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Effect of Hypersonic and Guillotine Vitrector Devices on Rheological Behavior on Vitreous Liquor. SHIMA A. SARABI, AYSAN RANGCHIAN, HELIA HOSSEINI, PIROUZ KAVEHPOUR, University of California, Los Angeles — Variations in the rheological behavior of the vitreous can occur due to procedures including vitrectomy, extraction of vitreous. Also, vitrectomy trigger the degradation or aggregation of its protein content. The aim of this study was comparing the viscoelastic properties of porcine vitreous between different vitrectomy techniques. We evaluated the results obtained from extensional rheological studies of vitreous samples and compared with shear rheological results. Specimens were collected utilizing two different guillotine vitrectomy cutters (23 and 25-gauge), and hypersonic vitrectomy using the Bausch System. Shear rheological analysis showed that the viscosity of the chopped porcine vitreous was higher using guillotine vitrectomy devices than hypersonic vitrectomy cutter, maybe caused by shortening of protein chains related to guillotine vitrector. Conducting extensional rheological studies showed the highest relaxation time using the 23-gauge hypersonic device might be due to lowest destruction of vitreous segments. The hydrodynamic interaction of the coils investigated with Zimm model, showed that hypersonic vitrector has lower influence on the vitreous structure that causes the vitreous liquid to last longer in the viscoelastic regime.

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