

EARLY REMOVAL OF POST-OPERATIVE ABDOMINAL DRAIN AFTER RENAL TRANSPLANT IN PATIENTS WITH SIGNIFICANT LYMPHORRHOEA: RESULTS OF A SINGLE CENTRE OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND

Delay in post-operative abdominal drain removal due to excessive lymphorrhoea can lead to prolonged hospital stay and increase in risk of infections in patients with kidney transplant. This study was designed to evaluate outcomes and cost effectiveness of early drain removal in renal transplant recipients with significant lymphorrhoea.

MATERIALS AND METHODS

In this retrospective observational study, kidney transplant recipients in whom abdominal drain was removed despite lymphorrhoea output of more than 200 ml/ day for five consecutive post-operative days were included in the 'early drain removal group' (EDR). Five patients who had a drain output of more than 200 ml/day for five consecutive post-operative days but who had the drain removed as per traditional practice i.e. after output went below 50 ml were included in the 'late drain removal group' (LDR). The patients were observed closely for any wound complications or development of lymphocoele. Patients were followed with ultrasound scans at four weeks, three months and six months. Incidence of perinephric collection or lymphocoele was recorded.

RESULTS

A total of ten patients (9 males) were included in the study (EDR group n=5; mean (\pm SD) age 44.8 (\pm 5.50) years; LDR group n=5; mean (\pm SD) age 41.4 (\pm 8.41) years). Comorbidities in both groups were similar. Induction was used in four patients in the EDR group and all patients in the LDR group. The maintenance immunosuppressive therapy used in all patients was similar. The difference in drain output till five days was not significant between two groups (day 1- p=0.757, day 2- p=1; day 3- p=0.860; day 4-p=0.436; day 5-p=0.553). There were no post-operative complications or post-drain removal wound complication in any of the patients in both the groups. Mean (\pm SD) duration of hospital stay in EDR group and LDR group was 8.2 (\pm 0.45) and 12.8 (\pm 1.30) days respectively (p=0.001). Early removal of drain was associated with reduction in the overall cost of therapy.

CONCLUSION

Early removal of drain may be a satisfactory, cost-effective and feasible option in kidney transplant recipients. A larger, prospective study is desired.

KEYWORDS

Early drain removal, renal transplant, cost-effectiveness.

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BACKGROUND

Lymphocoele and lymphorrhoea are known lymphatic complications in patients undergoing renal transplantation.¹⁻¹⁰ Leakage of lymphatic fluid from the surgical drain or from the abdominal wall through surgical wound is termed as lymphorrhoea.² Lymphocoele is a lymphatic collection around a transplanted kidney. It can occur from two weeks to six months after kidney transplantation. The incidence of lymphocoele in transplant recipients ranges from 12 to

40%.¹¹ Surgical causes (e.g. damage to the lymphatics of recipient or transplanted kidney),^{2,12} medical factors (e.g. diabetes, obesity, coagulation related abnormalities) and immune-suppressive agents are known to be associated with risk of development of lymphocoele or lymphorrhea.² It is important to avoid development of lymphatic complications or treat them early, because of their association with infection episodes and impairment of graft function in renal transplant recipients.^{2,13}

Bipolar cautery of lymphatic vessels can prevent lymphocoele formation in kidney transplant.¹⁴ Placing a surgical drain in the extraperitoneal space can also reduce the risk of fluid collection after transplantation. This is a commonly practiced measure in many settings. A surgical drain placed in the extraperitoneal space during surgery is removed after volume of drainage is less than 50 ml for two consecutive days. This usually takes about five to six days after transplantation.² Patients in whom the drain output continues to be large retain their drain for longer period. Our routine practice also was to keep the indwelling drain until the drainage output decreased to less than 50 ml/day.

Management options for lymphocoele include aspiration, surgical manipulation, and use of sclerotherapy.⁶ Povidone- iodine can be used as a sclerosing agent to reduce the lymphorrhoea.¹⁵ In the past, we also attempted use of povidone-iodine; however, the results were not satisfactory.

In pancreatic head resection, drain removal on fourth postoperative day has been shown to reduce the incidence of complications, including intra-abdominal infections.¹⁶

Early removal of abdominal drain may reduce the risk of infection into the collection and prevent possibility of multiloculated lymphocoele thereby avoid complexity of treatment and reduce post-operative morbidity. There is limited evidence on outcomes of early post-operative removal of drain in renal transplant recipients.

