Transpl Int (1998) 11: 277–280
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ORIGINAL ARTICLE

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# Management of lymphoceles after kidney transplantation

Received: 17 October 1997
Accepted: 14 January 1998

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**Abstract** Post-transplant lymphoceles (LC) may lead to impaired graft function. Treatment modalities include fine-needle aspiration, percutaneous drainage, and surgical internal drainage. Recently, laparoscopic fenestration has been performed with good results, but experience is still limited. Between January 1991 and August 1996, 919 kidney transplantations were performed in 876 patients at our department. There were 745 first, 133 second, 30 third, 9 fourth, and 2 fifth operations. Sixty-three symptomatic LCs were detected in 62 patients (6.8 %) after 39 ± 31 days. In 44 % of the cases, graft function was impaired; in 29 % hydronephrosis was documented and in 6 % infection of the LC. Forty-five of the 62 patients with LC (73 %) had histologically proven rejection. Thirty-five of the 63 LCs were drained percutaneously, 20 LCs were internally drained by open surgery, and 8 LCs were drained by laparoscopy. In 14 of the 47 patients (30 %) with primary percutaneous drainage, LC recurred; infection occurred in 17 %. Twelve of these patients underwent surgery. One surgical redrainage was necessary after open fenestration. No conversion or complication was noted in the laparoscopy group. We conclude that surgery for post-transplant lymphoceles is safe and effective. We favor the laparoscopic technique in selected patients.

**Key words** Lymphocele, kidney transplantation · Kidney transplantation, lymphocele

## Introduction

The development of a lymphocele is a well-known complication following renal transplantation and may lead to impaired graft function as well as to other clinical symptoms. The reported incidence ranges from 0.6 % up to 18 %, even in experienced centers [6]. After diagnostic verification by ultrasound or CT, as well as by fluid aspiration, therapeutic options range from needle aspiration with or without injection of sclerosant to external drainage and surgical internal fenestration. The recent trend towards minimally invasive surgery has offered another method of treatment – laparoscopic fenestration – first employed by McCullough et al. [11]. This method has already been advocated as the procedure of choice for post-transplantation lymphoceles, but experience is still limited [1–5, 7, 8, 10–15, 18–21] and conversion rates to open laparotomy have been reported in up to 36 % of cases [5].

At our own department, we started to perform laparoscopic fenestration in 1992. After reporting about treatment of post-transplantation lymphoceles in the "prelaparoscopic era" in 1990 [9], this study was undertaken to analyze our recent experience from 1991 to the present. We were especially interested in evaluating the role of the new laparoscopic procedure.

## Patients and methods

Between 1 January 1991 and 15 August 1996, 919 kidney transplantations in 876 adults were performed at the University Clinic of Surgery in Vienna. A standard technique was used that involved retroperitoneally placing the renal homograft into the iliac fossa of the recipient. There were 745 primary, 133 second, 30 third, 9 fourth, and 2 fifth transplantations. The postoperative course was monitored by physical examination, lab tests including serum creatinine, and frequent ultrasound exams or CT scans.

Sixty-three symptomatic LCs occurred in 62 patients (overall incidence 6.8 %). The group consisted of 24 male and 38 female patients (mean age 47 ± 12 years), and LCs manifested 39 ± 31 days (range 3–143days) after transplantation.

LCs were treated either by percutaneous drainage, open surgical drainage, or laparoscopic drainage. Percutaneous and open surgical drainage were performed as described previously [9]. Laparoscopic drainage was conducted under general anesthesia using an incision at the umbilicus to first create a pneumoperitoneum and then to insert the camera trocar. A 30° laparoscope was inserted and the abdominal cavity inspected. Two additional 5-mm trocars were inserted, depending on the location of the LC, and a wide oval excision of the LC wall was performed using a forceps and endoscissors. The resected specimen was preserved for histological examination. When possible, part of the greater omentum was moved into the LC cavity and secured with metal clips or sutures.

Statistical analysis was performed using the Kaplan-Meier estimation and the chi-square test, where a $P$ value below 0.05 was considered significant.

## Results

When we analyzed the frequency of postoperative LCs with respect to the number of transplanted organs per patient, we found that the percentage of LCs increased markedly, from 6% in patients undergoing their first transplantation to as much as 50% in those receiving a fifth transplant (Table 1). These results prompted us to test for a possible role of immunological reactions in the development of LCs. We found that in 45 of 62 patients (73%), an acute rejection episode occurred within the first 3 months after surgery. Of these, 37% were classified as mild rejections (requiring corticosteroid treatment only), whereas 63% were severe rejections requiring antibody treatment. In three cases, the organ was lost due to immunological problems within 3 months post-transplantation (Table 2). In comparison, the rate of acute rejections in patients without LC was 62% within the first 3 postoperative months. The difference was not statistically significant.

Of the 63 symptomatic LCs, 44% presented with a decrease in renal function, 29% with a dilated urinary tract system, and 6% were found to be primarily infected.

Thirty-five of the 63 LCs (55%) were treated by percutaneous drainage, 20 (32%) received open surgical drainage, and 8 (13%) laparoscopic drainage. In both surgical groups, six patients each had been initially treated by percutaneous drainage, but persistent LC eventually required surgery. Complications in patients who received primary percutaneous drainage were local infections in 8 out of 47 (17%) cases; 1 patient had to be operated on because of local abscess formation. In 14 of the 47 cases (30%), LC recurred and was treated by redrainage in 2 cases and by surgical fenestration in 12 cases (6 open and 6 laparoscopic approaches). One second recurrence was seen after redrainage and was again treated by percutaneous drainage.

