Next Generation Surgical Tool using Three-Dimensional (3-D) Printing for Cerebral Aneurysm Treatment

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This modeling project was based on the use of three dimensional (3-D) printing for the development of a surgical tool to help with the treatment of cerebral aneurysms. Current treatment methods, including endovascular coiling and surgical clipping, all have the significant risk of causing more cerebral damage given the increased likelihood of damaging more cerebral tissue with the tight locations at which these aneurysms tend to develop. By using the innovative technique of 3-D printing to create a tangible model, vascular surgeons will be better able to visualize and understand the geometry with which they are working with for each specific case. This experiment involved using P-20 silicone and Field's metal in a series of steps to create a hollow shell of the aneurysm, thus successfully converting the MRI images from specific patients into realistic life-size models of the aneurysm. Further consulting with surgeons and technicians helped to collect feedback regarding the effectiveness of said models in reducing surgery time and increasing the likelihood of success in the surgery, along with using these models for residential training in the medical field.

Awards Won: