Treatment of the Lymphocele After Kidney Transplantation: A Single-center Experience

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ABSTRACT

Background. Lymphocele is one of the most common complications after kidney transplantation. It is usually asymptomatic, but can cause pressure on the kidney transplant, ureter, bladder, and adjacent vessels with deterioration of graft function, ipsilateral leg edema, and external iliac vein thrombosis. Peritoneal fenestration is a well-established method for treatment. In this report, we present the incidence of symptomatic lymphocele requiring treatment (LRT), demographic and surgical factors that influenced lymphocele formation, its clinical presentation, and 2 types of treatment: open and laparoscopic intraperitoneal drainage in the experience of our center.

Material and Methods. We retrospectively analyzed all kidney transplantations performed between January 2007 and December 2014 in Gdansk Transplantation Center (n = 740) and selected patients with LRT. LRT occurred in 59 cases (8%). All other patients transplanted during the same time (n = 681) were treated as a control group in the univariate and multivariate analysis of risk factors of the lymphocele formation.

Results. Surgical intraperitoneal drainage was performed in an open method in 53 cases and laparoscopically in 6 patients. We observed recurrence of lymphocele in 11 cases (18.6%). Acute rejection episodes (ARE) and delayed graft function (DGF) were more frequent in patients with LRT. ARE and age were independent risk factors for LRT in multivariate analysis. The mean estimated glomerular filtration rate by the Modification of Diet in Renal Disease method at 1 month after the fenestration was higher than before the operation (51.7 and 43.6 mL/min, respectively).

Conclusions. Fenestration is a safe and effective method of treatment of symptomatic lymphocele. ARE, DGF, and older age were associated with a greater risk of LRT.

LYMPHOCELE IS A frequent complication after kidney transplantation (even ≤50%). It is a collection of lymph accumulating in a nonepithelialized cavity in the postoperative field [1]. Causes of lymphocele after kidney transplantation are dissection of the lymphatics around the iliac vessels of the recipient, dissection of donor (hilar lymphatics) during procurement surgery, and preparation of the kidney before transplantation. Without clipping and suture, lymphatics remain open, so careful ligation of recipient and kidney graft lymphatics is strongly recommended. The main source of lymphatic leakage is the recipient; this statement is supported by data from lymphangiography, and analysis of creatine kinase activity in the fluid [2]. Lymphoceles are usually innocuous and asymptomatic, but can equally cause dramatic presentations as a result of pressure on the kidney transplant, ureter and bladder, and adjacent vessels causing, for example, deterioration of graft function, ipsilateral leg edema, and external iliac vein thrombosis. A lymphocele may occur from 2 weeks to 6 months after transplantation with a peak incidence at 6 weeks [3]. The introduction of ultrasound evaluation has

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contributed to an increase in the diagnosis of lymphocele. The reported mean incidence of symptomatic lymphocele is 5.93%, requiring treatment in 5.88% [4]. Laparoscopic procurement of the kidney graft is a risk factor for prolonged lymphatic leak [5]. It is possible that grafts with multiple arteries are associated with an higher incidence of lymphoceles [6]. Lymphatic complications may be related to diabetes, obesity, anticoagulation prophylaxis, high dose of diuretics, delayed graft function (DGF) and immunosuppressive drugs (mammalian target of rapamycin [mTOR] inhibitors, especially in association with steroids, and applied de novo after transplantation). Several studies have demonstrated the association between rejection episodes and lymphatic complications [7]. Surgery as a treatment of lymphocele is necessary in symptomatic, high-pressure lymphoceles and peritoneal fenestration is a well-established method for treatment.

We present the incidence of symptomatic lymphocele requiring treatment (LRT), including demographic and surgical factors that influenced lymphocele formation, its clinical presentation, and the 2 types of treatment (open and laparoscopic lymphocele fenestration) from our center.

MATERIALS AND METHODS

We retrospectively analyzed all 740 patients after kidney transplantations performed between January 2007 and December 2014 in Gdansk Transplantation Center to select patients with LRT. LRT occurred in 59 cases (8%); patient characteristics are presented in Table 1. All other patients (n = 681) were treated as a control group in the univariate and multivariate analysis of risk factors of the lymphocele formation.