Objective

The objective of this study was to evaluate outcomes and cost effectiveness of early drain removal in renal transplant recipients with significant lymphorrhoea.

MATERIALS AND METHODS

In this retrospective observational study, we included ten kidney transplant recipients over last two years in whom abdominal drain was more than 200 ml/ day for five consecutive post-operative days. Kidney transplant recipients whose transplant was performed more than two years ago or less than three months ago and those with abdominal drain of less than 200 ml/day in initial five post-

operative days were excluded. Five patients had their abdominal drain removed despite output of more than 200 ml/ day for five consecutive post-operative days. These were included in the 'early drain removal group' (EDR). Five patients who had a drain output of more than 200 ml/day for five consecutive post-operative days but who had the drain removed as per the regular practice i.e. after output went below 50 ml were included in the 'late drain removal group' (LDR).

In all study participants, the output was confirmed to be lymph and one patient with urine leak was excluded. The patients were observed closely for any wound complications or development of lymphocoele.

Patients in the EDR group were followed with ultrasound scans at one month and three months whereas those in the LDR group underwent sonography after three months. Incidence of peri-nephric collection or lymphocoele was recorded. Occurrence of any peri nephric collection or lymphocoele was compared between two groups Cost of extra days stay in the hospital was studied.

Statistical Analysis

Continuous data are presented as mean and standard deviation. Unpaired t test was used to compare means between two groups. P value of less than 0.05 was considered statistically significant.

RESULTS

A total of ten patients were included in the study. EDR group and LDRs group consisted of five patients each. Baseline characteristics of patients are shown in table 1. The study was dominated by male population. Out of ten patients, nine were male and only one female. Age group of patients ranged from 37 to 55 years. The patients in EDR group were from 37 to 52 years of age where as in the LDR group range of age was 33 to 55 years. The mean (\pm SD) age of patients in EDR group was 44.8 (\pm 5.50) years whereas those in LDR group was 41.4 (\pm 8.41) years.

Comorbidities in both groups were similar. Hypertension was present in all patients whereas diabetes was present in one patient each in both groups. Chronic glomerulonephritis was responsible for renal failure in three patients in both groups.

Thymoglobulin induction was used in four patients in the EDR group and all patients in the LDR group. One patient in EDR group did not receive induction therapy. The maintenance therapy used in all patients in the EDR group as well as LDR group was tacrolimus, mycophenolate mofetil and corticosteroid.

	EDR group					LDR group				
	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Age	37	52	45	43	47	33	39	37	43	55
Sex	M	M	M	F	M	M	M	M	M	M
Baseline Kidney Disease	MPGN	CGN	CTID	CGN	CGN	IgA Nephropathy	CGN	CGN	CGN	Diabetic Nephropathy

Comorbidities										
Diabetes	No	Yes	No	No	No	No	No	No	No	Yes
Hypertension	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Drain Removal Day	5 th	5 th	5 th	5 th	5 th	10 th	10 th	13 th	11 th	9 th

Table 1. Base Characteristics of Study Population

MPGN: Membrano-Proliferative Glomerulo-Nephritis, CGN: Chronic Glomerulonephritis, CTID: Chronic Tubulo-Interstitial Disease

The mean (\pm SD) drain output in EDR group on day 1, 2, 3, 4 and 5 was 365 (\pm 249.7), 380 (\pm 115.1), 284 (\pm 50.3), 211 (\pm 30.5), 202 (\pm 4.5) respectively. The corresponding drain output in LDR group was 316 (\pm 233.5), 380 (\pm 120.4), 275 (\pm 97.2), 300 (\pm 229.1) and 258 (\pm 193.6) respectively (figure 1). The difference in drain output was not significant on any day (day 1- $p=0.757$, day 2- $p=1$; day 3- $p=0.860$; day 4- $p=0.436$; day 5- $p=0.553$).

