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Presentation Abstract

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Abstract Title:	**Surface Area Coverage of Suprachoroidal Injections Using A Hollow Microneedle in Fresh Human Globes**
Presentation Start/End Time:	Tuesday, May 03, 2011, 1:45 PM - 3:30 PM
Session Number:	352
Session Title:	Drug Delivery /
Location:	Hall B/C
Reviewing Code:	185 drug delivery: iris-ciliary body/intraocular fluids/posterior segment - PH
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Keywords:	685 retina; 452 choroid; 705 sclera
Abstract Body:	**Purpose:** The suprachoroidal space (SCS) is a virtual space between the sclera and choroid tissues and has been shown to accommodate a variety of fluids and particles in rabbit and porcine eyes. Drugs delivered in this potential space can be used for the treatment of posterior segment diseases such as age-related macular degeneration. However, there have been limited studies on the distribution of injected material in the SCS of human eyes. This study examines the feasibility of administering liquid latex within the SCS using a hollow microneedle and the distribution of the latex in the SCS following injection into human globes. **Methods:** Hollow metal microneedles 800-900 µm in length were

fabricated. Latex was used for injection and diluted with balanced salt solution. Human globes (n=20) were obtained from the Lions Eye Institute within 4-8 hrs postmortem. A microneedle was inserted 8 mm posterior to the limbus of a human globe with simulated intraocular pressure of 15 mm Hg and latex was injected. The globe was snap frozen, dissected and imaged to visualize the spread of the latex within the SCS.

Results: Injection of 50, 100 and 150 µL of latex resulted in a coverage of 251+/-51, 432+/-105 and 439 +/-6 mm^2 area of the posterior segment, respectively. These areas correspond to coverage of 17, 39, and 40 % of the posterior segment surface area. The maximum distance the latex spread towards the back of the eye as measured from the limbus was 14.6, 17.4, and 15.3 mm for 50, 100 and 150 µL, respectively. Similarly the maximum distance spread parallel to the limbus was 14.6, 19.7, and 24.2 mm. Reducing the viscosity of the latex from 9.5 to 8.5 cP resulted in the area covered by 50 µL to increase from 257 to 324 mm^2. Allowing an extra 30 minutes between injection and freezing of the eye also caused the area covered by 50 µL of latex to increase from 257 to 342 mm^2.

Conclusions: A single hollow microneedle was able to reliably inject up to 150 µL of latex within the SCS of human eyes from an injection site that would be accessible on a patient. Increase in volume resulted in an increase in the area covered but there was negligible increase when going from 100 to 150 µL. This study also showed that viscosity plays an important role in the spread of latex within the SCS and that injected material has the ability to spread further within the space after it is injected.

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