Clinical symptoms observed in the studied group were abdominal pain and discomfort, edema in the inguinal region (side of the operation), unilateral leg edema, palpable mass, urgency, and deterioration of graft function. A diagnosis of lymphocele was based generally on ultrasound imaging. In every case, ultrasound of the kidney graft region was performed before, and after, the operation. Additionally, in some cases, computed tomography and magnetic resonance imaging were used.

Patients were qualified for the operation, regardless of the size of the lymphocele, in the presence of severe symptoms, graft function deterioration, and/or signs of kidney compression on ultrasound examination and ineffectiveness of percutaneous drainage. The 2 types of operation were open or laparoscopic procedures. Type of operation was chosen depending on the location of the lymphocele, the quality of the surgical wound, and surgeon choice. The mean time from transplantation to fenestration was 42 days (range, 11–208).

Kidney transplantations were performed in accordance with the standard technique; all grafts were from deceased donors. The transplant renal vessels were implanted on the iliac vessels using an end-to-side anastomosis. Vesicoureteral anastomosis was performed on the posterolateral surface of the bladder with the Gregoire method and stenting of the implanted ureter with a double-J catheter. All structures encountered during dissection were ligated and coagulated. After kidney implantation, the retroperitoneal space was closed in layers using absorbable sutures, a drain in the retroperitoneal space was left. Operations of lymphocele were carried out under general anesthesia in both types. Open surgery was performed when lymphocele had no impressions on the peritoneal cavity, and/or complications with wound healing were observed. In open surgery, the retroperitoneal space was reached through cutting the postoperative scar. After localization of the lymphocele, the common wall between the lymphocele and the peritoneal cavity was excised with electrocautery. The proximal end of the drain was placed in the peritoneal cavity through the window passing the lymphocele. The distal end was output on the skin through a separate incision. A laparoscopic procedure was performed if the lymphocele had an impression on the peritoneal cavity, and no complications with wound healing were observed. Laparoscopic fenestration was performed using 3 trocars to create a window in the peritoneum.

Table 1. Characteristics of Patients After Kidney Transplantation With and Without Lymphocele Requiring Treatment

	Patients With LRT (n = 59)	Patients Without LRT (n = 681)	*P*
Gender			.208
Male	32	429	
Female	27	257	
Age (y), mean (range)	52 (20–74)	48 (15–81)	.028
Method of previous dialysis			
PD	7 (12%)	122 (18%)	.238
HD	47 (80%)	506 (74%)	.373
PREE	5 (8%)	52 (8%)	.819
BM, mean (range)	26 (18–34)	25 (16–35)	.186
Blood type			>.05
O	18	226	
A	28	280	
B	11	125	
AB	2	49	
Cause of ESRD			
GN	18 (30%)	232 (34%)	.202
DM	11 (18.5%)	73 (11%)	.066
ADPKD	10 (17%)	89 (13%)	.403
HN	3 (5%)	67 (10%)	.230
IN	4 (7%)	72 (10.5%)	.356
Not known	11	13	
Other	2	44	
Charlson comorbidity index, mean (range)	3.6 (2–6)	3.1 (2–7)	.006
Immunosuppression			
CSA	22 (37%)	174 (26%)	.051
TAC	37 (63%)	500 (73.4%)	.13
Induction (Sim, Thymo, ATG)	15 (25%)	131 (19%)	.254
mTOR inhibitors (eve, rapa)	5 (8.5%)	24 (3.5%)	.06
First/second and third RTx	50/9 (85%/15%)	620/60 (91%/9%)	.103
Donor age (y), mean	46.5	44.1	.177
Mean WIT (min)	28.7	27.3	.116
Mean CIT (min)	835.4	840.3	.290
Side of kidney transplant–R/L	34.5%/65.5%	39.5%/60.5%	.47

Abbreviations: ADPKD, polycystic kidneys; BMI, body mass index; CIT, cold ischemia time; CSA, cyclosporine; ESRD, end-stage renal disease; eve, everolimus; GN, glomerulonephritis; HD, hemodialysis; HN, hypertensive nephropathy; IN, interstitial nephropathy; L, left; mTOR, mammalian target of rapamycin; PD, peritoneal dialysis; PREE, preemptive kidney transplantation; R, right; RTx, renal transplantation; rapa, rapamycin; Sim, Simulect; TAC, tacrolimus; Thymo, thymoglobulin; WIT, warm ischemia time.