## Handmade model

Aneurysm surgery is considered difficult by young and trainee neurosurgeons. This is due to difficulty in understanding the orientation of the aneurysm complex (proximal and distal vessels, aneurysm neck, and fundus) about the surrounding structures (skull, brain, vessels, and nerves) after the head is rotated, extended, and fixed on the head frame. Virtual three-dimensional (3D) imaging studies and 3D-printed models help young neurosurgeons but are not accessible to most of the centers due to the need for resources (humans and equipment). Authors used handmade 3D models of aneurysm complex to train young neurosurgeons before and during surgery to make them understand the steps to treat it.

Methods: RadiAnt DICOM viewer software (2022.1.1, 64-bit, Medixant, Poznan, Poland) was used for acquiring 3D Volume Rendering Technique images to make aneurysm models preoperatively. Twisted 20 Gauze galvanized iron wires were used for making proximal and distal branches and Epoxy Putty (M-seal, Pidilite ® industries, Mumbai, India) was used to make smooth surfaces of the vessels, aneurysm necks, and fundi. Models were used in the operating room (OR) before and during surgery to help surgeons and trainees get oriented to the aneurysm complexes.

Results: Handmade models, oriented as per patients' head position, were useful to make surgeons and trainees to understand the projection of various components of the aneurysm complex about adjacent structures, especially the skull base, during both preoperative planning and in OR even before completion of the dissection.

Conclusion: Handmade models of aneurysms are inexpensive tools and can help trainee neurosurgeons to plan and execute surgical management of aneurysms <sup>1)</sup>.

## 1)

Sharma V, Garg M, Bhaskar S, Tiwari S, Bhatia PK, Jha DK. Handmade models for aneurysm surgery: A useful tool for training. Surg Neurol Int. 2022 Dec 9;13:571. doi: 10.25259/SNI\_941\_2022. PMID: 36600742; PMCID: PMC9805621.

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