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ORIGINAL ARTICLE

Kidney transplantation: A new era of laparoscopic living donor nephrectomy in Indonesia[☆]

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KEYWORDS

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Summary *Background:* Since its introduction in 1995, laparoscopic living donor nephrectomy (LLDN) has been a standard procedure in many transplantation centers worldwide. In 2011, LLDN was performed for the first time in Indonesia and became a standard procedure at our institution. The aim of this study is to evaluate the first 250 cases of LLDN at our institution. *Methods:* Retrospective analyses were conducted of the first 250 cases of LLDN. All operations were performed between November 2011 and July 2015 at Cipto Mangunkusumo Hospital, Jakarta. We grouped each 100 consecutive cases and the last 50 cases (three groups) to evaluate operation-related parameters, and complications.

Results: Significant decreases in the first warm ischemic time, blood loss, length of stay, and number of complications were observed among the three groups. There was only one conversion to open case during LLDN surgery and no mortality case observed.

Conclusion: Laparoscopic living donor nephrectomies had been performed successfully with improvement of surgical parameter in due time. Thus, laparoscopic approach has entered a new era for kidney procurement in Indonesia.

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1. Introduction

End-stage renal disease (ESRD) showed an exponential growth in Indonesia.¹ Kidney transplantation is the treatment of choice of patients with ESRD.² Kidney

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transplantation is more cost-effective and better quality of life than hemodialysis for patients with ESRD.^{3–5} Ratner et al⁶ introduced the first laparoscopic living donor nephrectomy (LLDN) in 1995. Since its introduction, LLDN has become a standard procedure for kidney procurement in the world.^{7,8} In 2011, Mochtar et al⁹ performed the first LLDN in Indonesia. The aim of this study is to review experiences of LLDN at our institution.

2. Methods

Between November 2011 and July 2015, there were 250 consecutive cases of laparoscopic living donor nephrectomies (LLDN). The LLDNs were performed at Cipto Mangunkusumo Hospital, Jakarta, by transperitoneal approach using 4-trocars placement and one Pfannenstiel incision. The position of the donor is modified left or right lateral position. There are one experienced laparoscopic surgeon and two other laparoscopic surgeons who had been trained by mentor-initiated approach. They alternately performed LLDN. Most of our LLDNs used Harmonic scalpel (Ethicon Endo Surgery INC - Johnson & Johnson Medical SPA, Somerville, NJ). Hem-o-lok® (Teleflex Incorporated, Wayne, PA) was used to divide renal vein and artery. Medical records were searched for demographic donor data (age, body mass index, gender, side of kidney donation, donor–recipient relationship), intraoperative data (warm ischemic time I, cold ischemic time, warm ischemic time II, blood loss, conversion to open, length of stay) and post-

operative data. Subjects were categorized into three groups: the first 100 cases, the next 100 cases and the last 50 cases. Warm ischemic time I, operation time, blood loss, length of stay and complications were compared among these three groups. Analysis of variance (ANOVA) test or Kruskal–Wallis test and Chi-square test were used to compare numerical and categorical variables. The Statistical Package for The Social Sciences (SPSS, SPSS Inc.) version 20.0 was used for data analyses, with p-value <0.05 considered a statistically significant.

3. Results

3.1. Donor characteristics

The mean age of the donors was 32.39 years. The donor was mainly male and had no relationship with the recipients. The left kidney accounted for up to 84% cases of LLDNs since it was the preferred side for kidney harvesting, due to its longer renal vein. Donor demographic data is shown in the [Table 1](#).

3.2. Comparison among groups

[Table 2](#) showed the comparison data among three groups. In our study, there were significant differences in warm ischemic time I, blood loss, length of stay, and complications among these groups (p-value <0.05). Our operation time was getting shorter. However, it was not statistically significant.

Table 1 Donors' characteristics (n = 250).[†]: Mean ± standard deviation (SD).

Characteristics		
Age, year(s)		32.39 ± 9.2 [†] (17–60)
Gender, n	Male	168 (67%)
	Female	82 (33%)
Side of donation, n	Right	39 (16%)
	Left	211 (84%)
Donor-recipient relationship, n	Related	49 (20%)
	Unrelated	201 (80%)
Body mass index, kg/m ²		23.74 ± 4.1 [†] (16.1–39.5)

Table 3 Complications.

Complications	n (% of 250)
Intra-operative	
Bleeding >500 ml	8 (3.2%)
Bladder laceration	2 (0.8%)
Post-operative	
Urinary retention	6 (2.4%)
Wound infection	2 (0.8%)
Severe pain in first 24 h (VAS ≥ 7)	1 (0.4%)

Table 2 Comparison of each group of LLDN.[†]: mean ± SD.[‡]: median (range).

Parameters	Total (n = 250)	Group 1 Cases 1–100	Group 2 Cases 101–200	Group 3 Cases 201–250	p-value
Warm ischemic time I, min(s)	4.20 ± 3.50 [†]	6.42 ± 3.63 [†]	2.97 ± 2.98 [†]	2.20 ± 0.70 [†]	0.001
	3.17 (1.22–30.43) [‡]	5.65 (2.32–24) [‡]	2.36 (1.22–30.43) [‡]	2.03 (1.23–4.58) [‡]	
Operation time, min(s)	254.09 ± 44.48 [†]	261.6 ± 48.98 [†]	251.74 ± 40.67 [†]	243.78 ± 40.36 [†]	0.054
	250 (105–420) [‡]	257.5 (165–420) [‡]	250 (105–390) [‡]	235 (123–315) [‡]	
Blood loss, ml	194.36 ± 197.84 [†]	263.3 ± 252.90 [†]	155.3 ± 145.31 [†]	134.6 ± 102.66 [†]	0.001
	150 (20–2000) [‡]	200 (100–2000) [‡]	100 (30–1000) [‡]	100 (20–500) [‡]	
Length of stay, day(s)	3.82 ± 1.26 [†]	4.46 ± 1.36 [†]	3.61 ± 1.12 [†]	2.96 ± 0.2 [†]	0.001
	3 (2–9) [‡]	4 (3–9) [‡]	3 (2–7) [‡]	3 (2–3) [‡]	
Complications, case(s)	19	16 (16%)	3 (3%)	0	0.002

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