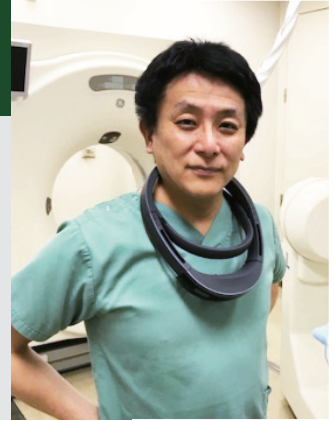


Kansai Medical University Medical Center Dept. of Radiology Paracentesis Training

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How he came to know about Holoeyes

New technologies begin with a concept. Those who believe in its possibilities write research papers about it. Development of the technology then follows. I've been a radiologist for 21 years. While making image diagnoses I've kept up with the steady developments in the field. Early CT machines created a single image for each rotation. Today's machines produce up to 320 images per rotation, making volume rendering possible. I think virtual reality is, in the same way, still in the early stages of development.

In October of 2017 I saw a presentation by Dr. Sugimoto (MD &

Holoeyes COO) at the Society for Aging Image. Prior to that I'd seen the technology on TV, but seeing his presentation confirmed for me that VR was something special. I've seen case studies by the plastic surgeon Dr. Narita (Midori-gaoka Hospital, Spinal Orthopedic Surgery Center), but although I've never heard of or seen anyone in my field of IVR in doing such work in either Japan or North America I wanted to be the first to try it.

Expectations for Holoeyes Service

I'd like to use images of the technique during an actual surgery. Performing a paracentesis requires a special skill. Skin is soft, and because there is no exact point of reference we use CT to show how the needle is inserted for local anesthesia. The position and angle of the needle are determined by the position of the needle relative to the point of reference. A protractor is used when doing this. In a worst case scenario a CT is used to confirm the needle's position during the paracentesis.

However, the exposure to radiation is almost like putting your hand into a nuclear reactor during a meltdown. For this reason, HoloeyesXR service would be ideal for training young physicians in this special skill because it would allow them to confirm the needle's angle under actual conditions.



His Impressions After Using It

We tried training with it using a dummy we made. The response from within the paracentesis treatment community was very positive.

At present, molecularly-targeted therapy is used for treating lung cancer, and CT guidance is needed to perform the biopsy to confirm the type of genes. Paracentesis is required for that examination.

I think VR will soon become a valuable tool for both training and for actual procedures.

Possible Obstacles to Introducing This Technology

At the VR conference held in the U.S. at the end of March, 2018, about five different presentations were given on VR. However, none of them dealt with using it in a clinical setting — all were conceptual models. That's why I feel that Holoeyes is playing a leading role in this area.

In terms of obstacles such as departmental and other research expenses I don't see any money problems. However, if a DICOM viewer were including in the yearly contract, having a fixed cost would make it easier to introduce.

I will say that due to the difficulty in connecting the hospital LAN to the Internet a separate PC is used to upload the STL files, so making it VPN compatible would simplify the process.