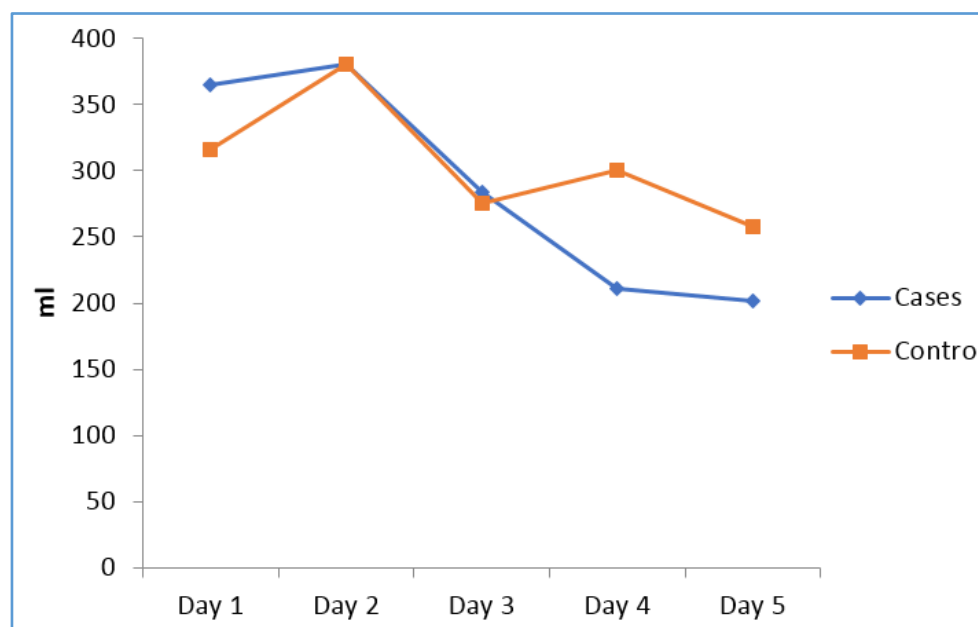


Figure 1. Mean Drain Output in Cases and Control Groups Until Day Five

There was no post-operative complication or post-drain removal wound complication in any of the patients in both groups (table 2).

One patient in whom drain was removed on day five, ultrasound at one month showed presence of small collection at lower pole of kidney. However, ultrasound at three months did not show collection of fluid. In other patients, sonography results were normal in all at one and three months. Ultrasound performed at three months in the LDR group did not show collection of fluid in any patient.

	Cases Group					Control Group				
	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Drain Output										
Day 6	3G+	3G+	2G+	3G+	4G+	150	150	200	150	270
Day 7	2G+	1G+	1G+	1G+	2G+	150	120	235	100	220
Day 8	Nil	Nil	Nil	Nil	Nil	150	120	300	200	300
Day 9	NA	NA	NA	NA	NA	100	50	200	200	170
Day 10	NA	NA	NA	NA	NA	60	20	150	150	110
Any Post-operative Complications	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Post-drain Removal Wound Complication	No	No	No	No	No	No	No	No	No	No

Post-drain Removal Follow up Ultrasound										
One Month	No Perinephric Collection	Small Collection at Lower Pole	No Perinephric Collection	No Perinephric Collection	No Perinephric Collection	NA	NA	NA	NA	NA
Three Months	No Perinephric Collection	No Collection	No Perinephric Collection	No Perinephric Collection	No Perinephric Collection	No Collection	No Collection	No Collection	No Collection	No Collection

Table 2. Outcomes of Early Drain Removal Versus Regular Practice

G+ No. of gauze soaked with fluid.

