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Prediction of Changes in Optical Quality by Tissue Redness after Pterygium Surgery

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Abstract : Purpose: The purpose of this study is to predict optical quality changes after pterygium surgery using tissue redness grading. Methods: Sixty-eight primary pterygium participants were selected from patients who visited an ophthalmology clinic. We developed a semi-automated computer program to measure the pterygium fibrovascular redness from digital pterygium images. The outcome of this software is a continuous scale grading of 1 (minimum redness) to 3 (maximum redness). The region of interest (ROI) was selected manually using the software. Reliability was determined by repeat grading of all 68 images and its association with contrast sensitivity function (CSF) and visual acuity (VA) was examined. Results: The mean and standard deviation of redness of the pterygium fibrovascular images was 1.88 ± 0.55. Intra- and inter-grader reliability estimates were high with intraclass correlation ranging from 0.97 to 0.98. The new grading was positively associated with CSF ($p<0.01$) and VA ($p<0.01$). The redness grading was able to predict 25% and 23% of the variance in the CSF and the VA respectively. Conclusions: The new grading of pterygium fibrovascular redness can be reliably measured from digital images and show a good correlation with CSF and VA. The redness grading can be used in addition to the existing pterygium grading.

Keywords : contrast sensitivity, pterygium, redness, visual acuity
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