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Research Abstracts

Improving Family and Child Understanding of the Nuss Procedure Through Virtual Reality

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Introduction: Virtual reality (VR) has become a popular form of gaming, but VR applications in healthcare are still novel. Discussing pectus excavatum and the Nuss procedure with a family can often be difficult for them to visualize in the conventional 2D imaging of CT. We hypothesize that utilizing VR will improve child and family understanding of pectus excavatum and lead to improved informed consent of the Nuss procedure.

Methods: After obtaining IRB approval, children in the chest wall clinic at the OSF Children's Hospital of Illinois were recruited for the study. The study was supported by a grant through the JUMP Arches program. Children provided assent and their legal guardians consented to VR modeling of their chest CT. This was converted into the VR environment utilizing Enduvo software. The Oculus Quest 2 was used in clinic and in the preoperative area as the visualization platform. A pre- and post-test survey utilizing a Likert scale to judge both understanding and engagement compared to standard pre-op discussions was given.

Results: 15 patients participated in the initial pilot study. There was a significant difference in the understanding of the procedure and the chest wall defect after review in virtual reality compared to CT scan (p-value < 0.01). Those same 15 patients were also evaluated on their ability to accurately explain pectus excavatum to those around them and again there was a significant difference after review of the virtual reality (p-value $= 0.02$).

Conclusions: The virtual reality platform increases both engagement and understanding when compared to traditional pre-op discussions. The use of virtual reality in clinic during preoperative discussions can help improve the informed consent process. The Oculus system is portable, can be used in the preoperative area, and does not require additional space or footprint. Further studies are need to show the utility of virtual reality in other surgical disease processes and perioperative planning.