

Publication

The price for reduced light toxicity: Do endoilluminator spectral filters decrease color contrast during Brilliant Blue G-assisted chromovitrectomy?

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Vitreoretinal surgeons have been slow to adopt the use of spectral filters for endoillumination to reduce retinal light toxicity. This study shows that spectral filters can be used without a loss in color contrast during brilliant blue G chromovitrectomy. To evaluate the influence of intra operative spectral light filters on perceivable contrast during Brilliant Blue G chromovitrectomy, a prospective, observational clinical study was carried out on 59 consecutive Brilliant Blue G chromovitrectomy interventions in 59 patients admitted for macular holes, macular pucker or vitreomacular traction syndromes. Subsequent to peeling of the internal limiting membrane, six different illumination modes were enabled consecutively: mercury vapor, mercury vapor/xenon, and xenon followed by xenon combined with an amber, green or yellow spectral filter. Main outcome measure was the chromaticity spread between stained internal limiting membrane and unstained retina as a measure for the color contrast perceived by the human eye. Mean chromaticity scores were similar for all light sources: mercury vapor 7.97, mercury vapor/xenon 7.96 ($p=0.96$), and xenon 7.41 ($p=0.55$). Compared to xenon, the additional use of endoillumination spectral filters did not change contrast recognizability: Chromaticity scores were 9.38 for the amber filter ($p=0.13$), 6.63 for the green and 7.02 for the yellow filter ($p=0.37$ and 0.64 , respectively). When comparing the different filters head-to-head, the amber filter was superior to the green filter ($p=0.03$), while the yellow was intermediate and not significantly different from either the amber ($p=0.08$) or the green filter ($p=0.51$). Color contrast perceptibility during Brilliant Blue G assisted chromovitrectomy is similar with mercury vapor, mercury vapor/xenon or xenon light sources. Spectral filters do not decrease color contrast recognizability. Head-to-head comparison shows a significant advantage for the amber over the green filter with respect to contrast generation, the yellow filter is intermediate. As spectral filters are known to greatly reduce retinal light toxicity, we suggest donor eye studies to validate whether the amber filter should be generally recommended for Brilliant Blue G chromovitrectomy.

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