



## Management of Lymphocele Formation Following Kidney Transplantation: A Single Centre Experience

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### Abstract

**Background:** A lymphocele is defined as a collection of lymph that accumulates in the postoperative field in a nonepithelialized cavity. Incidence ranges from 0.6% to 18% depending on various studies.<sup>1</sup> Management of lymphocele varies from simple aspiration or aspiration with sclerotherapy to more invasive technique, such as internal/external drainage.<sup>2-9</sup> We present our experience in the management of 13 patients who developed pelvic lymphocele after renal transplant.

**Materials and Methods:** Between January 2014 and December 2016, a total of 13 patients after renal transplant were treated in our institution for post-transplant lymphocele formation that occurred during follow-up at the transplant outpatient department. Retrospectively analysis of the clinical data of these patients was done.

**Results:** All thirteen patients who had a clinically significant lymphocele post renal transplant underwent first ultrasound guided aspiration of lymphocele. Five out of 13 patients had successful treatment with percutaneous aspiration alone. Two patients became asymptomatic after percutaneous drain placement and sclerosant injection. Six patients who failed percutaneous drain insertion therapy after aspiration underwent marsupialization. Laparoscopic marsupialization was done in four patients and open marsupialization was done in one patient. One patient had open procedure after failed laparoscopy procedure.

**Conclusion:** Most patients with lymphocele post renal transplant may be asymptomatic. Management of lymphocele depend upon symptoms and renal function and should be in a step ladder fashion . It usually starts from percutaneous drainage to laparoscopic marsupialization to open surgical approach.

**Keywords:** Lymphocele; Percutaneous drainage; Marsupialization; Post renal transplant.

### Introduction

Lymphocele by definition is the collection of lymph that is contained by a pseudomembrane. The lymph can origin from the lymphatic vessels either in the sinus of the transplanted kidney or surrounding the iliac vessels of the recipient.<sup>1,2</sup>

The reported incidence of lymphoceles ranges widely, from 1%–2% to as high as 20%.<sup>1,2</sup> Use of immunosuppressants, acute rejection, length of surgery and extent of dissection are the various factors associated with the aetiology of lymphocele .<sup>1,2</sup> Small lymphoceles are usually

asymptomatic, but large ones can cause compression of the pelvicalyceal system, resulting in hydronephrosis and worsening renal function.<sup>3</sup> Lymphoceles commonly present with abdominal pain, lower limb oedema and urinary retention in the transplanted kidney, resulting in impaired graft function. It is most commonly diagnosed with ultrasonography. Various treatment approaches of lymphocele includes from simple aspiration to drainage with sclerosant injection and marsupialization procedures.<sup>2-9</sup>

### **Aim and objectives**

The aim of this study was to review the management of patients who developed lymphocele post renal transplantation.

### **Materials & Methods**

#### **Study Sample**

Between January 2014 and December 2016, thirteen patients with a mean age of 50.5 years (range 20 to 70) who had a clinically significant lymphocele post renal transplant was treated at our institution.

#### **Inclusion criteria**

All cases of symptomatic lymphocele post renal transplant

#### **Exclusion criteria**

1. All patients having other urological complications post renal transplant
2. A follow-up of <12 months.

Between our study period, 104 patients underwent renal transplant in our institute. Though various surgeons performed this surgeries but the surgical techniques used were the same. All lymphatic channels of the recipient's iliac arteries and veins encountered during dissection were either ligated with sutures or small titanium clips or diathermised. The graft kidney was placed in the iliac fossa. The renal vessels were anastomosed to the iliac vessels and the ureter was implanted into the bladder. All ureters were anastomosed by the Lich-Gregoire procedure. In the Lich-Gregoire technique, the bladder mucosa is reached via a single cystotomy, and the distal ureter is sutured

to the mucosa with an absorbable monofilament 5-0 suture. Subsequently, a tunnel is created to prevent reflux. A double J stent was routinely inserted in the implanted ureter and was removed after 6 weeks in the majority of cases. A surgical drain was also inserted and was removed usually at 4 to 5 days after surgery. The Foley catheter was removed 5-7 days post-procedure. Postoperatively a baseline ultrasonography of the transplanted kidney was performed and repeated whenever indicated. Patients with lymphoceles were managed conservatively if they were asymptomatic. However, intervention was considered necessary if the patient was symptomatic and having either hydronephrosis or worsening of renal function. A step ladder approach was used in symptomatic patients which included percutaneous aspiration or drainage of the collection with sclerosant injection and surgical drainage via laparoscopy, or open drainage. Under ultrasonography guidance percutaneous drainage was routinely performed by an interventional radiologist. In patients who underwent surgical drainage, the omentum was inserted into the peritoneal window to prevent closure. Urinoma was usually excluded by routine measurement of creatinine level in aspirated fluid.

