Robotic urology with 3D VR image navigation: A promising tool for residency & fellowship training

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Introduction & Objectives: We evaluated the use and benefits of three dimensional (3D) virtual reality (VR) image navigation during performing robotic radical prostatectomy (RARP), robotic partial nephrectomy (RAPN) and robotic pyeloplasty (RPY).

Materials & Methods: Overall, 10 patients were included; RARP (n=8), RAPN (n=1), RPY (n=1). Preoperatively, 3D reconstruction of the images were engineered using mpMRI, Ga68 PSMA-PET/CT, MR Urography and MR angiography images. Images were transferred to VR headsets and dual-console Da Vinci-xi surgical robot via Tilepro. Surgeons, residents and fellows evaluated 3D VR images before robotic surgeries. Images were used as a guide during performing robotic surgery. Indocyanine green(ICG) and Martini Klinik Neurosafe techniques were also applied.

Results: Mean patient age was 56.5±17.9 years. Mean estimated blood loss was 97±37.1cc. Mean follow-up was 5.9±5.6 months. 3D VR images were found to be useful as a guide in RARP cases particularly in locally advanced diseases showing the extent of the tumors in the prostate, helping the surgeon to define the plane of dissection and neurovascular bundle(NVB) sparing (ERUS-DRUS21 European Urology Open Science 2021;33(Suppl 1):S16).
No peri or postoperative complications were observed.

**Conclusions:** Using 3D reconstructed VR images during performing robotic surgery might be a useful tool particularly for residency and fellowship training in robotic urology. We found that images accurately visualized anatomical details in different operative settings and were a valuable guide for both surgeon and trainee. This approach might facilitate a shortened learning curve and improve the surgical outcomes but needs further clinical experience and validation.