Original article

Management of lymphocele after kidney transplantation: twenty years' experience in a high-complexity clinic

Manejo del linfocele después del trasplante renal: veinte años de experiencia en una clínica de alta complejidad

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Abstract

Objective: To describe the 20-year experience of a high-complexity clinic in southwestern Colombia regarding the percutaneous and laparoscopic management of post-kidney transplant lymphocele (PKTL).

Methods: We conducted a retrospective, descriptive, and observational study to identify patients diagnosed with lymphocele through the kidney transplant program database. Demographic and clinical data were collected, including comorbidities, risk factors for lymphocele development, and treatment outcomes. Inclusion criteria included patients aged ≥18 years with a diagnosis of lymphocele following kidney transplantation and with complete medical records available. Data were compiled using Excel and analyzed with Stata 14.0®.

Results: We included 31 patients with post-kidney transplant lymphocele between 2000 and 2020. Of these, 19 were male and 12 female; the median age was 46 years, and the median body mass index was 22.7 kg/m². The most common comorbidities were hypertension and type 2 diabetes mellitus. The median time to initial diagnosis was 41 days, and the median lymphocele volume was 240 mL. Recurrence following percutaneous treatment occurred in 77 % of cases, while no recurrence was observed in patients who underwent laparoscopic marsupialization.

Conclusions: PKTL is a common complication occurring within the first 45 days post-transplantation. Although percutaneous management is linked to a high recurrence rate, it may be utilized as a first-line treatment. In cases of treatment failure, the laparoscopic approach should be regarded as the standard of care due to its favorable outcomes.

Keywords:
Lymphocele, renal transplant, percutaneous drainage, marsupialization, laparoscopy

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Resumen

Objetivo: Describir la experiencia de 20 años de una clínica de alta complejidad en el suroccidente colombiano en el manejo percutáneo y laparoscópico del linfocele postrasplante renal (PKTL).

Métodos: Se realizó un estudio retrospectivo, descriptivo y observacional para identificar pacientes con diagnóstico de linfocele a través de la base de datos del programa de trasplante renal. Se recopilaron datos demográficos y clínicos, incluyendo comorbilidades, factores de riesgo para el desarrollo de linfocele y resultados del tratamiento. Los criterios de inclusión incluyeron pacientes ≥18 años con diagnóstico de linfocele postrasplante renal y con historia clínica completa disponible. Los datos se recopilaron en Excel y se analizaron con Stata 14.0®.

Resultados: Se incluyeron 31 pacientes con linfocele postrasplante renal entre 2000 y 2020. De ellos, 19 eran hombres y 12 mujeres; la mediana de edad fue de 46 años y la mediana del índice de masa corporal fue de 22,7 kg/m². Las comorbilidades más frecuentes fueron hipertensión y diabetes *mellitus* tipo 2. La mediana de tiempo hasta el diagnóstico inicial fue de 41 días y la mediana del volumen del linfocele fue de 240 ml. Se observó recurrencia tras el tratamiento percutáneo en el 77 % de los casos, mientras que no se observó recurrencia en los pacientes sometidos a marsupialización laparoscópica.

Conclusiones: La PKTL es una complicación frecuente que se presenta durante los primeros 45 días postrasplante. Si bien el manejo percutáneo se asocia a una alta tasa de recurrencia, puede utilizarse como tratamiento de primera línea. En caso de fracaso del tratamiento, el abordaje laparoscópico debe considerarse el estándar de atención debido a sus resultados favorables

Palabras clave:
Linfocele, trasplante renal, drenaje percutáneo, marsupialización, laparoscopia

Introduction

Lymphocele is one of the most significant complications observed in patients undergoing kidney transplantation.[1,2] The incidence of symptomatic lymphoceles ranges from 0.6 % to 26 %.[3–6] Most lymphoceles develop early after transplantation, typically occurring between two weeks and six months postoperatively, with peak incidence around the sixth week post-transplant.[7–9] Several factors have been implicated in the development of lymphoceles, including recipient-related variables such as age, sex, body mass index (BMI), and duration of dialysis; donor type (living or deceased); extensive perivascular dissection during mobilization of native vessels; capsular tears; episodes of acute rejection; graft biopsy; the presence of arteriovenous fistulas in the lower limbs; and the use of diuretics, high-dose corticosteroids, and anticoagulants, among others.[9,10]

The pathogenesis of post-kidney transplantation lymphocele (PKTL) remains unclear.[11] Lymphoceles exhibit a variable clinical presentation, and appropriate treatment is not straightforward. Small asymptomatic collections can be managed expectantly;[12] conversely, extensive symptomatic collections require intervention. Ultrasound-guided fluid aspiration or drainage procedures (with or without sclerotherapy) are simple but have high recurrence rates. Alternatively, open

or laparoscopic marsupialization with pseudo-membrane fenestration provides lower recurrence rates. This study aimed to describe the demographic and clinical characteristics of the patients, along with our experience in the percutaneous and laparoscopic management of post-kidney transplant lymphoceles (PKTL) at a high-complexity referral center in southwestern Colombia.

