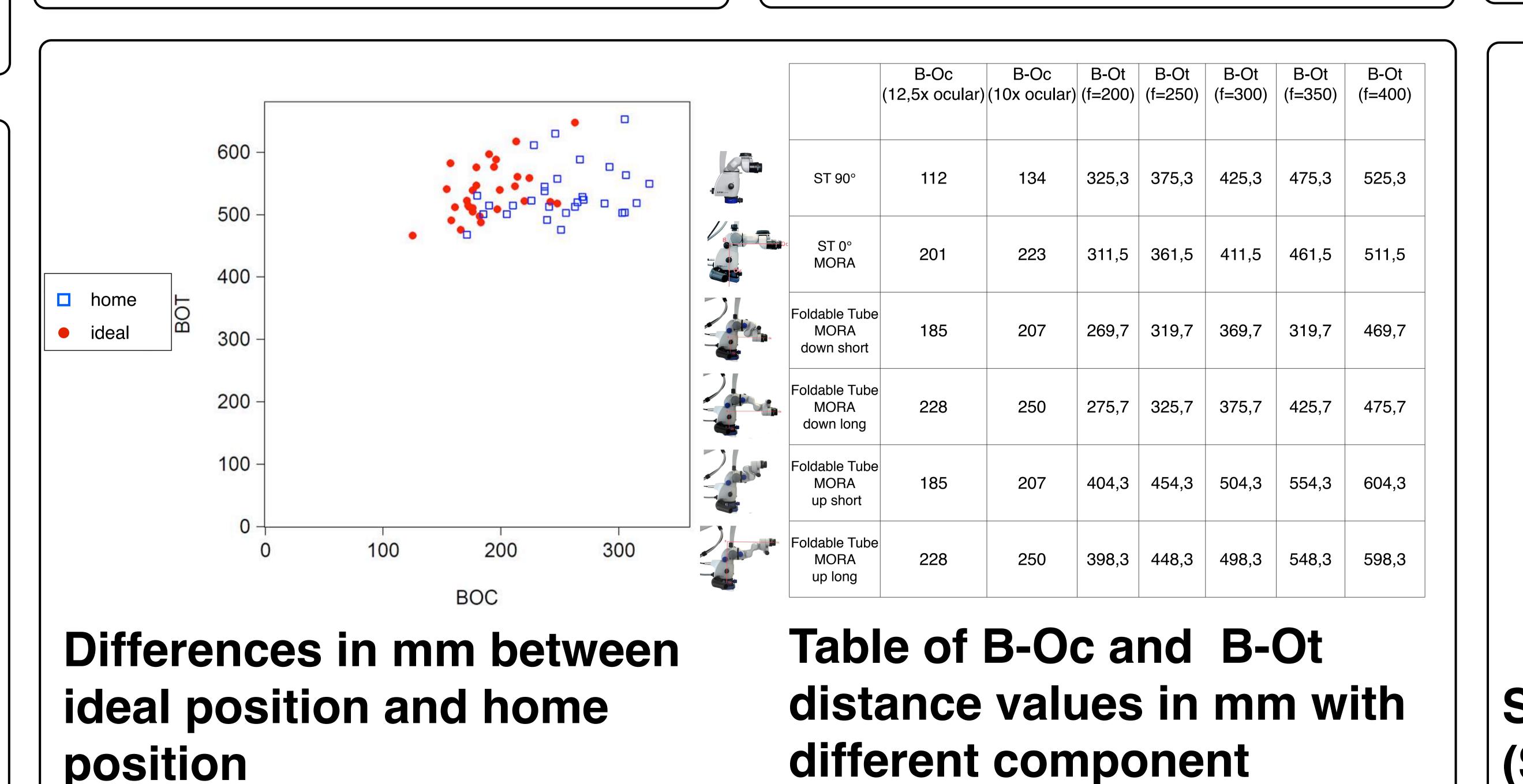


Subject seated and measured in ideal position

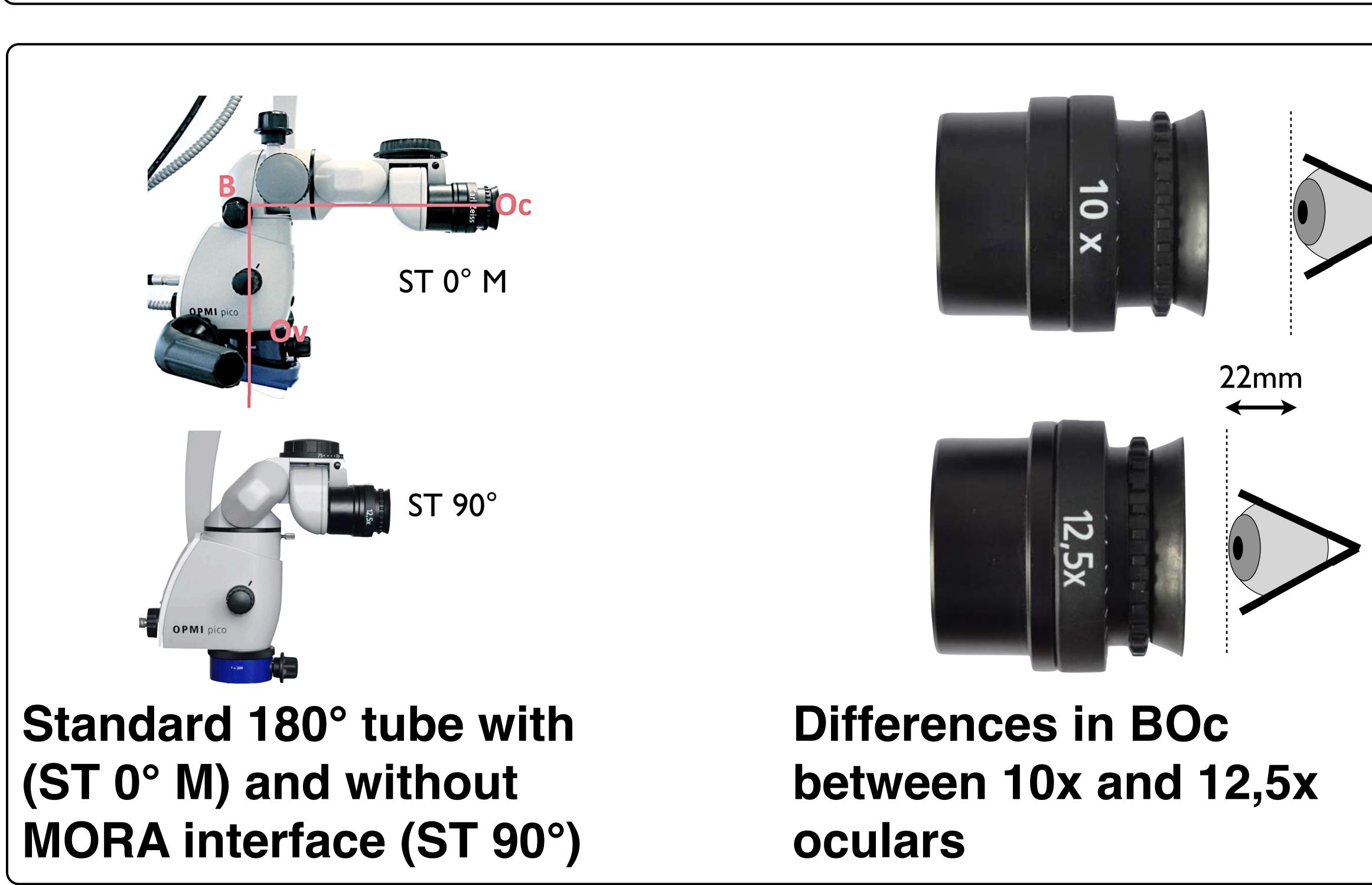


Transfered home position into clinical situation





configurations



Different possible variations with Foldable Tube, MORA-

interface and different focal lengths