### **Results**

Lymphocele occurred in 13 (12.5%) patients out of 104 patients who underwent renal transplantations. The mean age of diagnosis was 50.5 years (range 20-70). The median onset of occurrence was 21 (range 9-32) days after surgery. The median operative time was 120 mins. Ultrasonography was used for diagnosis of lymphocele. The median maximum diameter of the lymphoceles was 5.5 (range 1.5-8.0) cm. The site of occurrence of lymphoceles included the inferior (n = 9), lateral (n = 2), upper (n = 1) and medial (n = 1) poles of the transplanted kidneys. Ten out of the thirteen patients (76.9%) diagnosed with lymphocele had received cadaveric transplants, while 3 (23.08%) patient received a living transplant from a relative. Out of these

thirteen patients, 7 (53.8%) had no hydronephrosis at presentation and 6 (46.15%) patients developed clinically significant hydronephrosis. Nine (69.23%) had clinically elevated creatinine levels and 6 (46.15%) were on macrolides such as tacrolimus, sirolimus and everolimus. There were no delayed graft functions or acute graft rejection . All these patients underwent first ultrasound guided aspiration of lymphocele (Fig.1). Five (38.46%) out of 13 patients had successful treatment with percutaneous aspiration alone. Two (15.38%) patients became asymptomatic after percutaneous drain placement and sclerosant injection. Six (46.15) patients who failed percutaneous drain insertion therapy after aspiration underwent marsupilization. Laparoscopic marsupilization was done in five (38.46%) patients and open marupilization was

done in one (7.69 %) patient. Out of five patients who underwent laparoscopic marsupilization, 4 (80.0%) was successful and 1(20.0%) required open procedure for recurrence. Fluid culture was positive for Klebsiella spp. in only one out of eight patients who required intervention. Among the two patients who eventually underwent open drainage, one each had a sizeable lymphocele measuring > 6 cm, and one had significant hydronephrosis and positive culture. In patients for whom percutaneous treatment failed, indications for intervention were an enlarging lymphocele size leading to worsening of renal function. There was no graft loss in any of the thirteen patients with lymphoceles. There was also no recurrence documented among any of the patients during the follow-up period (median 27 [range 17–36] months) after the final procedure.

