Endourology Society Summer Scholarship 2023

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Understanding Decisions Among Kidney Donors for Minimally Invasive Donor Nephrectomy

Introduction:

The transition to minimally invasive donor nephrectomies (MIDN), which include laparoscopic and robotic assisted approaches, has increased kidney donation rates in recent years by easing the burden of donation for living donors[1-3]. Nevertheless, kidney shortage remains an ongoing issue in the United States[4]. Current literature has shown that acceptance of organ donation is directly linked to an understanding of the donation process[5]. Thus, proper education regarding MIDN may allow for increased consent rates by alleviating concerns held by potential donors.

Identifying factors that impacted decision-making for MIDN among past donors can assist physicians in properly educating potential donors, who likely share similar concerns. In addition, proper education is crucial to ensure fully informed consent before donation. While these factors have been assessed in donors from multiple countries[6,7], no study has been conducted for US kidney donors in recent years. Furthermore, very few studies have evaluated whether patient's post-donation experiences vary with respect to surgical approach and time since donation. Understanding these differences will allow physicians to adapt conversations with future donors to provide better education during the decision to donate.

Our study identified important pre-donation factors that impacted patients' decision to donate as well as their post-donation experiences following MIDN. We also investigated whether post-donation experiences differed based on surgical approach and time since donation. Identifying these differences will allow physicians to provide more effective follow-up care that better addresses donors' medical and psychological needs.

Methods:

We surveyed patients who underwent MIDN (i.e. laparoscopic and robotic assisted) from on experienced, minimally invasive surgery (MIS) trained surgeon at our institution from 2013 to 2023. Patients who were non-English speaking, did not have valid email address, or are decreased were excluded from this study. Patient who met the inclusion criteria were provided a link via email to a REDCap survey.

Regarding pre-donation factors, patients were asked to rate the importance of each factor on a scale of 0 (no importance) to 5 (extreme importance) during their donation decision-making process. Pre-donation factors included: post-operative pain, surgical complications, recovery time, number/size of surgical scars, long-term renal function, improving relationship with recipient, and satisfaction derived from donation. Average importance values were compared

between pre-donation factors to determine which factors were most important when deciding to donate.

Regarding post-donation experiences, patients were asked to respond to a series of "Yes/No" questions about their experiences following MIDN (Table 1). In addition, patients were asked to rate whether certain aspects of the donation process were similar or different to their expectations. Lastly, patients were asked to rate their happiness after donation on a scale of 0 (no happiness) to 5 (extreme happiness). Responses were analyzed based on surgical approach (laparoscopic vs. robotic assisted) and time since donation (within 5 years vs. after 5 years) via Chi-square/Fisher's exact test and T-test/ANOVA with a significance set to $p < 0.05$.

Preliminary Results:

We identified 212 potential patients for this study, of which 161 met inclusion criteria. 39 patients (24%) responded to our survey. Among all surveyed donors, long-term renal function and satisfaction derived from donation were rated the most important factors when deciding to donate, with average ratings of 3.44/5 and 3.10/5, respectively. These were followed by recovery time (2.23/5), post-operative complications (2.15/5), improving relationship with recipient (1.44/5) and post-operative pain (1/36/5). Surgical scarring was rated as least important factor among MIDN donors when deciding to donate, with an average rating of 0.79/5. Furthermore, when considering the distribution of scores for each factor, long-term renal function and satisfaction from donation received the greatest proportion of 5/5 scores (35.9% and 28.2%, respectively). Interestingly, improving relationship received the highest percentage of 0/5 scores (58.9%), surpassing surgical scars (56.4%) and post-operative pain (38.4%), despite not being rated as the least important factor (Figure 1).