Methods

A retrospective, descriptive, and observational study was conducted from January 2000 to December 2020. Patients diagnosed with post-kidney transplant lymphocele (PKTL) were identified at Clínica Imbanaco – Quirón-Salud Group in Cali, Colombia. We included adult patients (≥18 years) with a confirmed diagnosis of PKTL. Patients were excluded if their clinical records were incomplete or if follow-up lasted less than six weeks after the intervention. The experience of the attending physician influenced the decisions regarding the interventions.

The variables analyzed included demographic and pre-transplant characteristics such as age, sex, body mass index (BMI), and presence of comorbidities. Transplant-related variables comprised the type of donor (living or deceased), cold ischemia time (in hours), and the laterality of the transplanted kidney (right, left, or bilateral). Regarding the lymphocele itself, the following aspects were assessed: time to diagnosis, presence of hydronephrosis, serum creatinine levels at the time of diagnosis, lymphocele volume (measured in cubic centimeters), and the presence of infection, including the identification of any microorganisms involved. Additionally, the type of treatment administered—either percutaneous or surgical—and recurrence rates according to treatment modality were recorded.

Quantitative variables were summarized using measures of central tendency (mean or median) and dispersion (standard deviation or interquartile range), depending on the distribution of the data. Categorical variables were expressed as absolute and relative frequencies. Data were extracted from the institution's electronic medical records system and entered into a database using Microsoft Excel version 16.21. Statistical analysis was conducted using STATA version 14.0 (StataCorp, College Station, TX, USA). The study adhered to both institutional and international ethical standards for research involving human subjects.

Results

We included 31 patients with post-kidney transplant lymphocele (PKTL). Nineteen were male. The median age was 46 years (IQR 31–56), and the median body mass index (BMI) at the time of transplantation was 22.7 kg/m² (IQR 21.5–26.4). The most common comorbidities were hypertension, present in 51 % of patients, and type 2 diabetes mellitus, observed in 25 %. Most transplants (96 %) were performed using grafts from deceased donors, with a median cold ischemia time of 14 hours (IQR 11–17), while the remaining cases involved living donors, primarily related family members (Table 1).

Table 1. Characteristics of the patients prior to the diagnosis of post-kidney transplant lymphocele

Variable	Patients	
	n	%
Sex		
Males	19	61.29
Females	12	38.71
Age		
Median (IQR)	31	46 (31-56)
Body mass index (Kg/m2)		
Median (RIQ)	31	22.7 (21.5-26.4)
Comorbidities		
Arterial hypertension	16	51.61
Type 2 - Diabetes Mellitus	8	25.81
Systemic erythematosus lupus	2	6.45
Others	5	16.13
Kidney Transplant		
Donor		
Living	1	3.23
Cadaveric	30	96.77
Laterality		
Right	17	54.84
Left	14	45.16
Ischemia Time (hours)		
Median (IQR)	31	14 (11-17)

Regarding lymphocele characteristics, the median time from transplantation to diagnosis was 41 days (IQR 20–133). The median lymphocele volume at diagnosis, as measured by ultrasound, was 240 mL (IQR 40–691), and the median serum creatinine level was 1.5 mg/dL (IQR 1.12–2.16). Infection occurred in 16 % of patients with variable pathogens identified on culture.

In terms of treatment, seven patients were managed expectantly, while 24 underwent percutaneous drainage. Of those who received drainage, 15 required two procedures, and two patients needed three or more. Marsupialization was performed on nine patients, of whom eight underwent a laparoscopic approach.

Recurrence after percutaneous drainage occurred in 77 % of the cases. No recurrence was observed in patients treated with laparoscopic marsupialization, whereas the only patient who underwent open marsupialization experienced a recurrence (Table 2).

