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现代应用光学

渐进多焦点眼镜片的个性化设计

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摘要: 介绍了渐进多焦点眼镜片的渐变通道和视近区位置的个性化设计方法。推导出与眼镜片佩戴者瞳距, 镜片到眼球旋转中心的距离, 镜片球光度分布以及镜片的棱镜效应相关的镜片矢高偏移公式, 并将该公式引入渐进多焦点眼镜片设计中。在给定的设计实例中, 镜片视远区中心点偏移了0.5 mm, 视近区中心点偏移了3 mm。与对称设计相比, 偏移后视远区和阅读区的屈光度变化在 $0.03 \text{ m}^{-1}$ 以内。视远区散光度分布没有因为镜片通道和视近区的位置偏移而改变, 保持了视远区屈光度和散光度分布的对称性。该个性化设计方法使老视眼患者在视近物时, 视线自然地通过渐进多焦点眼镜片的渐变通道或视近区, 且该处的屈光度也与视物所需屈光度相符, 提高了渐进多焦点眼镜片佩戴者的佩戴舒适度和适应这种镜片的能力。

关键词: 个性化眼镜片 渐进多焦点透镜 屈光度 散光度

Design of personalized progressive addition lenses

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Abstract: A design method of personalized progressive addition lenses is illustrated. The formula for determining the insets of progressive addition lenses is proposed based on the condition data of a lens-wearer and the prism effects of lenses. The condition data include the dioptric power of progressive lenses on a meridian line, the pupillary distance between both eyes for distance vision and the distance from the rotation centre of eyeball to the lens. The formula is induced to the design of the progressive addition lenses, and a design example is given. It shows that the insets of the center of the distance-vision zone and the near-vision zone are 0.5 mm and 3 mm, respectively. Compared with the symmetry design, the change of dioptric power is within  $0.03 \text{ m}^{-1}$  for the distance-vision zone and the near-vision zone. The symmetry of the dioptric power and the astigmatism of the progressive addition lens are retained on the distance-vision zone. The personalized design provides a pair of progressive addition lenses for lens-wearers through an adequate clear view for both eyes that can be obtained for various distance visions.

Keywords: personalized lens progressive addition lens dioptric power astigmatism

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