The complication rate in the surgically treated patients was 3.6%, caused by one insufficient, open fenestration procedure that had to be repeated. In the laparoscopically treated patients, no complication whatsoever was documented. All operations could be completed laparoscopically. Figure 1 demonstrates the effectiveness of internal drainage versus percutaneous drainage in preventing LC recurrence.

In a multivariate Cox regression analysis, we tested the prognostic value of patient age, sex, development of LC, graft function, cold ischemia, and rejection for graft survival. Table 3 shows that rejection and patient age proved to be the only significant factors.

**Table 1** Frequency of postoperative lymphoceles (LC) with respect to the number of (re)transplantations

| No. of transplants | $n$ | Postoperative LC ($n$) | % |
|---|---|---|---|
| 1 | 745 | 46 | 6 |
| 2 | 133 | 12 | 9 |
| 3 | 30 | 3 | 10 |
| 4 | 9 | 1 | 11 |
| 5 | 2 | 1 | 50 |
| Total | 919 | 63 | |

**Table 2** Coincidence of LC and rejection ($n$ = 46)

| Time from operation | Mild rejection ($n$) | Severe rejection ($n$) | Loss of organ ($n$) | Primary nonfunction ($n$) |
|---|---|---|---|---|
| 1 month | 16 | 26 | 3 | 1 |
| 3 months | 17 | 29 | 3 | 1 |

**Table 3** Multivariate analysis (Cox model) of prognostic factors for graft survival

| | $P$ | Relative risk |
|---|---|---|
| Age | 0.002 | –3.03 |
| Sex | NS | 0.09 |
| Group (LC) | NS | 0.14 |
| Function | NS | 0.89 |
| Cold ischemia | NS | –0.15 |
| Rejection | 0.005 | 2.67 |

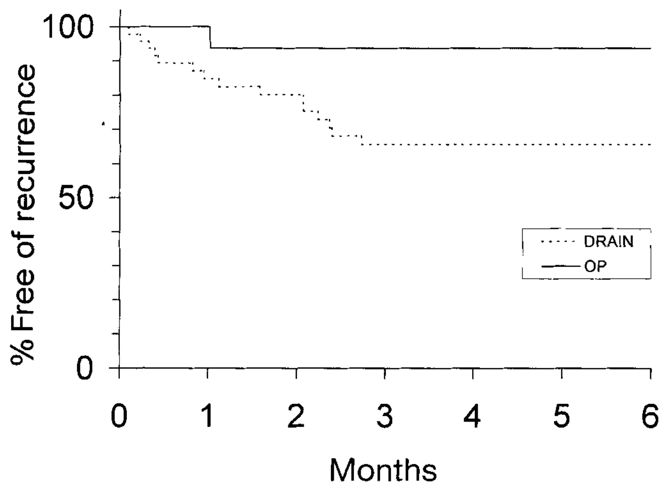


**Fig. 1** Lymphocele recurrence. Kaplan-Meier graph showing the difference in lymphocele (LC) recurrence within the 1st postoperative months between surgically (*solid line*) and percutaneously drained LCs (*broken line*) $P = 0.04$

## Discussion

Several factors may contribute to the development of post-transplant lymphoceles. Technical reasons, such as division of lymphatic vessels during surgery, have been identified, as well as an association with the use of steroids and other drugs and with acute rejection episodes. In our series, we noticed a strong correlation between symptomatic LCs and rejection. Nearly 75 % of patients with LC also required either high-dose steroid treatment for mild rejection or antibody treatment for severe, histologically proven rejection. Although the rate of rejection episodes was not statistically different from that in patients without symptomatic LC (62%), we feel the reason for this might have been the great difference in size of the two groups (63 vs > 800 transplantations).

The overall incidence of LC of 6.8% reported in this study lies well within the range of up to 18% reported in the literature [6]. The rate has increased slightly compared to the 5.4% we reported last [9] despite transplant surgeons' awareness of this complication. On the other hand, our clinic is a teaching institution, which might contribute to some extent.

After a diagnosis of perirenal fluid accumulation by ultrasound or CT, there seems to be wide acceptance of the need for fine-needle fluid aspiration and chemical and bacteriological analysis. As soon as a urinoma has been ruled out, external or internal drainage may be performed. We found that after percutaneous drainage, LC recurred in 30% of cases, the majority of which required surgical internal drainage. In one case, surgical revision of external drainage was needed because of massive infection.

Several authors propose nonsurgical treatment with repeated percutaneous drainage, with or without instillation of sclerosant agents (povidone-iodine [16], alcohol [17], etc.). High recurrence rates, as in our report, and long-term catheterization [17] with increased risk of infection seem to be potential drawbacks. In our series, the main reason for early surgical treatment was recurrence after percutaneous drainage or increasing fluid secretion out of the positioned drain. Except for one patient, who was operated on 12 months after transplantation, all laparoscopic fenestrations were performed within 1–3 months post-transplantation. Our overall surgical complication rate of 3.6% (one reoperation for insufficient, open drainage) was low, and fortunately no complications occurred as a result of laparoscopic procedures.

We conclude that internal and external drainage of post renal transplant lymphoceles are effective treatment modalities. Laparoscopic fenestration is a safe procedure offering the well-known advantages of minimal access surgery and should be employed when conservative treatment fails.

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