such as traditional angiographic monitors, holograms, virtual or augmented reality models or 3D printed models. Users are able to experience realistic 3D virtual elements with augmented depth perception and binocular field of view. Newer technology has now allowed for interaction with 3D objects within these virtual environments through the use of hand gestures or hand controllers. The authors describe their preliminary experience with MxR as an adjunct tool to traditional angiographic imaging in the preprocedural workup of patients with complex aneurysms using a novel spatial computer, the Magic Leap One device (Magic Leap, Inc Plantation, Florida) which uses a virtual retinal display, which superimposes 3D computer-generated imagery over real world objects, by projecting a digital light field into the user’s eye.

Materials and Methods Tomographic Angiographic (DynaCT) data was imported and segmented to create 3D meshes of the intracranial vasculature. The 3D meshes were then projected into MxR space, allowing the operator to inspect the vasculature using a MxR headset (Magic Leap) as well as interact with the aneurysm and adjacent vessels (handling, rotation, magnification, and sectioning) using hand gestures or hand controllers.

Results 3D segmentation of a complex aneurysms was successfully performed and projected into MxR. Conventional and MxR visualization modes were equally effective in identifying and classifying the pathology. MxR visualization allowed the operators to manipulate the dataset to achieve a greater understanding of the anatomy of the parent vessel, the angioarchitecture of the aneurysm, and the surface contours of all visualized structures.

Conclusion This preliminary study demonstrates the feasibility of utilizing MxR for preprocedural evaluation in patients with anatomically complex neurovascular disorders. This novel visualization approach may serve as a valuable adjunct tool in deciding patient-specific management, including decisions on prognostication and open surgical and endovascular treatment options.

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