Post Kidney Transplant Lymphoceles: Meticulous Ligation of Lymphatics Reduces Incidence in Comparison with Electrocautery Utilization

Yasir Amer Al Doori *, Kanaan Mahdi Abbas**, Adil Hefdhi Al-Soufi**

ABSTRACT:

BACKGROUND:
Lymphocele is one of the common complications following renal transplantation, and usually present with persistent lymphatic drain in immediate post-transplant period or perigraft (between the kidney allograft and the urinary bladder) collection in post-transplant routine ultrasound (1). Lymphorrhea or lymphorrhagia is defined as a lymph leak from the surgical drains or from the abdominal wall through the surgical wound (2).

AIM OF STUDY:
To compare between lymphatic’s ligation and electrocauterization in reducing post kidney transplantation lymphocele.

PATIENTS AND METHODS:
design: Prospective comparative study. Setting: Kidney Transplant Center in Medical City. Study period: From the 1st August 2017 till 1st August 2019. Sample size: 100 patients with end stage renal disease. Exclusion criteria (Death, graft loss within 4-6 weeks, lack of follow-up).

RESULTS:
In this study, we noticed that lymphocele formation was in 20% of patients who were managed by lymphatic electro cauterization which was significantly higher than that in patients who were managed by meticulous ligation of lymphatics (6%) (P= 0.037). Regarding the mean of duration until drain removal, was significantly higher in cautery group than that in ligation group (7.1 versus 5.8 days, P= 0.02). Intervention needed for symptomatic lymphocele was greater in patients managed by lymphatic electrocauterization which was statistically significant (P= 0.045).

CONCLUSION:
We found that a meticulous surgical technique with ligation of all lymphatics, was significant in reducing the incidence of lymphoceles following kidney transplantation in our recipients.

KEYWORDS: Lymphocele, renal, transplantation, ligation, cauteriy, Iraq.

INTRODUCTION:
Definitions: Lymphocele is one of the common complications following renal transplantation (1).
Post kidney transplant lymphocele:
Lymphoceles are the commonest fluid collections observed after kidney transplantation with an incidence that ranges from 0.6 to 61% (1). The peak time of lymphocele formation is 6 weeks’ post-transplant, but it may emerge from 2 weeks to 6 months’ post-transplant (4).
Etiology: Lymph may accumulate in response to iliac vessel injuries inflicted during vascular anastomoses, damage to the renal allograft hilum, or micro- or macro- encapsulations of the renal allograft hilum and lymphatic vessels of the transplanted kidney (5).

Risk factor for lymphocele formation
Surgical causes
1. Dissection of lymphatics around the iliac vessels of the recipient and donor renal lymphatics.
2. Laparoscopic donor nephrectomy (2).
3. Higher incidence of lymphocele with laparoscopic live donor nephrectomy compared to deceased donor transplants (2).
4. Donor kidneys with complex arterial anatomy carried a higher risk of lymphocele (12.5%) compared to grafts with single renal artery (3.1%) (6).
5. Retransplantation (2).
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Non-surgical causes
1. The use of diuretics (2).
2. Autosomal dominant polycystic kidney disease (ADPKD) (2).
4. The anticoagulation therapy together with the defective coagulation associated with uraemia (7).
5. Obesity of the recipients with a body mass index > 30 kg/m2 (8).
6. Acute tubular necrosis-delay graft function (3).
7. Increase recipient age (9).
8. Warm ischemia time more than 30 minutes (9).
9. Prolonged pre-transplant dialysis (10).
10. Immunosuppressive drugs such as rabbit antithymocyte globulin (ATG) (9).
11. High dose of mycophenolate mofetil (MMF) (> 2 g/day) and steroids increase the risk of lymphatic complications (9).
12. Lymphatic filariasis (11).
13. Acute rejection and mammalian target of rapamycin (mTOR) inhibitors (2).

Diagnosis
Ultrasound (U/S) can determine the collection as well as its dimensions, location in relation to the graft and possible effects on the graft vessels and ureter. Biochemical analysis of contained fluid allows differentiation from urinoma (6).

Complications
1. Pressure effect on the hilar vessels, transplanted ureter and recipient iliac vein can lead to allograft dysfunction and unilateral limb oedema (6).
2. Scrotal or vulval oedema and DVT of the iliac veins (8).
3. Wound dehiscence can lead to sepsis or lympho-cutaneous fistula (8).

Management
- Intra-operative drain placement (12).
- Percutaneous aspiration and sclerotherapy (5).
- Laparoscopic fenestration (13).
- Open surgery (14).

PATIENTS AND METHODS:
Study design, setting, data & collection time
This prospective comparative study was carried out in Kidney Transplant Center in Medical City; the data collection was completed during the period from 1st August 2017 till 1st August 2019.

Study patients and sample size
A total number of 100 patients divided into 84 male and 16 female of age ranging from 13-63 years, with end stage renal disease who underwent renal transplantation of living donors were enrolled in the study.

Exclusion criteria
Death, Graft loss within 4-6 weeks, Lack of follow-up

Surgical procedure
In the present study, the patients were equally divided into two groups with regards to surgical technique in lymphatic dissection; suture ligation group and monopolar cauterization group. Standard right or left Gibson incision was performed to the patients in both groups. The important features of our technique are as follows:

Dissection of iliac vessels: The external iliac vein and either common iliac, external or internal iliac artery were identified and strapped from lymphatic’s and lymph nodes. This tissue was lifted off the vessels and in ligation group, two 3/0 silk ligatures were passed and tied on both sides of the artery; while in cautery group the tissue was divided by monopolar cauterization.