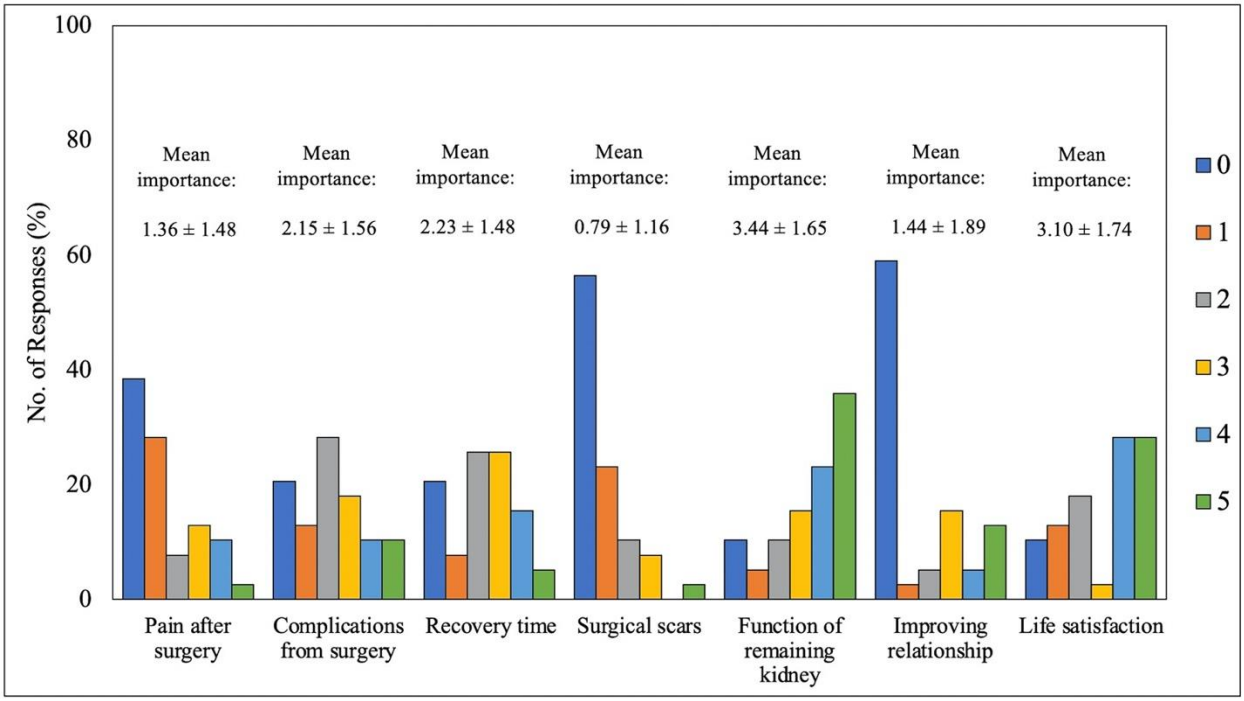

Figure 1. Patient ratings of pre-donation factors on a scale of 0 (no importance) to 5 (extreme importance). Ratings were compared by percent of total responses (N=39). Mean importance was calculated for each factor.

Regarding post-donation experiences, 94.7% of all surveyed donors reported an increased sense of happiness following donation, with an average rating of 4.51/5. Additionally, 87.2% reported no emotional difficulties and 79.5% experienced no adverse impact on quality-of-life, with an additional 10.3% reporting an increased quality of life. 50% of all donors reported that their relationship with the recipient improved after donation. However, 38.5% of donors reported becoming more cautious during activities after donation. Nevertheless, 100% of all surveyed donors reported that they would make the same decision to donate again if they could, based on their current experience. There were no significant differences in responses to post-donation questions and mean happiness after donation with respect to surgical approach (laparoscopic vs. robotic) or time since donation (within 5 years vs. after 5 years).

When asked to compare post-donation experiences with their expectations, 84.6% of donors reported that their post-operative pain was either the same or less than expected, 89.7% reported that recovery time was the same or less than expected, and 92.3% reported that their surgical scars were the same or less than expected. Of note, 33.3% of all donors reported that their surgical scars were less than expected. Again, no significant differences were observed with respect to surgical approach or time since donation (Table 1).