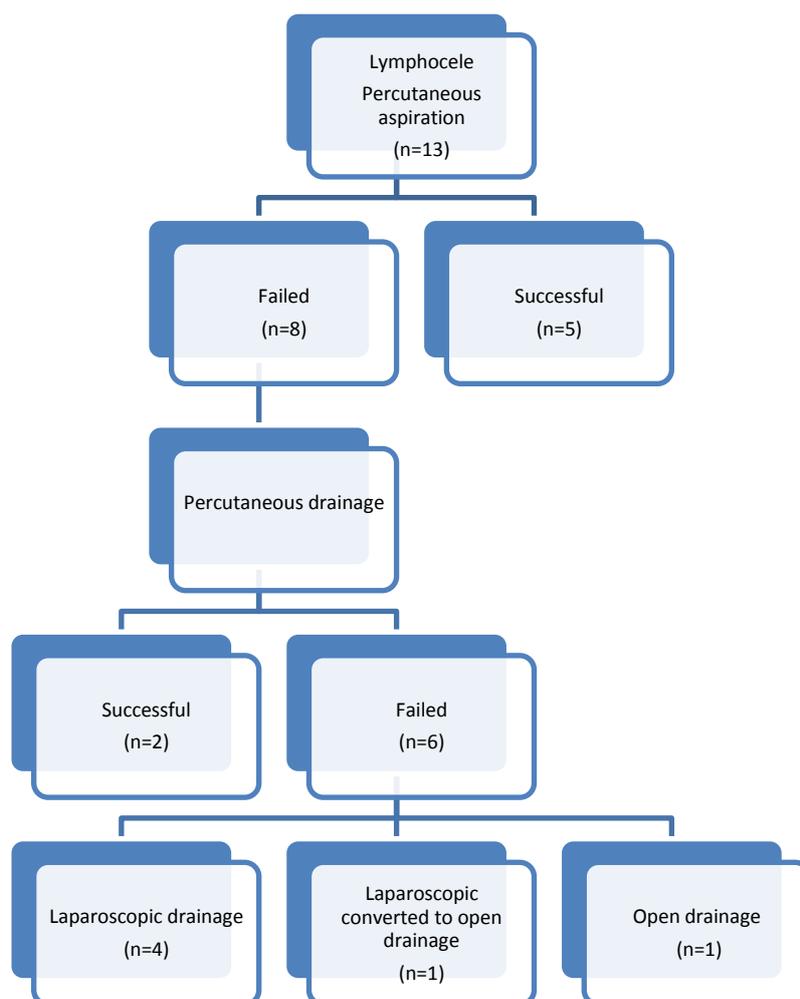


Fig. 1. Chart shows the various treatments received by patients with lymphoceles (n = 13).

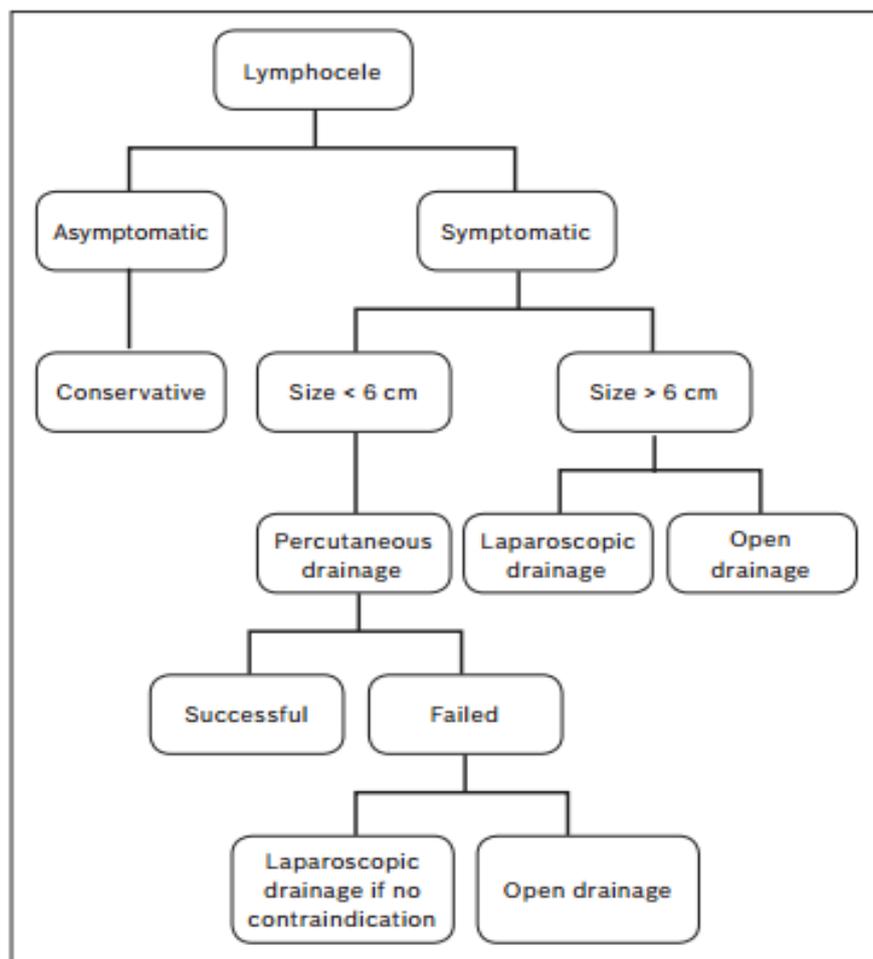


Fig. 2 Chart shows the management algorithm of patients with lymphoceles in the local setting.

