

# Same-Day Discharge for Laparoscopic Donor Nephrectomy

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## ABSTRACT

**Introduction:** Laparoscopic donor nephrectomy has provided advantages of decreased postoperative pain and length of stay when compared to the open approach. We provide our results of same-day discharge for laparoscopic donor nephrectomy.

**Case Presentation:** We examined the safety and efficacy of same-day discharge for laparoscopic donor nephrectomy in a retrospective cohort analysis. This institutional review board–approved study began in July 2015, when all consecutive patients who underwent laparoscopic donor nephrectomy were offered same-day discharge. Experimental and control groups were analyzed for differences in sex, age, body mass index, surgery time, estimated blood loss, procedure, complications, length of stay, and distance lived from hospital. Statistical analyses were completed with Mann-Whitney U or Fisher's exact test, as appropriate.

**Management and Outcome:** Eight patients underwent laparoscopic donor nephrectomy during the study period. Of the 8 donors, 4 were discharged on the same day as surgery. The other 4 were discharged the following day. No significant differences were found between the 2 groups with respect to the aforementioned variables. At a median follow-up of 206 days, no complications have been reported.

**Discussion:** The results of our pilot study revealed that same-day discharge is safe and feasible, could have a significant impact on patient satisfaction and healthcare costs, and warrants further study.

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## INTRODUCTION

Laparoscopic donor nephrectomy (LDN) has become the standard practice in the care of living kidney donors.<sup>1</sup> Evidence has shown that LDN has decreased the blood loss, pain, and length of stay for kidney donors when compared to open donor nephrectomy.<sup>2</sup> Also, the faster convalescence of LDN over open donor nephrectomy has led a greater number of patient to be willing to be living kidney donors, as evidenced by the fact that living kidney donation accounted for approximately 32.5% (17,600) of all renal transplants in 2013.<sup>3</sup> Many other specialties have attempted to continue to decrease the length of stay for certain surgical procedures,<sup>4–6</sup> but little has been published in the literature with respect to attempts at serially decreasing the length of stay for LDN patients.<sup>7</sup> Our current report is the result of a pilot study in which we assessed the safety and feasibility of same-day discharge (SDD) after LDN.

## CASE PRESENTATION

An institutional review board–approved retrospective review was performed of a prospectively maintained LDN database. This database is reviewed in real time for quality-improvement initiatives. In reviewing our database, we discovered that there had been no LDN complications within 24 h of surgery. As a result, starting July 2015 and continuing throughout the study period of 6 months, all consecutive patients undergoing LDN were offered SDD. All patients underwent the same preoperative work up, and therefore no patients were excluded from the offer of SDD.

## MANAGEMENT AND OUTCOME

The SDD protocol includes preoperative counseling regarding the safety of SDD during the initial clinic visit, as well as a multimodal approach to pain control, and limitation of intraoperative fluids during the surgery. As part of the protocol, all patients who accepted SDD were

offered a room in the on-campus hotel and were called personally by the surgeon on the night of surgery. Patients who declined SDD were admitted to the hospital according to standard protocol. Perioperative and demographic data were prospectively collected on all patients who underwent LDN. The SDD (group 1) and control (group 2) groups were analyzed for differences in sex, age, body mass index (BMI), laparoscopic surgery time (lap time), estimated blood loss (EBL), procedure, complications, length of stay (LOS), and distance from home to the hospital. We also reviewed the glomerular filtration rate (GFR) at 6-month follow-up for each patient, as calculated by the modification of diet in renal disease (MDRD) equation.<sup>18</sup> Statistical analyses were completed using SPSS v23, with Mann-Whitney U tests used to compare continuous variables, and  $\chi^2$  or Fisher exact tests were used where appropriate to compare categorical variables across protocol groups ( $\alpha = 0.05$ ).

All potential kidney donors undergo an extensive screening process to ensure that they are suitable for LDN. The procedure is performed on either the left or right side, based on the patient's renal anatomy and preference of the recipient surgeon. Patients do not undergo bowel preparation, and the skin is not shaved before the procedure. Patients are placed in the appropriate-sided lateral decubitus position. Before induction to general anesthesia, patients are administered 15 mg intravenous (IV) ketorolac and, before incision, the skin is infiltrated with

local anesthesia (0.5% bupivacaine). A Pfannenstiel incision is made to obtain access to the peritoneum and a 12-mm laparoscopic port is placed through this incision. Additional ports are placed in the abdomen, where appropriate, to allow for dissection and removal of the kidney. After transection of the hilar vessels, the kidney is placed into a bag and extracted through the Pfannenstiel incision. Before the skin incisions are closed, local anesthesia is again administered.

Donors accepting SDD were placed into extended recovery and were monitored in the recovery room for 4–6 hours. Once they were able to void and their pain was well controlled with IV and oral narcotic pain medications, they were discharged with oral narcotic pain medication and instructions on adequate hydration and activity level. The surgeon called patients on the night of discharge and then evaluated them in the clinic on the next postoperative day. The same pre-, intra- and postoperative protocol was used for patients who refused SDD and each of these donors was seen by the surgeon on postoperative days 0 and 1, while in the hospital.