Lymph nodes: obscuring the external iliac artery and the external iliac vein were also removed by ligating all tissue before dividing in ligation group; lymph nodes were cauterized in cautery group.

Allograft lymphatic’s present in the hilum and along its vessels were carefully ligated in ligation group or cauterized in cautery group to prevent leakage after perfusion.

Drains: At the end of the procedure, two tube drains were inserted in all patients, anteriorly and posteriorly to the allograft, and only removed when drainage is less than 50 mL or within 21 days, which come first.

Ultrasound (U/S): was performed on day 5 postoperatively. Following discharge, a follow up ultrasound was carried out in the clinic 4-6 months afterwards. It was also performed when indicated.

RESULTS:
The total number of study patients was 100. They were equally divided into two Ligation and cauter group.

General characteristics
Study patients’ age was ranging from 13 to 63 years with a mean of 38.63 years and a standard deviation (SD) of ± 15.9 years. The proportion of ligation group was aged between 20-39 years (46%) while (48%) of cautery group were aged between 40 – 59 years.

Regarding gender, proportion of males was higher than females in both groups (82% versus 18% in ligation group and 86% versus 14% in cautery group).
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About BMI level, 66% of ligation group and 78% of cautery group had normal BMI.

Clinical information
In this study, hypertension was the most common comorbidity that affects patients in ligation and cautery groups (84% and 78% respectively). Renal transplantation was done in the right side in 81% of ligation and cautery groups. Regarding anastomosis, it was done for internal iliac artery in the highest proportion of ligation and cautery groups (62% and 54% respectively).

Outcome of operation
Lymphocele formation was noticed in 20% of patients who were managed by lymphatic electro cauterization which was significantly higher than that in patients who were managed by meticulous ligation of lymphatics (6%) (P= 0.037). Regarding duration until drain removal, it was ranging from 3 – 6 days in ligation group and from 5 – 21 days in cautery group and the mean of duration until drain removal was significantly higher in cautery group than that in ligation group (7.1 versus 5.8 days, P= 0.02).

Table 1: Distribution of study groups by certain clinical information.

<table>
<thead>
<tr>
<th>Clinical information</th>
<th>Ligation (%)</th>
<th>Cautery (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comorbidity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>42 (84.0)</td>
<td>39 (78.0)</td>
<td>81 (81.0)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>15 (30.0)</td>
<td>11 (22.0)</td>
<td>26 (26.0)</td>
</tr>
<tr>
<td>Idiopathic</td>
<td>8 (16.0)</td>
<td>12 (24.0)</td>
<td>20 (20.0)</td>
</tr>
<tr>
<td>Stone disease</td>
<td>4 (8.0)</td>
<td>3 (6.0)</td>
<td>7 (7.0)</td>
</tr>
<tr>
<td>Reflux nephropathy</td>
<td>2 (4.0)</td>
<td>4 (8.0)</td>
<td>6 (6.0)</td>
</tr>
<tr>
<td>Glomerulonephritis</td>
<td>2 (4.0)</td>
<td>3 (6.0)</td>
<td>5 (5.0)</td>
</tr>
<tr>
<td>Polycystic kidney disease</td>
<td>0 (0)</td>
<td>2 (4.0)</td>
<td>2 (2.0)</td>
</tr>
<tr>
<td>Side of transplantation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>39 (78.0)</td>
<td>42 (84.0)</td>
<td>81 (81.0)</td>
</tr>
<tr>
<td>Left</td>
<td>11 (22.0)</td>
<td>8 (16.0)</td>
<td>19 (19.0)</td>
</tr>
<tr>
<td>Anastomosis done</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal iliac artery</td>
<td>31 (62.0)</td>
<td>27 (54.0)</td>
<td>58 (58.0)</td>
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<tr>
<td>External iliac artery</td>
<td>18 (36.0)</td>
<td>21 (42.0)</td>
<td>39 (39.0)</td>
</tr>
<tr>
<td>Common iliac artery</td>
<td>1 (2.0)</td>
<td>2 (4.0)</td>
<td>3 (3.0)</td>
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<tr>
<td>Number of transplants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>48 (96.0)</td>
<td>47 (94.0)</td>
<td>95 (95.0)</td>
</tr>
<tr>
<td>Second</td>
<td>2 (4.0)</td>
<td>3 (6.0)</td>
<td>5 (5.0)</td>
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</tbody>
</table>

Table 2: Comparison between study groups by lymphocele formation

<table>
<thead>
<tr>
<th>Lymphocele</th>
<th>Study Group</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ligation (%)</td>
<td>Cautery (%)</td>
</tr>
<tr>
<td>Yes</td>
<td>3 (6.0)</td>
<td>10 (20.0)</td>
</tr>
<tr>
<td>No</td>
<td>47 (94.0)</td>
<td>40 (80.0)</td>
</tr>
</tbody>
</table>

Table 3: Comparison between study groups by outcome of operation.

<table>
<thead>
<tr>
<th>Duration until drain removal (days)</th>
<th>Study Group</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ligation Mean ± SD</td>
<td>Cautery Mean ± SD</td>
</tr>
<tr>
<td></td>
<td>5.8 ± 2.3</td>
<td>7.1 ± 3.1</td>
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</table>

Table 4: Comparison between study groups by intervention needed.

<table>
<thead>
<tr>
<th>Intervention needed</th>
<th>Study Group</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2 (20.0)</td>
<td>8 (80.0)</td>
</tr>
<tr>
<td>No</td>
<td>48 (53.3)</td>
<td>42 (46.7)</td>
</tr>
</tbody>
</table>
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DISCUSSION:
Lymphocele formation was lower in patients who were managed by meticulous ligation of lymphatics.

REFERENCES:
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