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Experience with laparoscopic donor nephrectomy at a European transplant centre

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Abstract Renal grafts from live donors represent an important source for transplantation of end stage renal failure patients. Postoperative short- and long-term comfort is essential. Laparoscopic nephrectomy was performed in 22 cases. The left kidney was preferred for optimal length of the vessels. One procedure was converted to open surgery because of venous bleeding. Warm ischemia time varied between 4 and 7.5 min. Urine production started peroperatively in all cases, and the renal function was excellent. Shoulder pain 1–3 days postoperatively

was observed in seven patients; the rest were comfortable on peroral non-opioid analgesia. The patients were discharged at postoperative days 3–9, and returned to work 2–4 weeks later as compared to 4–8 weeks after open nephrectomy at our centre. Laparoscopic donor nephrectomy in the hands of experienced laparoscopic and transplant surgeons is a safe operation with less discomfort to the living kidney donor.

Key words Laparoscopy · Donor · Nephrectomy

Introduction

Kidney transplantation is considered the best treatment of end stage renal failure [8]. The number of kidneys suitable for transplantation from cadaver donors has decreased during the last decade. Transplant centers have tried to compensate for this decrease by recruiting living related kidney donors. In Sweden, about one-third of renal transplantations were performed with grafts from living donors in 1997 [1]. To minimize the discomfort for the patients, several means of accesses have been used [4, 7]. Theoretically the laparoscopic technique has many advances for live donor nephrectomies, of which the most important is less physical trauma with less postoperative pain and a shorter period of convalescence. We have used the laparoscopic technique on 22 patients and this is a report of our experiences.

Material and methods

During the period 1 February 1998 to 1 June 1999, 22 patients, 13 thirteen women and nine men, aged 31–71 years underwent donor nephrectomy with laparoscopic technique. Left nephrectomy was used because of anatomical advantages regarding the length of the renal vessels. The procedures were performed in cooperation with surgeons specializing in laparoscopic surgery and experienced transplant surgeons. The patients were positioned on the right side and four 12-mm ports were used for access, one in the inferior edge of the umbilicus and three in a half-circle in the left flank. The tissue dissection was performed with an ultrasound harmonic knife. After mobilization of the left colon, Gerota's fascia was dissected and the ureter and the renal vessels were dissected free. Double metal clips were used to occlude the renal artery and the ureter and the vein was divided with cutting vessel staples. The kidney was placed in a plastic extraction bag and extirpated through a 6 cm long median incision below the umbilicus.

Results

Twenty-one of 22 operations were performed laparoscopically without complications. One procedure was converted to open surgery because of bleeding from a branch of the renal vein. The procedure time varied from 1 h and 40 min to 4 h, decreasing with experience, and warm ischemia time varied from 3.5 to 7.5 min. Apart from the patient who had to be converted, bleeding was negligible, though in two cases nearly 500 ml. Postoperatively, seven patients suffered from shoulder pain for 2–3 days. The rest of the patients were managed on peroral non-opioid analgesics for 2–3 days with minimal discomfort.

These preliminary results are similar to experience from American centers, stating that laparoscopic donor nephrectomy can be performed safely without serious complications [5, 6, 7]. Postoperatively the patients were discharged after 3–9 days with a median of 5 days and the period off work was between 12 and 32 days with a median of 28 days. All the patients have subsequently expressed their satisfaction with the unexpected lack of discomfort and the good cosmetic results. All the kidneys started urine production a few minutes after blood circulation. Kidney function has been as expected after this type of transplantation and comparable to kidney function after open live donor nephrectomies.

Discussion

Prospective randomized studies comparing laparoscopic and open procedure nephrectomies have never been published. For the open procedure, we use horizontal incision a few centimeters above the umbilicus from the median line and 15–20 centimeters laterally [2]. The patient is positioned on their back and the kidney is dissected retroperitoneally. This technique is chosen to avoid hernias and neurinomas and to minimize damage to the abdominal musculature because of minimal

damage to muscle innervation. The cosmetic result is excellent after this procedure. However, the laparoscopic technique is followed by less discomfort to the patient and a shorter period of convalescence, which is concordant with the results reported by other centers [4, 7]. There is still great variability in recovery time, but in our experience the time off work is halved compared to patients operated with open access. Live kidney donors have been reported to manage well and to have a longer survival time than the normal population [3]. This is to be expected, as the population of renal donors is selected and all donors are examined pre-operatively and found completely healthy. Though there is no evidence that the procedure has any influence on long-term survival. The costs of the procedure are increased when a laparoscopic technique is used and the time in the operation theatre is prolonged compared to the open surgery technique. However, taking into consideration a shorter recovery time with less discomfort to the patients, the use of the laparoscopic technique is hardly more expensive. Dialysis of any kind is very expensive and every transplanted kidney represents a cost benefit for society as well as benefit for the patient, who can live an almost normal life and often return to work.

The need for kidneys for transplantation is huge. The numbers of cadaver kidneys have decreased during the last decade. At the same time, the age of the cadaver donors has increased, with an increasing risk of impaired graft function as well as graft survival. The recipient of a kidney from a living donor has many advantages, such as no time on the waiting list, possibility of being transplanted in a pre-dialytic condition and the benefit of receiving a better kidney. The choice of surgical technique has to be based on medical factors primarily, and what is the most beneficial for the donor. However, a technique that offers less discomfort, shorter recovery time, and a more satisfying cosmetic result may be beneficial for the recruitment of living kidney donors in the future.

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