**Intraoperative Pressure Levels for Creating Blebs During Subretinal Delivery of Ocular Gene Therapy**

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**Purpose:**
To characterize the intraoperative pressure levels for creating retinal blebs during subretinal delivery of ocular gene therapy.

**Methods:**
The procedure records of 112 ocular gene therapy patients across nine conditions treated at Casey Eye Institute were reviewed. Fifty-six patients were treated using pneumatic-assisted subretinal delivery with foot-pedal control using the Alcon Constellation vitrectomy system. Use of a balanced salt solution (BSS) pre-bleb prior to gene therapy delivery was performed at the surgeon’s discretion. The recorded BSS pre-bleb maximum pressure and the bleb propagation minimum and maximum pressures in pounds per square inch (PSI) were reviewed. Patient demographics and surgical methodology data were analyzed in a masked fashion. The relationship between injection pressures and patient age was analyzed using linear regression.

**Results:**
The median age of the patients was 36.5 years (range 4-86). The average BSS pre-bleb max to initiate a retinal bleb was 9.5 PSI (range 4-20); the range of average BSS pre-bleb max across retinal conditions was 8.8-10.1 PSI. The average minimum pressure to propagate a retinal bleb was 4.4 PSI (range 2-10); the average minimum pressure to propagate a retinal bleb across retinal conditions was 3.7-5.3 PSI. The average maximum pressure to propagate a retinal bleb was 7.7 PSI (range 4-16); the average maximum pressure to propagate a retinal bleb across retinal conditions was 6.6-9.6 PSI. Patient age was inversely related to the maximum pressure required for bleb propagation (p=0.025; Figure). Patients <21 years required a maximum pressure of 10.0±1.2 PSI (range 6-16), whereas patients >54 years required a maximum pressure of 5.9±0.4 PSI (range 4-8) (p=0.0064; Figure). Comparisons of intraoperative and post-operative OCT videos across disease states remain ongoing as the clinical trials continue.

**Conclusions:**
Our series characterizes the intraoperative pressure levels for creating retinal blebs during sub-retinal delivery of ocular gene therapy. On average, there was slight variation in the intraoperative pressure levels required to initiate a retinal bleb across conditions. There appeared to be greater variation in maximum intraoperative pressure levels for bleb propagation with higher pressures required for younger patients. These results will allow us to further refine our surgical technique for subretinal delivery of ocular gene therapy.