Abstract

Boston Scientific Neurosurgery division is a leading developer of Catheter technology. In order to train doctors on these new products an Endovascular flow-model was created. Our task was to improve three aspects within the flow-model: The tube connector, the Gel and the diverting system.

Gel: Various preservative additives were researched. Silicone gels produced by Nusil of different varieties were eventually tested and utilized

Connector: Implementation into the existing box was pursued however exterior mounting seemed a better option. Magnetic connections and slip fit designs were also researched.

Diverter: Mechanical and electromechanical valve systems were researched and tested however a clamp design utilizing a bike brake seemed to be the most viable option

Conclusion and Results

Gel: After evaluating various gels produced by Nusil Gel 8150 was selected. Varying samples of the Nusil gel were tested via durometer to compare to that of the Knox gelatin

Connector: With home made flanged tubing we were able to create an external screw style connection that eliminates the plastic lining and leading edge

Diverter: The clamp design required a tube height of 13 inches in order to counteract the pressure in the tubing. Purchased Bicycle parts offered the most viable option

Purpose and Objectives

Gel: Needed to replace Jello mixture, to last longer and be more transparent

Connector: Needed to remove inner plastic lining and localized stiffness and reduce or eliminate leading edge

Diverter: Need to implement a diverting system for fluoroscopic dye.

Aneurysm Information

Definition: Blood filled dilation of the vessel

Treatments: Catheter fed through groin into vascular system and up to brain vessel coils deployed to restrict blood flow into aneurysm

Acknowledgments

Boston Scientific, Tap Plastics, Frank M. Booth Inc, Nusil, 3D-RPM, Helix Medical, Richard Murphy, Stephen Hanlon, Stephen Laguette

References

[2] Solidworks 3-D Modeling Package