Orthopedic Round Table in Mixed Reality, a Novelty Technology for Case Discussions

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INTRODUCTION:

Augmented or Mixed Reality(MR) is a display technology that combines the real world with the virtual world; it permits digital images or preoperative planning information to be combined with the surgeon's view of the real world.

Mixed is being used principally as a guided device for surgeries like arthroplasties and spine fusion, but the potential usage of the new devices go beyond the OR.

With these glasses is possible to create a virtual table in any room and add virtual avatar characters (representing surgeons) from anywhere to interact in the real world with 3D digital images, exams, video files and pictures for case discussion.

This article will show the first round table discussion occurred using Mixed Reality and describe the steps and devices needed to replicate it.

METHODS:

Using HoloLens 2 MR headset system (Microsoft Corporation, Redmond, Washington, USA), four orthopedic surgeons from Brazil, Switzerland, USA and Ireland connected to a free software called Mesh Meeting (Microsoft Corporation, Redmond, Washington, USA) that allows digital meetings. Each surgeon uploaded pictures of Xray, CT scan, video files and 3D models for 4 different shoulder cases for discussion. The platform allow each surgeon to manipulate any media uploaded with bare hands e place the media file in a virtual room.

Reliability of the connection, usability of the platform and virtual interaction were subjective evaluated.

RESULTS: The internet connection and latency were not an issue during the discussion. All the 3D hologram models uploaded to the platform could be manipulated from any of the 4 surgeons. Pictures, exams and video files could be demonstrated to all participants and the use of the virtual hands increased the perception of a real life discussion when pointing anatomical structures in 3D models and images.

DISCUSSION AND CONCLUSION:

During the global COVID-19 pandemic all orthopedic meetings were cancelled, but the necessity for sharing orthopedic knowledge and continuing education transformed the in-person discussion into digital.

Different meeting platforms like Zoom, Google Meet, and Microsoft Teams were used around the world to allow meetings to occur, but none of these has the ability to use 3D models or social interaction.

Using the free Microsoft Mesh Meeting app for mixed reality glasses Hololens 2 users can create a virtual room with a virtual table and upload any media file, from images, video and 3D Holographic models. Surgeons using the Hololens 2 device can connect into this virtual room and with digital avatars, interact with each other using voice and hand gestures.

The advantages of this new format of round table discussion is allowing any kind of media to the shared, but also the ability to manipulated freely any 3D model with bare hands.

The main disadvantage is the cost of the device that is U$3500, but with new players in this metaverse market, we believe that a new format for digital discussion has emerged and opened a different approach to case discussion