

MP27-11 Current disposable ureteroscopes – performance and limitations in a standardized kidney model

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Introduction & Objective: With increasing fragility of the instruments and rising concerns about sterility of reprocessible scopes, several single use devices for fURS have been introduced. In this study we directly compare currently available disposable digital and fiberoptic flexible ureteroscopes with a contemporary reusable fiberoptic device.

Materials and Methods: LithoVue™, Uscope, Flexor®Vue™ and a standard reusable fiber optic flexible ureteroscope (BOA vision®) were each tested in artificial kidney models. The experimental setup included (a) the visualization of all calices (correct assignment of colored pearls) and (b) the extraction of human calculi from all calices with a common disposable extraction device (NGage®). All procedures were performed by 6 experienced surgeons. We recorded successful visualization of calices, stone extraction and times to completion. In addition, the surgeons' workload and performance was determined using the NASA-Task Load Index (NASA-TLX). We referred to a Lickert scale to assess maneuverability, handling, and image quality.

Results: Performances of LithoVue and Uscope in respect to visualization and correct identification of calyces were nearly identical to BOA vision (100%, 97% and 100%, respectively). Times to completion were significantly longer using Uscope ($p=0.003$) and FlexorVue (p). For stone retraction LithoVue performed nearly equal to the reusable scope (97% vs 95% stone clearance), while accessibility especially to the lower poles was impeded using Uscope as reflected by the retrieval time per stone (73s vs. 102s per stone). Image quality was rated best for LithoVue among all devices. Handling and maneuverability within the kidney however were significantly lower among the disposable devices. Workload assessment showed no significant increase when using LithoVue ($p=0.36$), while a significant increase in workload was measured when using Uscope ($p<0.001$). Overall performance of FlexorVue was significantly lower in all parameters

Conclusions: In comparison to currently available disposable ureteroscopes, LithoVue offers overall comparable performance and characteristics to a common reusable device with superior image quality when compared to a common fiber optic scope. Uscope exhibits potential for upper urinary tract stone management but requires further technical improvements. Performance of FlexorVue currently does not offer satisfactory results for routine clinical use.