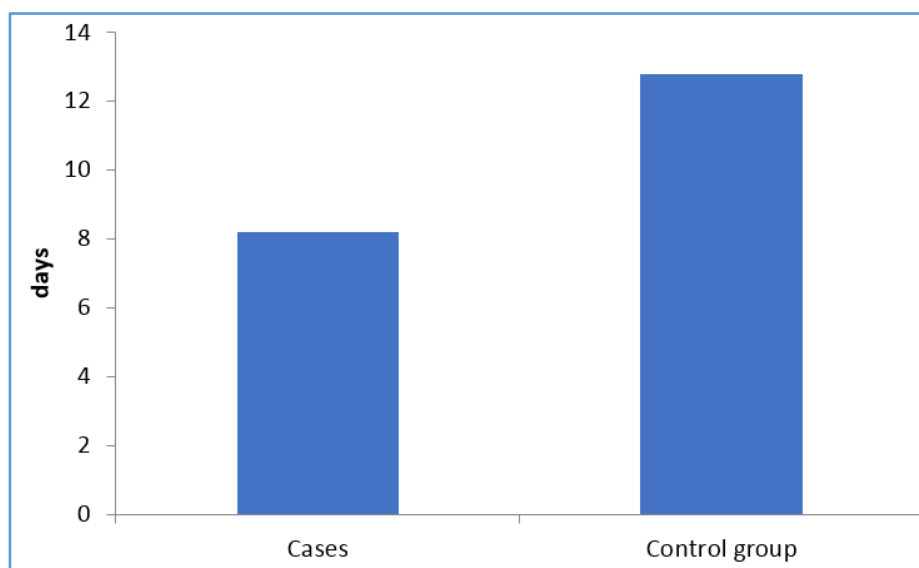


Figure 2. Mean (±SD) Duration of Hospital Stay in Cases and Control Group

Mean (±SD) duration of hospital stay in EDR group was 8.2 (±0.45) days whereas in the LDR group it was 12.8 (±1.30) days (figure 2). The difference in duration was hospital was statistically significant ($p=0.001$).

Reduction in hospital stay in the EDR group resulted in savings of approximately Rs. 5000/- rupees per day of kidney transplant recovery room cost. 40 percent of the patients in this centre come from outside of Mumbai and they are accompanied by two relatives. The cost of their lodging and boarding gets added to the total cost.

DISCUSSION

Lymphocoele, one of the common complications after kidney transplantation, can be the cause of impaired graft functioning.¹⁷ Other morbidities associated with lymphocoele include pain, graft loss, rehospitalisation and need for repeat surgery. Considering these complications prevention of lymphocoele formation is critical.¹⁸ Peritoneal fenestration can help to decrease the risk of lymphocoele formation.^{10,18}

Prevention of lymphocoele by putting retroperitoneal drain is a common practice in patients with renal transplantation. However, increased duration of drainage can result in increased utilization of hospital resources¹⁹ or cause an increased expenditure to the patient. In this study, we compared outcomes of early removal of post-operative drain in patients having persistent lymphorrhoea post renal

transplant with those in whom drain was removed as per regular practice.

Patients with early removal of drain showed satisfactory clinical outcomes. No post-operative complication or post drain removal wound complication was observed in any patient in both groups.

Diffusion of lymphatic fluid increases the risk of infections²⁰ and wound infection is associated with prolonged wound drainage.¹⁹ Early removal of prophylactic drain has shown to be feasible and safe in pancreatic head surgery¹⁶ and liver surgery.²¹ In patients with pancreatic head resection, early removal of prophylactic drain has shown to decrease the risk of intra-abdominal infections.¹⁶ There are limited studies showing outcomes of early removal of drain in patients undergoing renal transplantation. In the current study, there was no incidence of infection in any of the patients.

Diffusion of lymphatic fluid also increases duration of hospital stay.²⁰ In a study, prolonged wound drainage increased 8.7 days stay during first hospitalization.¹⁹ In our study too early removal of surgical drain was associated with 4.6 days of lesser stay in hospital. We also evaluated effect of early drain removal on cost saving for the patient. The cost reduction was because of

decrease in the duration of hospital stay and shorter antibiotic course. Other ancillary costs like travel costs, lodging and boarding and loss of productivity of accompanying relatives during hospital stay of the patient was not calculated. If this cost is added, early removal of drain results in considerable savings for the patient.

Overall, results suggest that early abdominal drain removal is a feasible option in kidney transplant recipients. In the cases described in this study, there was no significant cutaneous lymphorrhagia during treatment and the patients were discharged early. Follow-up of these patients did not show any peri-nephric collection or lymphocoele.

Removing the drain early during lymphorrhoea in renal transplant recipient is a rational option. Moreover, if at all a lymphocoele occurs, the chances of it being infected or multi-loculated will be minimal, thereby simplifying treatment options.

The current study is associated with some limitations. Sample size of the study was small. The retrospective study design and single centre data are some of the other limitations of our study. Larger studies are required for confirmation of our observations.

CONCLUSION

Early removal of drain may be a satisfactory and feasible option in kidney transplant recipients. It also reduces hospital stay and economic burden on the patient. Further large, multi-centric studies are required for wide spread practice of early drain removal in renal transplant recipients.

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