

PIV-03 NEPHRON SPARING TECHNIQUES INDEPENDENTLY REDUCE THE RISK OF CARDIOVASCULAR EVENTS AFTER SURGERY IN PATIENTS WITH CLINICAL T1A-T1B RENAL MASS AND NORMAL PREOPERATIVE GLOMERULAR FILTRATION RATES: RESULTS FROM A LARGE MULTI-INSTITUTIONAL STUDY

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INTRODUCTION AND OBJECTIVES: Some reports suggested that nephron sparing surgery (NSS) may protect against cardiovascular events (CE) when compared with radical nephrectomy (RN) in patients with small renal masses. However, the majority of those studies could not adjust their results for potential selection bias secondary to clinical baseline cardiovascular risk of the patients. In the current study, we aimed to test the effect of treatment type (NSS vs. RN) on prevalence of CE after accounting for clinical characteristics, comorbidities and individual cardiovascular risk.

METHODS: A multi-institutional collaboration among four European Tertiary Care Centers allowed collecting 1331 patients with a clinical T1a-T1b NO M0 renal mass and complete cardiovascular event follow-up data. Patients underwent RN (n=462, 34.7%) or NSS (n=869, 65.3%) and showed normal estimated glomerular filtration rates (eGFR) before surgery (defined as pre-operative eGFR \geq 60 ml/min/1.73 m²). CE was defined as the onset of coronary artery disease, hypertensive heart disease, heart failure, cardiac dysrhythmias or cerebrovascular disease. Cox regression analyses predicting CE were performed. To adjust for inherent baseline differences among patients, we relied on multivariable analyses adjusting for age, clinical tumor size, gender, presence of hypertension or diabetes, baseline Charlson comorbidity index (CCI) and smoker status.

RESULTS: Mean patient age resulted 60.6 years (median 62). Overall, 14.7% and 11% of the patients had uncontrolled hypertension or diabetes, respectively. CCI resulted 0-1 in 70.8% of the patients. At a mean follow up period of 71 months, 197 patients (14.8%) developed a CE. When stratifying for treatment type, 10.5 vs. 22.9% patients developed CE (p<0.001). At multivariable analyses, patients who underwent PN showed significantly lower risk to harbour CE compared with their RN-treated counterparts (odds ratio [OR]: 0.50; 95% confidence interval, 0.26-0.96; p=0.03). Presence of uncontrolled hypertension (HR: 3.97, p=0.01) and smoker status (OR: 1.96, p=0.05) resulted independent predictors of CE.

CONCLUSIONS: The risk of cardiovascular event after renal surgery is not negligible. Patients treated with NSS have half of the risk to develop CE relative to RN counterparts. Also after accounting for clinical characteristics, comorbidities and cardiovascular risk at diagnosis, NSS independently decrease the risk of CE relative to RN.

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PIV-04 CONNECT™ – A PILOT STUDY FOR THE REMOTE PROCTORING OF ROBOTIC SURGERY

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INTRODUCTION AND OBJECTIVES: Connect™ is a novel software accessory that adds remote proctoring ability to the da Vinci robot. The interface allows proctors to provide real-time surgical advice to training surgeons via a live bi-directional audio-visual feed with telestration feature. The purpose of this study was to perform a feasibility study of this interface with traditional in-room proctoring as a control.

METHODS: Each training surgeon was randomized to in-room or remote proctoring prior to each case. Inclusion criteria: 1) Selected parts of robotic prostatectomy or partial nephrectomy & 2) Available training, supervising and proctoring surgeons. Exclusion was per attending surgeon discretion. Peri-operative objective data and post-case subjective questionnaire data was collected. Trainee performance was assessed with the validated GEARS (Global Evaluative Assessment of Robotic Skills) assessment tool. Statistical comparison was made by Kruskal-Wallis and paired t-tests.

RESULTS: In the 3-week pilot period, 20 of 32 potential cases were enrolled (62.5%). Operating time for remotely proctored prostatectomy (n=9) was significantly shorter than in-room (n=8) (p=0.02), while EBL was the same (p>0.05). Operating time and EBL was the same for remote (n=3) and in-room (n=1) partial nephrectomies (p>0.05). There was no difference detected between in-room and remote proctor GEARS scores. Proctor and trainee feedback was similar between in-room and remote experiences, except trainees felt remote proctoring enhanced their "confidence as a surgeon" over in-room proctoring (p=0.006) and proctors felt the remote interface was easier to use compared to the in-room mentoring interface (vision cart) (p=0.002). Both proctors and trainees positively rated all aspects of the remote proctoring experience (mean scores 4-5 of 5). There was one complication (bowel serosal injury) during in-room proctoring and one instance in which the remote video feed froze requiring re-connection.

CONCLUSIONS: In this pilot study we showed that robotic surgery trainees can be effectively and safely proctored in a remote fashion. While definitive conclusions cannot be drawn due to limited sample size, the Connect™ interface was reviewed favorably compared to in-room mentoring. We will continue to study Connect™ and its potential for inter-institutional application.

Comparison of IN-ROOM to REMOTE proctoring						
Setup + Connection Data	In-room		Remote		p value	
			Wired	Wireless		
Remote Proctor setup time (min)			4	4.9	0.4	
Connection ping time (ms)			13	31	0.6	
Objective Case Data	In-room		Remote		p value	
			Median (range)			
Prostatectomy (Drop bladder + Endopelvic fascia)	n=8		n=9			
Estimated duration (min)	33.5 (25-45)		20 (14-30)		0.02	
Estimated EBL (ml)	0.5 (0-20)		5 (0-20)		0.6	
Partial Nephrectomy (Drop colon + lift ureter)	n=1		n=3			
Estimated duration (min)	60		29 (22-35)		0.2	
Estimated EBL (ml)	0		5 (0-10)		0.3	
Subjective Case Data	In-room		Remote		p value	
			Median (range) – max 30			
GEARS robotic skills rating						
Trainee self-rating	20 (17-28)		17 (16-22)		0.2	
Proctor rating of trainee	24 (18-27)		23 (20-25)		0.5	
Post-case questionnaire - Trainee			Median (range) – max 5		p value	
	Proctoring helped me recognize anatomic structures	4 (1-5)		5 (4-5)		0.4
	Proctoring helped me improve my surgical skills	4 (2-5)		5 (4-5)		0.1
	Proctoring improved my confidence as a surgeon	4 (3-5)		5 (5-5)		0.006
	Proctoring allowed for safe completion of the task	5 (2-5)		5 (4-5)		0.06
	Proctoring experience worked well	5 (4-5)		5 (3-5)		0.6
	Proctoring interface was easy to use	5 (3-5)		5 (3-5)		0.5
Telestration feature was helpful	5 (5-5)		5 (4-5)	0.6		
Post-case questionnaire - Proctor			Median (range) – max 5		p value	
	Proctoring helped me delineate anatomic structures	4 (2-5)		4 (3-5)		0.9
	Proctoring helped the trainee improve surgical skills	4 (3-5)		4 (3-5)		0.3
	I was confident in my ability to proctor	5 (4-5)		4 (4-5)		0.4
	Proctoring allowed for safe completion of the task	4 (4-5)		4 (4-5)		0.4
	Proctoring experience worked well	4 (3-5)		4 (3-5)		0.2
	Proctoring interface was easy to use	3 (3-4)		4 (4-5)		0.002
Telestration feature was helpful	3.5 (2-4)		4 (3-5)	0.2		

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