



## Platinum Priority – Editorial and Reply from Authors

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# Laparoscopic Living-Donor Nephrectomy: Is It Really Better?

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Strong evidence suggests that living-donor transplantation (LDN) is the optimal treatment for end-stage renal failure [1].

LDN is a unique procedure as it is performed on a healthy individual. As such, this technique must be absolutely safe, with a low mortality rate, and must procure a perfect renal transplant [2]. Several techniques are available besides open LDN (OLDN). Laparoscopic LDN (LLDN), first performed in 1995 [3], was introduced mainly to improve the functional impact of nephrectomy by reducing postoperative course, hospital stay, and time to return to work. The main concerns of LDN, however, must remain donor morbidity/mortality and the transplant quality. It is obvious that an LLDN program requires laparoscopically trained transplant surgeons and has a risky learning curve. More than 15 yr after the first LLDN, there is still debate about the best technique for LDN: the “old safe” OLDN versus the “new light” LLDN. There is a huge amount of literature, meta-analyses, review articles, randomized trials, and comparative studies evaluating these two approaches, but there is no clear evidence to recommend one as a standard. In this issue of *European Urology*, Greco et al nicely tried to clarify the 1997–2010 complex data on surgical approaches of LDN [4].

In the literature, several technical procedures were reported either for OLDN (standard OLDN, mini-OLDN) or for LLDN (pure LDN, hand-assisted LLDN [HALLDN]). Moreover, new laparoscopic techniques with promising results are emerging (eg, single-port LLDN, natural orifice transluminal endoscopic surgery [NOTES], laparoendoscopic single-site [LESS], robotic LLDN), making the results and analysis more and more confusing. It would be correct to compare a new technique to a well-established technique, such as OLDN [5,6]. In 2010, the question is: Must we move from OLDN to LLDN as a standard approach for LDN?

Often, the “new” techniques are not properly compared to OLDN. Most of the articles published in the literature used the standard outcomes of interest, donor operative and postoperative parameters, donor adverse events, and recipient and graft parameters for the evaluation or for the comparison of the techniques. The three major parameters of interest in LDN are high-grade morbidity/mortality of the donor, the quality of the renal transplant (warm ischemia time, delayed graft function, survival), and the financial costs. In-patient analgesia, length of diet, hospital stay, and cosmesis are rather minor criteria. The number of techniques and of these relevant parameters make the interpretation of the results more complex.

Several articles (level of evidence 1–2) comparing OLDN and LLDN have been published recently in the literature, including a nice meta-analysis performed in 2008 by Antcliffe et al. [3]. Using strict selection criteria, these authors selected 9 articles from 150: 3 retrospective studies, 5 prospective studies, and 1 randomized controlled trial. The authors concluded that mini-OLDN (<15-cm skin incision) provided advantages for the donor in comparison with standard OLDN and a shorter warm ischemia time and operative time than standard LLDN [3]. Antcliffe et al, using the three major parameters for the evaluation of LDN, clearly failed to prove any superiority of LLDN over OLDN [3].

In 2008, another well-conducted global meta-analysis by Antcliffe’s group, including 6594 patients and comparing LLDN and OLDN, reported no clear benefit of LLDN over OLDN [7]. When only randomized control trials were considered, there were shorter operative times for the OLDN but nonsignificantly different warm ischemia times. In contrast to the global analysis, there were no differences in the overall complication rate, postoperative analgesia, hospital stay, or time taken to return to work.

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In 2009, Nicholson et al published a randomized clinical trial comparing the safety and efficacy of 28 OLDNs to 56 LLDNs [8]. In this series, there was no mortality and no vascular thrombosis. At a median follow-up of 74 mo, there were no difference in renal function or allograft survival between the groups. Warm ischemia time and operative time were longer in the HALLDN. Donor postoperative pain, respiratory function, and recovery parameters were better in the HALLDN group. One laparoscopic operation was converted to an open procedure owing to intraoperative bleeding from the renal artery stump. The arterial clips were dislodged when an endovascular stapling device was closed around the renal vein but were inadvertently included the arterial stump.

Other recent studies comparing HALLDN to OLDN seem to report results in favor of the HALLDN [9]. These series are still retrospective with small patient populations, and it is too early to recommend HALLDN instead of standard LLDN according to these results [10].

In 2007, Shokeir published a relevant literature review about patient morbidity/mortality comparing OLDN versus LLDN [11]. In 69 selected papers, there were 7 randomized controlled trials and 5 prospective nonrandomized studies. The remaining were retrospective studies and case reports. Shokeir concluded that LLDN has the disadvantages of increased operative time, increased warm ischemia time, and increased major complications requiring reoperation. It was difficult to analyze the results about perioperative mortality and graft loss due to technical reasons because they were reported mainly in old series and not in the recent ones [11]. Moreover, there is probably an underreporting of the unfavorable results of LLDN.

More recently, in a literature review published in 2009 about morbidity/mortality in 1022 consecutive living-donor nephrectomies, Mioen et al reported that increased risk for a combined endpoint of intraoperative incidents, major complications, and significant bleeding were seen in relation to laparoscopic surgery (odds ratio 2.63; 95% confidence interval, 1.33–5.19) [12]. But with time and experience these high-grade complications of LLDN will decrease and probably will become equal to the morbidity of OLDN, according to the most recent published series [13].

Regarding the financial aspect of LDN, LLDN is inherently more expensive than OLDN, especially for the mini-OLDN [3,14]. In a recent study, Hamidi et al compared prospectively the costs of 59 OLDN to the costs of 63 LLDN [14]. The cost per patient was \$55 292 with LLDN and \$29 886 with OLDN. The greatest cost difference was in costs attributed to complications. Hamidi's group concluded that LLDN is cost effective only with relatively low rates of complications, as seen in expert centers [14].

For the cosmetic aspect and the wound healing, there is no strong evidence to support the benefit of LLDN with three or four port incisions, including the kidney extraction incision over the single incision of OLDN [9]. But it is clear that during OLDN efforts must be made to limit the length of

the incision. In fact, with the competition of laparoscopy, the techniques of open surgery have improved.

Whereas for urologists, nephrologists, and caregivers there is strong scientific evidence to favor LDN, the majority of the general population is opposed to or undecided about this idea and approximately only a quarter of the general population is in favor [1,15]. Refinements in LDN, with the use of laparoscopy, could help to reverse this opinion in the public; however, in 2010, there is no strong evidence that LLDN is better than OLDN.

**Conflicts of interest:** The author has nothing to disclose.

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