Laparoscopic harvesting of kidneys for living donor kidney transplantation

H. Kais, A. Szold, H. Merhav, and R. Nakache

Laparoscopic live donor nephrectomy (LDN) is a new technique that provides advantages over open surgery: lower morbidity, faster recovery, shorter hospital stay, more rapid convalescence, and improved appearance. The safety of the procedure, rate of intraoperative complications, and short- as well as long-term function of the transplanted kidney have been evaluated in the literature. The procedure is not yet performed in all transplantation units owing to its technical complexity. We report our experience with LDN.

Materials and Methods

LDN was performed on 21 patients (11 women and 10 men) at our institution from February 1998 to March 2001. Mean donor age was 38.9 years (range: 24 to 61 years). During the same period, 4 patients underwent the open technique due to obesity. Mean donor age was 38.9 years (range: 24 to 61 years). Donors were evaluated using medical history, physical examination, renal function testing, blood group, and cross match. Graft assessment was completed by ultrasound, DMSA scan, computed tomography, or renal angiography.

Broad spectrum antibiotics were administered; no bowel preparation was used. Under general anesthesia, a nasogastric tube and Foley catheter were inserted with the patient positioned in the right decubitus position. The table was placed into mild flexion, and the kidney rest was mildly elevated. The patient was carefully padded, and draped to allow access for a short midline incision permitting extraction of the kidney, as well as a standard left flank incision should conversion to an urgent laparotomy be necessary. Urinary output and intravascular bed filling were monitored closely. Mannitol infusion was administered. Before kidney retrieval, 5000 U of intravenous heparin were given. Following exploration of the peritoneal cavity insulated with carbon dioxide at a pressure of 12 mm Hg, the left colon and spleen were mobilized and retracted medially. The renal vein and artery and the ureter were isolated. The adrenal gland was dissected from the upper pole of the kidney. After freeing the kidney, a 5- to 6-cm periumbilical incision was made, through which a large extraction bag was inserted. Division of the ureter was performed with endoclips, followed by transection of the renal artery and vein using a vascular endostapler. The kidney was then placed on ice and flushed with cold UW solution.

Mean operative time was 178 minutes (range: 120 to 240 minutes) with a mean warm ischemia time of 128 seconds (range: 90 to 200 seconds) with a recent trend toward shorter times. Mean hospital stay was 3.6 days (range: 2 to 6 days). Blood loss was minimal (80 mL). There were no intraoperative complications. Following LDN, 2 patients required blood transfusion, 1 developed an infected lymphocele requiring repeated drainage, and 1 developed a hernia in the midline incision.

The subsequent transplantations were uneventful. In our series, graft function at 7 and 30 days posttransplantation did not appear to be influenced by the laparoscopic technique.

Discussion

LDN requires a high degree of donor surgery and advanced laparoscopic expertise to achieve good results. Worldwide overall results of the technique are improving over time. The viability of this option is dependent on the following: (1) no additional morbidity in LDN when compared with the open procedure; (2) graft survival and renal function equivalent to that obtained by open nephrectomy; and (3) less pain, shorter hospital stay, as well as earlier return to normal activity. Many series have shown the superiority of LDN over open surgery: namely, lower blood loss, less narcotic analgesic use, 50% shorter hospital stay, and more rapid return to normal living.

High-pressure pneumoperitoneum may lead to impaired renal blood flow and transient renal ischemia, resulting in altered renal function. These concerns have lessened since at 1 year the renal function of grafts obtained by LDN is comparable to those yielded by open technique. In the present series, we used a lower pneumoperitoneum pressure, which may explain the lack of deteriorated function in the transplanted kidney at 7 and 30 days’ follow-up.

In conclusion, LDN offers several advantages over the open approach, resulting in less postoperative pain, shorter hospital stay, reduced donor morbidity, and improved appearance. LDN should be an established part of a transplantation program because it may increase the pool of organ donors.

References


From the Transplantation and Advanced Endoscopic Surgery Units, Department of Surgery, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel.

Address reprint requests to Hasan Kais, Transplantation and Advanced Endoscopic Surgery Units, Department of Surgery, Tel Aviv Sourasky Medical Center, 6 Weizman Street, Tel Aviv, 64239, Israel.

© 2003 by Elsevier Science Inc.
360 Park Avenue South, New York, NY 10010-1710

DOI: 10.1016/S0041-1345(03)00005-8


603