

The outcome of bladder cycling prior to renal transplantation in patients with defunctionalized bladder

PROTOCOL OF A THESIS FOR PARTIAL FULFILLMENT OF DOCTORATE
DEGREE IN UROLOGY

BY

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**1-What is already known on this subject? AND
What does this study add?**

Kidney transplantation still remains the best treatment for end-stage renal disease (ESRD). Indeed, increasing numbers of patients are referred for transplantation, but there has been no concomitant increase in the supply of kidneys from the traditional donor pool. Many potential recipients awaiting transplantation, therefore must undergo dialysis for a long time. Regarding the detrimental effect of long-term dialysis associated with oliguria or anuria on the lower urinary tract, and especially in bladder, the interruption of physiological cycle of storage and voiding brings to a situation called Defunctionalized Bladder (DB) in which the bladder capacity became smaller in size. (**Errando et al 2018**).

In this study we will evaluate the outcome of renal transplantation into a defunctionalized bladder by pre-transplant programmed bladder cycling.

2.AIM / OBJECTIVES

The aim of this study is to evaluate the anatomical and physiological benefit of programmed bladder cycling prior to renal transplantation in patients with defunctionalized urinary bladder.

3. INTRODUCTION/ REVIEW

Despite medicine has been experiencing several and constant improvements in these years, kidney transplantation (KT) still remains the best treatment for end-stage renal disease (ESRD). In the recent years, we're witnessing a constant growth of the patients' waiting-list for renal transplant, due either to the lack of kidney donors and to the rise in ESRD incidence and prevalence. (**Aytekin et al 2020**)

Some patients are able to benefit from a related living organ donor and pre-emptive or early KT, but most will need renal replacement therapy (haemodialysis or peritoneal dialysis) for a long time. The natural consequence of this situation is that patients affected from ESRD have to stay in dialysis for longer periods, thus often developing oliguria or anuria. (**Bendorf et al 2013**)

The amount of diuresis in ESRD patients differs significantly; from volumes that can be defined as "normal" to "zero" mL (diuresis of 1500 mL or more/day can be considered normal). As a result, many patients will not regularly use their lower urinary tract (LUT) during the transplant waiting period which in some cases may be long. Indeed, this inactivity of the LUT brings over time to a condition of small bladder, with even less of 100 mL of maximum bladder capacity, due to atrophy and fibrosis. (**Girerd et al 2018**)

Current evidences show that preemptive renal transplant, or after a limited dialysis period, provide better graft survival rate, lesser complication rates and reduce metabolic impairment when

compared to those who experienced long-term dialysis, especially in children. A period greater than 6 months of dialysis is associated with worst outcomes. (**Neves et al 2018**).

Regarding the detrimental effect of long-term dialysis on the LUT, and especially in bladder, the interruption of physiological cycle of storage and voiding brings to a situation called **Defunctionalized Bladder (DB)**. A standard definition of DB does not exist, however a common definition used by Errando et al., identify a DB when bladder output is less than 300 mL/24 h. Other definitions exist, however they differs greatly and due to their heterogeneity a general consensus on DB still lacks. (**Errando et al 2018**).

4. METHODOLOGY:

Patients and Methods/ Subjects and Methods/ Material and Methods

Type of study: prospective cohort study.

Study setting: department of urology, Faculty of medicine, Ain shams university hospitals.

Study period: 18 months

Study population: Egyptian patients attending Ain Shams University hospitals who are prepared for renal transplantation.

Inclusion criteria:

1-Age: 16 years and older.

2-ESRD patients maintained on hemodialysis for more than 12 months.

3-Have oliguria or anuria

4-reduced bladder capacity (less than 100 ml) assessed by cystogram.

Exclusion criteria:

- 1- Previous bladder or pelvic surgery or procedure having affected the bladder function.
- 2- Neurogenic bladder dysfunction.
- 3-Patients with history of lower urinary tract symptoms before developing renal failure.
- 4-Those with lower urinary tract disease resulting in renal failure.

Sampling method: prospective cohort study.

Sample size: the study main objective is to describe various parameters related to bladder functionality in renal transplanted cases with defunctionalized bladder when treated with pre-transplant bladder cycling and due to limited data available, estimation of sample size will be based on effect size. A sample size of at least **20 cases** achieves a power of 80% to detect a large effect size of 0.7 comparing pre- and post- cystometric capacity using paired t-test with level of significance of 0.05.

Ethical Considerations:

The study will be presented for approval from the ethical committee of the Faculty of medicine, Ain shams university.

- Informed written consent will be taken before recruitment in the study after explaining the purpose and procedures of the study.
- The privacy of participants and confidentiality of data will be guaranteed during the various phases of the study.
- Any participant does not have to take part in this research if he or she wanted, they may stop participating at any time.

Study procedures:**Preoperative evaluation:**

- 1-History including medical history, surgical history, drug history and history of a voiding diary that documents urinary continence, voided volumes and times of voiding.
- 2-Detailed physical examination with special attention to abdominal scars, stomas and catheter.
- 3- Laboratory investigations:

Urine analysis, urine culture (mid-stream) and sensitivity, blood urea, creatinine levels, complete blood counts, liver function tests (ALT, AST) and coagulation profile.

4) Radiological investigations:

As pelvi-abdominal ultrasound and ascending cystogram in order to confirm the diagnosis of reduced bladder capacity.

5) Cystometry.

-Bladder recycling will be done by the patient after proper education. It will be started by the instillation of the sterile water in the bladder in amount equal to the estimated bladder capacity. Then the amount will be gradually increased till the patient can withstand filling the bladder with 250 cc of sterile saline for 2 hours. Any associated complications will be reported and the time needed to reach the due bladder capacity will be recorded.

-Ascending cystogram will be done after bladder recycling.

Intraoperative: The procedure of renal transplantation will be carried out according to the hospital protocol and the ureteroneocystostomy will be done by a stented Leich Gregoir technique.

Postoperative evaluation:

Assuming that the bladder will regain its activity and full capacity after 8 weeks of transplantation, all patients will be assessed 3 months after transplantation by the following:

1. IPSS questionnaire in order to evaluate the lower urinary tract symptoms.
2. Ascending cystogram.
3. Pelvi-abdominal ultrasound with pre and post voiding residual urine assessment.
4. Renal graft function.

And after 6 months of transplantation by:

- 1- IPSS questionnaire.
- 2- Pre and post voiding pelvi-abdominal ultrasound.

Statistical Analysis Method

Data will be collected, tabulated and will be subjected to adequate statistical analysis including mean and standard deviations and will be discussed.

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- 4) Patients and methods.
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5. REFERENCES

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