Surgeons Use 3D Printing to Create Patient Specific Bone Replacement

Surgeons from the Netherlands have reported on the feasibility of using 3D printed molds for posterior fossa reconstruction as part of Chiari surgery. Currently some surgeons use a titanium mesh to replace the piece of skull that is removed during surgery. This is thought to help prevent dural scarring and reduce the chance of symptom recurrence. In this report, the surgeons developed a surgical planning software tool which used patient specific CT scans to map out the craniectomy (bone removal) and design a mold for the reconstruction. The mold was then created using a 3D printer and filled during surgery with a type of bone cement. The reconstruction piece was attached to the skulls using screws. The surgeons developed and refined the software and mold printing using CT scans from past patients and then used the technique successfully on 3 patients. Post-surgical CT scans showed the accuracy of the reconstruction versus what was planned. The surgeons stress this was only a feasibility study and any benefits of this technique over titanium mesh would have to be evaluated. However, it is exciting to see the surgical community applying the latest technology to Chiari.

SOURCE: *T3D-printed PMMA casting molds for posterior fossa reconstruction in the surgical treatment of Chiari I malformation: technical note and illustrative cases. Pijpker PAJ, Wagemakers M, Kraeima J, Vergeer RA, Kuijlen JMA, Groen RJM. World Neurosurg. 2019 May 28.*