Since initiating our SDD protocol, a total of 8 donors have been offered SDD. Of those, 4 donors accepted (group 1) and 4 refused (group 2) SDD. All group 1 donors were successfully discharged on the day of surgery, and all group 2 donors were successfully discharged on postoperative day 1. Only 1 in the SDD group elected to stay at

**Table 1.**  
Perioperative and Demographic Data

Characteristic	SDD Accepted (n = 4)	SDD Declined (n = 4)	P
Age (years)	27 (20–60)	52 (20–55)	.69
Sex			.99
Female	2	3	
Male	2	1	
BMI (kg/m <sup>2</sup> )	24.15 (21.1–26.6)	27.5 (90.0–155.0)	.34
Distance from hospital to home (miles)	71.95 (17.4–535.0)	38.95 (7.50–121.00)	.486
Side			.99
Right	1	0	
Left	3	4	
Operative time (min)	140.5 (115.0–144.0)	125.0 (90.0–155.0)	.03
LOS (days)	0	1.00 (1.0–2.0)	
EBL (mL)	50	50	.99
GFR at 6 months (mL/min/1.73 m <sup>2</sup> )	70.63 (48.5–94.9)	54.08 (46.1–69.5)	0.09

Unless otherwise stated, data are expressed as the mean (range).

the on-campus hospital and the remaining 3 went home from the recovery unit. Perioperative and demographic data are presented in **Table 1**.

All but one of the donors underwent left LDN. Mean age, BMI, distance from home to the hospital, sex of the donor, EBL, and postoperative GFR were not significantly different between groups 1 and 2. From group 2, the most common reason given for refusing SDD was anxiety about recovering at home. At a median follow-up of 206 days, there have been no complications within either group and there have been no graft failures in either group for the same follow-up period.

## **DISCUSSION**

Historically, open donor nephrectomy was the only option for a willing kidney donor. The anticipated pain and long time to convalescence was seen as a barrier for patients willing to become donors. However, advancements in laparoscopic technology developed and were integrated into the donor nephrectomy. Since the first donor nephrectomy was performed by Ratner et al,<sup>8</sup> there have been multiple published reports indicating that reduced pain, faster return to work, and fewer postoperative visits were just some of the advantages of LDN versus open donor nephrectomy.<sup>1,2,9,10</sup>

These findings are not surprising, given the existing literature in regards to other procedures having undergone a similar shift in treatment paradigm. A meta-analysis by Elfenbein et al<sup>11</sup> concluded that the significant reductions in postoperative complications and length of stay was seen in patients who underwent laparoscopic adrenalectomy in comparison to the traditionally used open surgical technique. The same results were seen in the adoption of laparoscopy for hiatal hernia repair, as reported in a comparative study written by Nguyen et al.<sup>12</sup> Finally, and most closely related to LDN, laparoscopic radical nephrectomy has been shown by Jeon et al<sup>13</sup> and Laird et al<sup>14</sup> to yield lower volumes of blood loss, shorter follow-up periods, and similar surgical and oncologic outcomes, as compared to radical open nephrectomy.

Shifting the paradigm to allow for home recovery for LDN patients could result in an increase in individuals willing to undergo kidney donation. Previously published reports show that decreasing time spent in the hospital and overall recovery time has increased the pool of willing kidney donors.<sup>15,16</sup> In a separate study, Ratner et al<sup>16</sup> concluded that LDN “effectively removes or diminishes some dis-

incentives to live donation”; with those disincentives being length of stay, postoperative pain, recovery time, and time until return to employment. The authors indicate that a 25% increase in the number of willing donors was afforded by offering LDN.<sup>16</sup> These results demonstrate the value of LDN to rates of live kidney donation, through improving patient care and satisfaction, as compared to open donor nephrectomy. By extension, we believe that offering outpatient donor nephrectomy for potential kidney donors may make the procedure more appealing to an even greater proportion of the population.

Of course, ours is a small, pilot study and the generalizability may be limited by our small sample. The patients who did not wish to have SDD cited anxiety as the primary reason. A paper published by Gilmartin<sup>17</sup> indicated that quality of instruction, pain management, and physician follow-up are 3 patient-identified aspects that are necessary to maintain patient satisfaction with SDD for LDN. Gilmartin’s review of patient perspectives of SDD procedures gives insight to what may be the root of patient anxiety pertaining to at-home recovery.<sup>17</sup> Using this information, we believe that any center wishing to offer SDD should create and adopt into practice a detailed protocol for ensuring patient comfort and satisfaction and minimizing anxiety about discharge and recovery for SDD LDN.

Despite the study limitations, we believe our pilot study has shown proof of concept for SDD for LDN. The applicability of this protocol should be studied further with prospective, larger randomized trials.

Our current study showed that LDN is feasible and safe. Shifting the paradigm toward home recovery for LDN patients could be a means of decreasing complications and hospital costs and increasing patient satisfaction and willingness to donate a kidney.

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