

MP26-03

IN VIVO MICROSCOPIC IMAGING OF BLADDER LESIONS

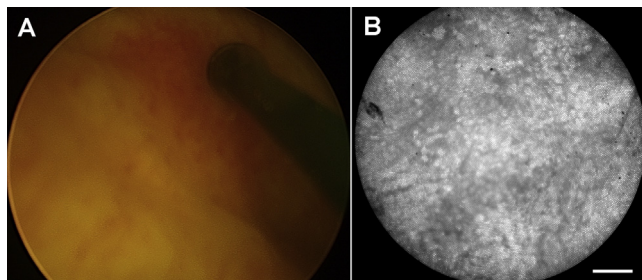
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INTRODUCTION AND OBJECTIVES: The early detection of bladder cancer can lead to early intervention, which in turn can be crucial to a patient's chance for successful treatment. However, there is an important need to improve the ability of cystoscopy to characterize bladder lesions as benign or malignant with high specificity intraoperatively to potentially reduce unnecessary biopsies. The high-resolution microendoscope (HRME) is a low-cost (<\$3000) *in vivo* microscope that provides images with subcellular resolution in real time. The objective of this study is to investigate the utility of the HRME to help characterize bladder lesions and aid in intraoperative decision-making regarding biopsies.

METHODS: Patients scheduled for standard of care cystoscopy at Lyndon B. Johnson Hospital in Houston, Texas were invited to participate in this IRB-approved study. *In vivo* HRME imaging was performed during cystoscopy with the fluorescent contrast agent proflavine (0.01% solution) instilled intravesically, which is used to help visualize cell structure better. The microscopic appearance of bladder sites was compared to clinical appearance and to histopathology if available.

RESULTS: To date 12 patients have been imaged, with pathology diagnoses including papillary cystitis; cystitis cystica; papillary urothelial proliferation; urothelial carcinoma in situ; and papillary urothelial neoplasm. Cell nuclei and vascular patterns are typically observed in the HRME images (**Fig. 1**), with tumor sites displaying larger, more crowded, and more erratically shaped cell nuclei.

CONCLUSIONS: This study demonstrates the use of a low-cost imaging system to image the human bladder *in vivo* with subcellular resolution. The ability to image microscopic features of bladder lesions in real time may have the potential to assist in early detection of bladder cancer and reduce unnecessary biopsies.



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MP26-04

WEARABLE FITNESS TRACKERS FOR MEASUREMENT OF BEHAVIORAL PATTERNS AMONG PATIENTS UNDERGOING RADICAL CYSTECTOMY: A PILOT STUDY ASSESSING FEASIBILITY AND UTILITY

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INTRODUCTION AND OBJECTIVES: Radical cystectomy (RC) is a complicated procedure associated with significant morbidity and lengthy recovery. Wearable fitness trackers (WFT) offer a novel means of objectively evaluating and quantifying patient behavioral patterns. We sought to determine capacity for use of these devices to measure patient sleep and activity levels in the perioperative setting.

METHODS: Under IRB approval, commercially available WFT devices were obtained. Patients undergoing open or robotic RC were prospectively identified. Consenting patients were given a WFT and instructed to wear continuously up to 2 weeks preoperatively, in the immediate postoperative period, and up to 2 weeks after discharge until first follow-up visit. Activity was automatically recorded and measured including total daily steps, calories burned, and sedentary hours. Sleep outcomes included total daily hours asleep and number of awakenings while sleeping. Day of first bowel movement postoperatively was also recorded.

RESULTS: 21 patients were given a WFT for a median of 15 days total (IQR 10-21). Median age was 69 years old (IQR 69-80). Results of captured data are shown in Table 1. Compared to preoperative daily steps, patients reached 11.2% of their baseline on the day prior to discharge and patients averaged 17.6% of preoperative baseline after discharge. When stratifying by those 80 years and older, younger patients had significantly more daily inpatient steps ($p=0.036$) and postoperative daily calories burned ($p=0.028$), as well as greater total steps on day prior to discharge ($p=0.079$). Decreased daily inpatient steps were associated with delayed return of bowel function (9% of patients above average daily inpatient steps delayed vs 50% of patients below average delayed, $p=0.038$).

CONCLUSIONS: Use of WFT to objectively measure patients' activity, sleep, and other physiologic variables is feasible. Patients younger than 80 years old show increased activity levels in the postoperative setting. Ongoing prospective evaluation will provide further insights into patient functional status with implications for risk stratification, discharge planning, and perioperative management among patients undergoing radical cystectomy.

Table 1. Daily means of activity and sleep variables.

Variable	Preoperative	Inpatient	Postoperative
Steps	4,806 (SD: 2,647)	898 (SD: 1,792)	1,517 (SD: 2,043)
Calories burned	2,327 (SD: 1,166)	2,129 (SD: 1,193)	1,776 (SD: 686)
Sedentary hours	14.78 (SD: 4.45)	12.63 (SD: 5.19)	17.84 (SD: 4.19)
Hours asleep	5.26 (SD: 1.77)	6.99 (SD: 3.24)	4.90 (SD: 2.90)
Awakenings per hour asleep	2.27 (SD: 1.39)	0.86 (SD: 0.67)	1.46 (SD: 1.28)

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MP26-05

COMPARISON OF ISCHEMIC INTERMITTENT AND CONTINUOUS INFLOW OCCLUSION DURING LAPAROSCOPIC PARTIAL NEPHRECTOMY IN THE PORCINE MODEL

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INTRODUCTION AND OBJECTIVES: The duration of renal ischemia is the largest modifiable risk factor during partial nephrectomy warm ischemia is associated with short-and long-term renal consequences. A primary goal of partial nephrectomy is to preserve as much renal function as possible. The objective of this study was to explore whether intermittent ischemia could reduce renal function injury during partial nephrectomy in the Porcine Model and explore the feasibility of application of intermittent ischemia in nephrectomy.

METHODS: 6 female pigs underwent Laparoscopic surgery, continuous ischemia was applied to one kidney, and intermittent ischemia to the other kidney in each pig. Each kidney underwent to laparoscopic renal artery occlusion for 120 min. Intermittent ischemia was applied in cycles of 15 min of ischemia and 3 min of reperfusion (15/3 min cycle). Renal function injuries were assessed by microdialysis technique, immunohistochemistry and histopathological examination.

RESULTS: The glycerol concentration of the intermittent ischemia kidneys during ischemia was significantly less relative to the glycerol levels obtained from the kidneys subjected to continuous ischemia ($F=19.06$, $p=0.001$), both the renal tubular epithelial cell NGAL and BCL-2 immunostaining of the intermittent ischemia kidneys during ischemia was significantly low compared with the continuous