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# The optimal treatment of lymphoceles following renal transplantation*

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**Abstract.** Lymphoceles are well-recognized complications following kidney transplantation. The authors describe their experience with the treatment of eight clinically significant lymphoceles (incidence 2.7%). In seven patients percutaneous needle aspiration was attempted, often repeatedly, both for diagnostic and therapeutic purposes. In all of the patients the lymphocele recurred within days and internal marsupialization was therefore performed, in the last two patients utilizing minimal access surgery through laparoscopy. There were no postoperative complications or signs of a recurrence of the lymphocele. Patients following the laparoscopic marsupialization had a much briefer hospital stay and postoperative convalescence. Our results confirm that internal marsupialization is the procedure of choice for most post-transplant lymphoceles. Internal marsupialization through laparoscopy should be used in patients who meet the standard criteria for laparoscopy.

**Key words:** Lymphoceles – Laparoscopic treatment, lymphocele – Kidney transplantation, lymphocele

## Introduction

Lymphoceles are well-recognized complications following kidney transplantation. They result from leakage of lymph from severed lymphatic channels around iliac vessels [2, 5, 16, 23, 32] or from interrupted lymphatics of the transplanted kidney [9, 13, 15, 20, 21, 24, 25, 28, 31] into the retroperitoneal space, where it accumulates.

Most lymphoceles are small, clinically insignificant, and resolve spontaneously [2, 12, 18]. Larger lymphoceles may produce clinical symptoms, depending on their size and localization. Most often they compress the iliac vein with ensuing ipsilateral leg swelling, or they can cause hydronephrosis by compression or displacement of the transplant ureter or the bladder. The incidence of clinically symptomatic lymphoceles varies widely from 0.6% to 18% [2, 11]. Treatment using conservative measures that include single or multiple percutaneous needle aspiration [3, 10, 14, 16, 18, 26], external drainage [3, 14, 17, 23, 26, 27], or sclerotherapy [8, 26, 30] is associated with a high recurrence rate or undesirable side effects. The procedure of choice is internal drainage (marsupialization), which allows free access of lymph from the peritransplant retroperitoneal space into the peritoneal cavity, where it is absorbed [1, 10–12, 23]. This report describes our experience with the treatment of lymphoceles with emphasis on the last two cases in which internal marsupialization of the lymphoceles was accomplished using minimal access surgery through laparoscopy.

## Materials and methods

From January 1982 through October 1991, 298 kidney transplants were performed by the Organ Transplant Service of the Walter Reed Army Medical Center.

The kidneys were transplanted retroperitoneally into the iliac fossa using a standard technique. In eight patients (2.7%) clinically significant lymphoceles were found, six in cadaver kidney recipients and two in living related donor kidney recipients. Five patients were men and three were women, with a mean age of 29 ± 3.8 years. The lymphoceles clinically manifested between 1 and 14 weeks (mean 5.6 ± 1.4 weeks) following transplantation. The most common patient complaint was tenderness in the iliac fossa around the graft, with mild to moderate edema of the ipsilateral leg. Ultrasonography confirmed the perirenal fluid collection in all cases, with the signs of dilatation of the urinary tract in half of them. Renal function in these latter patients was decreased. In one early patient, the lymphocele was drained percutaneously with an indwelling catheter left in place for 8 weeks. Because of infection, open surgical drainage had to be performed. In seven patients transcutaneous puncture with aspiration of the lymph was attempted, often repeatedly, but in all cases the fluid collection recurred in a few days. In all of these patients marsupialization of the lymphocele into the peritoneal cavity was therefore performed. In the last two patients internal marsupialization of the lymphocele was accomplished through laparoscopy.

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*Technique of laparoscopic marsupialization*

After general endotracheal anesthesia, the Veres needle is introduced through the umbilicus or right upper quadrant area. The abdominal cavity is insufflated with $CO_2$ to 14 mm of mercury pressure. Three small incisions are made, the first one in the midline below the umbilicus, through which an 11-mm trocar is introduced for the laparoscope with attached video camera. The other two incisions are made in the lower quadrant, opposite the allograft, and are used for introduction of the 5-mm trocars for operating instruments. These trocars are placed lateral to the rectus muscle with the upper trocar just below the level of the umbilicus and the second just below McBurney's point. The patient is turned head down, the area of the renal allograft is visualized, and the lymphocele identified. Needle aspiration of the content confirms the correct location. Using electrocautery and scissors, an adequate section of the lymphocele wall is excised and loculations, if present, are broken using blunt dissecting instruments. The content of the lymphocele is aspirated, the cavity irrigated with normal saline, and careful hemostasis is assured. The instruments and 5-mm ports are removed, $CO_2$ is allowed to escape through the 11-mm port, which is also removed, and the skin incisions are closed using the skin stapling device.