	# OF RESPONDENTS (%)							
		TOTAL (N =39)	ROBOTIC (N=15)	LAPAROSCOPIC (N=24)	P-value	≤ 5 years (N=20)	> 5 years (N=19)	P-value
Pain after surgery					1.000			0.709
	Less than expected	6 (15.4)	2 (13.3)	4 (16.7)		3 (15.0)	3 (15.8)	
	Same as expected	27 (69.3)	11 (73.3)	16 (66.7)		15 (75.0)	12 (63.2)	
	More than expected	6 (15.3)	2 (13.3)	4 (16.7)		2 (15.0)	4 (21.1)	
Recovery time					0.182			0.084
	Less than expected	11 (28.2)	6 (40.0)	5 (20.8)		7 (35.0)	4 (21.1)	
	Same as expected	24 (61.5)	9 (60.0)	15 (62.5)		13 (65.0)	11 (57.9)	
	More than expected	4 (10.3)	0 (0.0)	4 (16.7)		0 (0.0)	4 (21.1)	
Surgical scars					1.000			0.697
	Less than expected	13 (33.3)	5 (33.3)	8 (33.3)		6 (30.0)	7 (36.8)	
	Same as expected	23 (59.0)	9 (67.0)	14 (58.3)		13 (65.0)	10 (52.6)	
	More than expected	3 (7.7)	1 (6.7)	2 (8.3)		1 (5.0)	2 (10.5)	
Quality of life					0.731			0.248
	Decreased	4 (10.3)	1 (6.7)	3 (12.5)		1 (5.0)	3 (15.8)	
	Same	31 (79.5)	13 (86.7)	18 (75.0)		18 (90.0)	13 (68.4)	
	Increased	4 (10.3)	1 (6.7)	3 (12.5)		1 (5.0)	3 (15.8)	
Did donation bring a sense of happiness?					0.129			0.486
	Yes	36 (94.7)	12 (85.7)	24 (100.0)		17 (89.5)	19 (100.0)	
	No	2 (5.3)	2 (14.3)	0 (0.)		2 (10.5)	0 (0.0)	
	Mean Happiness (0-5)	4.51 ± 0.69	4.33 ± 0.75	4.61 ± 0.64	0.277	4.47 ± 0.70	4.56 ± 0.68	0.726
Did you experience any emotional difficulties after donation?					1.000			1.000
	Yes	5 (12.8)	2 (13.3)	3 (12.5)		3 (15.0)	2 (10.5)	
	No	34 (87.2)	13 (86.7)	21 (87.5)		17 (85.0)	17 (89.5)	
Do you take more caution when performing activities?					0.603			1.000
	Yes	15 (38.5)	5 (33.3)	10 (41.7)		8 (40.0)	7 (36.8)	
	No	24 (61.5)	10 (66.7)	14 (58.3)		12 (60.0)	12 (63.2)	
Did your relationship with recipient improve?					0.735			1.000
	Yes	18 (50.0)	7 (46.7)	11 (52.4)		10 (50.0)	8 (50.0)	
	No	18 (50.0)	8 (53.3)	10 (47.6)		10 (50.0)	8 (50.0)	
Would you donate your kidney again?					1.000			1.000
	Yes	39 (100.0)	15 (100.0)	24 (100.0)		20 (100.0)	19 (100.0)	
	No	0 (0.0)	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	

Table 1. Patient responses to post-donation questions. Happiness was rated on a scale of 0 (no happiness) to 5 (extreme happiness). Categorical variables were compared between groups using Chi-square or Fisher's Exact tests. Continuous variables were compared using T-tests or ANOVA.

Preliminary Conclusions:

These data suggest that patients undergoing MIDN prioritize the function of their remaining kidney and satisfaction derived from donation when making the decision to donate, while surgical scars was the least important to their decision-making process. Therefore,

physicians should prioritize discussions on renal function and satisfaction from donation when guiding potential donors through their decision-making process, while allocating less emphasis on surgical scars. Moreover, physicians can attest that donors generally experience increased happiness after donation and are very satisfied with their choice to donate. Regarding follow-up care after donation, donors' experiences do not seem to differ based on time since donation or surgical approach. Consequently, physicians may not need to modify their treatment approach to effectively address the needs of all MIDN patients. Given that donors generally report minimal emotional difficulties and negligible impacts on quality of life, these aspects may not be significant concerns during follow-up care. In addition, experiences with post-operative pain, recovery time and surgical scars generally align with or fall below donors' expectations, suggesting these areas may not warrant prioritization during follow-up. However, a notable portion of donors reported increased caution in activities after donation, which may necessitate attention from physicians during follow-up care to manage and potentially reduce lifestyle restrictions after donation.

Future Directions:

While preliminary data has provided valuable insights into donors' decision-making and post-donation experiences following MIDN, it is crucial to acknowledge the study's limitations. The relatively low response rate (24%) and the modest total sample size (39 patients) highlight the need for additional data to enhance the reliability and robustness of our conclusions. Moreover, we recognize the inherent response bias associated with surveys, and for this reason, we plan to expand our respondent pool. Specifically, we plan to include patients from other physicians at our institution and nearby institutions to help validate our findings by encompassing a more diverse patient population. Furthermore, we plan to collect more responses from patients undergoing single-port robotic assisted donor nephrectomy (SPDN). This will allow for a comprehensive comparison with experiences from other minimally invasive approaches (i.e. laparoscopic and multi-port robotic assisted). In summary, while our initial findings offer valuable insights, we plan to increase data collection and expand our study cohort to enhance the overall robustness and generalizability of our conclusions.

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