P034 Operator-assisted vs self-achieved basketing during ureteroscopy: Results from an in-vitro preference study

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Introduction & Objectives: Basketing is one of the fundamental yet most challenging step during flexible ureteroscopy. It is traditionally performed by an endourologist and an assistant who manipulates the basket, and requires both dexterity and coordination between the surgeon and the assistant. A recently introduced device (LithoVue Empower™ or LE, Boston Scientifics, USA) allows the surgeon to directly control the basket without the need of an assistant. We aimed to evaluate the impact of this device on stone retrieval time and surgeon's mental/physical demand.

Materials & Methods: We used a portable bench-training model for flexible ureteroscopy, the Key-box (K-Box®, Porgès-Coloplast, France), in order to compare the LE configured with a 1.9F stone-retrieval tipless basket (ZeroTip TM, Boston Scientific, USA) and a traditional assistant-maneuvered 1.9F stone-retrieval tipless basket (ZeroTip TM, Boston Scientific, USA). Six experienced endourologists (>100 ureteroscopies each) and 7 residents in training in urology retrieved a fake stone (5x5x5mm) from 3 different cavities of the K-Box simulating three renal cavities with increasing access complexity (C1 the simplest, C2 the intermediate, and C3 the hardest) first with the traditional basket (Task 1) and then with the LE device (Task 2). A single use ureteroscope (LithoVue™, Boston Scientific, USA) was used in all cases. None of the subjects had ever used before the LE device. We recorded time from ureteroscope insertion until stone retrieval and defined a failure in case time exceeded 300 seconds. All the operators filled in the NASA Task Load Index (TLI) for self-evaluation of their performance. We then compared results from Task 1 and Task 2 in terms retrieval time, failure rates, and NASA TLI scores using non-parametric descriptive statistics.

Results: Overall, stone retrieval times and failure rates were comparable between Task 1 and Task 2 (all $p>0.05$) for all analyzed cavities. NASA TLI scores revealed lower effort ($p=0.001$) and frustration ($p=0.04$) for the Task 2 vs Task 1. When stratifying the analyses according to surgical experience, fully trained urologists performed faster stone retrieval than residents in training for the C1 and C2 cavities (both $p<0.01$) overall, but no difference was found according to the retrieval device used. Residents showed lower efforts ($p=0.005$) and frustration ($p=0.04$) scores at NASA TLI when performing Task 2, whereas this pattern was not observed in experienced urologists.

Conclusions: The individually controlled retrieval system is an effective device assisting stone retrieval, and does not seem to necessitate specific training even among unexperienced endourologists, who might instead benefit from it in terms of procedure-related anxiety and exertion.