## Discussion

In literature the incidence of symptomatic lymphocele is 0.6%–18.0%.<sup>1</sup> In our study the incidence of lymphocele was 12.5% (n = 13). It can be asymptomatic and harmless in many patients and can also seriously affect renal function which may necessitate surgical intervention. Asymptomatic lymphocele usually do not require any therapy. Ultrasonographic follow-up should be done in such cases until the collection is resolved. Symptomatic and large lymphocele therapy aims to efficiently and completely remove the collection. There are various approaches to treat lymphocele but still no gold standard treatment exist. High incidence (50%–100%) of recurrence is associated with percutaneous aspiration of lymphocele.<sup>2</sup> Laparoscopic marsupialisation is considered by some surgeons as the first line treatment of lymphoceles,<sup>2,3</sup> while others have suggested initial

percutaneous aspiration under ultrasonographic guidance, followed by sclerotherapy to prevent reaccumulation of fluid.<sup>4,6</sup> Recurrence risk of lymphocele has been shown to reduce (range 13%–33%)<sup>7-9</sup> with percutaneous aspiration as has additional sclerotherapy (range 6%–25%).<sup>2,4,7</sup> Doxycycline and ethanol are common sclerosing agents used in sclerotherapy.<sup>5</sup> Other sclerosing agents which can be used are povidone-iodine, talc and bleomycin. Some authors suggest that sclerosing agents can have toxic effects on graft functions and may even cause graft loss while some consider them generally safe and highly successful.<sup>10,11</sup> Surgical procedures include marsupialisation, or external drainage via open or laparoscopic technique. The recommended surgical intervention for lymphoceles is laparoscopic marsupialisation, as it is less invasive, and has shorter operative time and hospital stay, as well as better cosmesis. The recurrence rates

following it (range 6%–12%)<sup>2,7</sup> and open drainage (range 6.7%–13%)<sup>3,7</sup> are comparable. In our study, conservative and less invasive treatment, such as percutaneous drainage, was successful in 53.84% of patients. Among the six patients who had surgical intervention, four underwent laparoscopic marsupialisation, one underwent open drainage as an initial procedure and one after laparoscopy failure. Three of these patients had larger sized lymphoceles (> 6 cm in diameter) as shown by various authors.<sup>12</sup> Regardless of treatment approach used in our study, no recurrence was observed.

Incidence of lymphocele post renal transplant has shown to increase with the introduction of newer immunosuppressants, such as tacrolimus, sirolimus and everolimus.<sup>13</sup> Sirolimus is a powerful immunosuppressant for renal transplant recipients but it is associated with a higher frequency of lymphocele formation.<sup>13,14</sup> Lymphocele formation is more with sirolimus compared to mycophenolate mofetil as shown by Srivastava et al.<sup>15</sup> The incidence of lymphocele may decrease by avoiding the use of sirolimus in renal transplant recipients at the early postoperative period although the exact mechanism remain doubtful.<sup>14,15</sup>

An algorithm for the management of post-transplantation lymphoceles can be used as proposed by Sim A et al (Fig. 2).<sup>16</sup>

The initial management of a post-transplantation patient with lymphocele depend on various factors such as the size of the lymphocele, the symptoms observed, as well as the presence of hydronephrosis, impaired renal function or concomitant infection. Percutaneous aspiration and drainage is usually the initial treatment which should be offered to patients. Surgical procedures should be offered to patients with a collection > 6 cm in diameter or in the event of a failed percutaneous intervention. Laparoscopic drainage is the standard treatment unless it is contraindicated due to small volume (< 100 mL) of fluid, previous abdominal surgery, suspicion of

infection, as well as location of lymphocele near the bladder, ureter or renal hilum.

Percutaneous procedures although provide minimally invasive intervention for treating lymphocele, it did not provide a definitive treatment. Higher recurrence rate, prolonged hospital stay, higher costs and more complications was found to be associated with percutaneous drainage.<sup>16</sup> In order to shorten hospital stay and prevent further complications surgical intervention should be considered earlier in the treatment of patients with post transplantation lymphocele.

### Conclusion

The incidence of lymphocele in renal transplant recipients has been decreased due to improvement of transplant surgery techniques. Most of these lymphoceles can now be successfully treated with percutaneous and laparoscopy procedures. Open surgical procedures are employed mainly in patients with contraindication for laparoscopic procedures and those having recurrence after laparoscopy surgery. Kidney function improve in the patients being treated early and graft loss can be avoided.

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