## Results

Percutaneous needle aspiration was attempted in seven of eight patients with clinically significant lymphoceles, both for diagnostic and therapeutic purposes. In four patients the needle aspiration was performed once, in one patient twice, and in three patients three times. The composition of the aspirate was compatible with lymph in all cases, and all bacteriological findings were negative. In all patients the lymphocele recurred within days, as confirmed by reappearance of clinical symptoms and by ultrasonographic findings. In one patient the lymphocele was primarily drained with the indwelling catheter for 5 weeks. The lymphocele recurred 3 days after the catheter was removed. During the second attempt to drain it by catheter for 3 weeks, it became infected and open external drainage had to be performed; this eventually healed. The kidney remained functional.

Seven patients with previous unsuccessful percutaneous needle aspirations underwent internal marsupialization of the lymphocele. There was no difference in the final outcome whether the operation was performed through the previous transplant incision or through laparoscopy. In all of the patients the postoperative course was uneventful and clinical symptoms of lymphocele subsided. There was no sign of a recurrence of the lymphocele 3 months to 9 years following marsupialization. The only differences between the two procedures were the much briefer hospital stay and briefer postoperative convalescence following the laparoscopic marsupialization.

## Discussion

The exact cause of lymphocele formation following renal transplantation in an individual patient is usually unknown. From the clinical course, two different entities can be established:

1. Perioperative lymphoceles, forming the majority of cases, which develop within weeks of transplantation and are mostly caused by the lymph leakage from recipient lymphatics transected at operation [2, 5, 16, 17, 23, 32]. As suggested by the wide variation in their incidence, they are normally due to technical errors at the time of operation and can be prevented by the careful ligation of the severed recipient lymphatic vessels. In some instances they can be due to the leakage of lymph from the transected lymphatics of the kidney graft [6, 34] before the connection between the graft-recipient lymphatics is established.

2. Late lymphoceles, which develop several years after kidney transplantation and are very rare. The cause of seven out of ten late lymphoceles reported in the literature [7, 9, 13, 15, 20, 21, 24, 25, 28, 31] was diffuse leakage of lymph from the kidney surface due to a variety of reasons.

Diagnosis of symptomatic lymphoceles is confirmed by ultrasonography and needle aspiration with chemical and bacteriological analysis. The concentrations of the chemical constituents equal to or less than serum values distinguish lymphocele from urinoma. Numerous methods of treatment of the lymphoceles following renal transplantation have been employed. Percutaneous needle aspiration should always be used first to confirm the diagnosis, but its therapeutic value is limited because of the high recurrence rate and increased risk of infection when used repeatedly [11, 14, 18]. Percutaneous catheter drainage brings the same risks, e.g., recurrence and infection. Prolonged duration of drainage for 2 weeks to 3 months seems to increase the success rate [14, 33]. For treatment of infected lymphoceles, external drainage is always necessary. Installation of sclerosing agents (tetracedyl sulfate, providone-iodine, tetracycline) by needle or by catheter into the lymphocele cavity brings encouraging results [8, 14, 29] but increases the risk of possible future surgical transplant exploration because of the ensuing scarring. All of the abovementioned methods have one common drawback – prolonged treatment time.

Internal marsupialization of post-transplant lymphocele, which can be accomplished either through the transplant incision or through a midline laparotomy, gives the best results. Recurrence following marsupialization is rare and can be prevented by creating a broad peritoneal window [4, 12, 18], using an internal stent or omentoplasty [4, 22]. Recently, McCullough et al. described one patient with post-transplant lymphocele that was successfully drained into the peritoneal cavity using laparoscopy [19]. We used internal marsupialization of the lymphoceles through laparoscopy in two patients. They tolerated the procedure well and were ready for discharge the next day. Thus far, there have been no signs of recurrence.

In our opinion, internal marsupialization of the lymphocele is an effective procedure that should be used in most patients with symptomatic lymphoceles following transplantation. Laparoscopic marsupialization, which shortens the hospital stay and causes minimal discomfort to the patients, can be utilized in patients who meet the standard criteria for laparoscopy.

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