Surgical Theater

https://surgicaltheater.com/

In a retrospective institutional experience with illustrative cases Shields LB et al. from the Norton Neuroscience Institute, Louisville published in Epilepsia Open to evaluate the role of the Surgical Theater (ST) 3D visualization system in enhancing presurgical planning for pediatric epilepsy surgery. The ST system enabled integration of multimodal imaging into immersive 3D models, improving collaborative surgical planning, enhancing intraoperative navigation, and allowing VR-based procedural rehearsal. It demonstrated utility across 85 cases and is posited as a promising adjunct for pediatric epilepsy surgical workflows [1)]

Critical Review

This is a descriptive, non-comparative experience report centered on implementing the Surgical Theater (ST) system in a pediatric epilepsy context. While the authors present a visually compelling and potentially transformative workflow for presurgical planning, the study is methodologically weak—it lacks controls, quantifiable outcomes, or statistical rigor. The “results” are largely anecdotal, with 4 case examples insufficiently discussed in terms of surgical impact or clinical outcomes.

The ST system’s theoretical benefits—improved anatomical understanding, interdisciplinary collaboration, and anxiety reduction—are intuitively appealing but require formal validation. There's no comparison to conventional planning or alternate navigation systems. The sample size (n=85) is respectable, but without outcome measures or procedural benchmarks (e.g., seizure freedom rates, operative times, complication rates), the article remains a promotional showcase rather than evidence-based advancement.

Final Verdict

Score: 4/10

Takeaway for the Practicing Neurosurgeon: Surgical Theater provides promising visual tools for complex planning, but current evidence is insufficient to justify its routine use in pediatric epilepsy surgery without further validation.

Bottom Line: Potentially useful, but currently more marketing than medicine.

Blog Categories: Pediatric Neurosurgery, Technological Innovations, Epilepsy Surgery **Tags:** epilepsy, virtual reality, Surgical Theater, augmented reality, pediatric neurosurgery, surgical planning, imaging integration

1)
Shields LBE, Abri H, Karakas C, Davis SD, Mutchnick IS. Novel planning pipeline utilizing the Surgical Theater system for pediatric epilepsy surgery. Epilepsia Open. 2025 Jul 9. doi: 10.1002/epi4.70094. Epub ahead of print. PMID: 40632587.