Table 2. Characteristics of the management of patients with a diagnosis of lymphocele after kidney transplant

Variable	Patients	
	n	%
Time to diagnosis (days)		
Median (IQR)	31	41 (20-133)
Size at first diagnosis (cc3)		
Median (IQR)	31	240 (40-691)
Serum creatinine (mg/dL)		
Median (IQR)	31	1.54 (1.12-2.16)
Infection		
Yes	5	16.13
No	26	83.87
Germ in culture		
E. Coli	1	20
S. Epidermidis	1	20
Pseudomona a.	1	20
S. Aureus	1	20
Enterobacter Cloacae	1	20
Percutaneous aspiration/drainage		
0 (Expectant management)	7	22.58
1	15	48.39
2	7	22.58
3	1	3.23
5	1	3.23
Marsupialization		
Open	1	11,11
Laparoscopic	8	88,89
Recurrence according to management		
Expectant or Percutaneous	17	77,27
Laparoscopic marsupialization	0	0
Open marsupialization	1	100,00

Discussion

Our results align with those reported in the literature. Most studies indicate that lymphoceles occur four to eight weeks after kidney transplantation, with a peak incidence at six weeks.[7,8,13] Follow-up US protocols have been established for critical days post-transplantation, as US is a diagnostic tool that provides several advantages: it is non-invasive, safe, easy to repeat at frequent intervals, and unaffected by the degree of renal impairment.

It was found that nearly 20 % of patients diagnosed with PKTL have an infection, which is why it is considered that lymphocyte count, gram stain, and culture should be performed at the time of aspiration or drainage.[14] Additionally, we found a wide variety of germs in our patients.

Failure of percutaneous management.

According to the literature, a high recurrence was found with percutaneous aspiration, with reports of up to 75 %.[15] Lucewicz *et al.*, in a systematic review published in 2011 that included 20 studies with 218 patients, found a recurrence rate of 59 % (95 % CI 10-95) for aspiration only.(16) Percutaneous drainage with a pigtail catheter results in recurrence rates of 25 % to 50 %. Prolonged duration of the pigtail catheter, lasting longer than two weeks, seems to increase the success rate; however, due to their minimally invasive nature, they are considered first-line treatments for lymphocele.[15]

Sclerotherapy

In our study, no data were obtained on sclerotherapy as a management option. However, the use of sclerosing agents for instillation in percutaneous management yields encouraging results. Nonetheless, it increases the likelihood of surgical exploration in patients who do not respond due to the resulting scarring. Since 1983, povidone-iodine has been utilized, acting through protein chelation. A recurrence rate of 37.5 % has been reported after the initial instillation and 18.7 % after the second treatment. Other sclerosing agents used include tetracycline, doxycycline, minocycline, fibrin gum, 95 % ethanol, factor XIII, and fibrinogen. Lymphoceles sclerotherapy is successful in 80-90 % of cases, regardless of the agent used Lucewicz *et al.* found, in a systematic review including 14 studies with 144 patients, a 31 % recurrence rate for sclerotherapy.[16] Opponents of sclerotherapy argue against its use due to the potential risk of fibrosis around the transplant, particularly near the ureter, complicating future procedures.

Failure in the surgical management

Only one patient underwent open surgery and experienced a recurrence. Therefore, based on our study, it is inappropriate to draw conclusions about this issue. In a systematic review analyzing 17 studies involving 176 patients, the recurrence rate following open surgery was 16 %, and the intra-surgical complication rates were 8 %. This suggests that it is a promising treatment option for patients in whom percuta-

neous management fails. Regarding laparoscopic surgery, a recurrence rate of 8 % was noted, with a similar number of complications. The length of hospital stay for the open technique compared to the laparoscopic one was 5.5 days and 2.5 days, respectively.(16) Our findings concerning recurrence align with this study, where no patient experienced a recurrence after undergoing laparoscopic marsupialization. This minimally invasive intervention is established as a good and practical option, shortening hospital stays and causing less discomfort for patients. For this reason, it is considered the standard treatment for this type of condition.

Strengths and Limitations

This is the first study to describe patients with post-kidney transplant lymphocele (PKTL) in our regional setting. Furthermore, the research was conducted according to appropriate methodological standards for descriptive observational studies.

The main limitations include the study's retrospective, observational, and descriptive design, along with the relatively small sample size, which may limit the generalizability of the findings.

Conclusions

Post-kidney transplant lymphocele (PKTL) is a common complication, particularly during the first 45 days after surgery. Although percutaneous drainage is associated with a high recurrence rate, it remains a viable first-line treatment option because of its minimally invasive nature. In cases of treatment failure, laparoscopic marsupialization should be regarded as the standard of care, considering its favorable outcomes and lack of recurrence in this series.

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There are no conflicts of interest related to the subject matter of this work.

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