



# Long-Term Renal Function Outcomes after Radical Cystectomy with Orthotopic Neobladder in Patients with Chronic Kidney Disease

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# Disclosures

- None

# Introduction

- Orthotopic neobladder (ONB) reconstruction is discouraged in patients with chronic kidney disease (CKD)<sup>1</sup>:
  - May cause electrolyte disturbances and worsening renal function in the long run
- Traditionally, glomerular filtration rate (GFR) > 60 ml/min is recommended for patients receiving ONB<sup>2</sup>.
- Risk of renal function decline is not significantly different following incontinent versus continent diversion in patient with preoperative stage IIIa CKD<sup>3</sup>.

<sup>1</sup>Daneshmand et al., *Curr Opin Urol*, 2015

<sup>2</sup>Lee et al., *BJU Int*, 2014

<sup>3</sup>Eisenberg et al., *J Urol*, 2014

# Objectives

- To evaluate long-term renal function outcomes of bladder cancer patients with CKD stage IIIa (GFR between 45-60 ml/min) who underwent radical cystectomy and ONB formation
- To identify predictors of decline in GFR overtime

# Methods

- IRB approved, prospectively maintained bladder cancer database
- 2182 patients with bladder cancer who underwent RC with intent to cure from January 2003 to December 2018:
  - 1280/2182 (59%) received ONB
  - 273/1280 (21%) ONB patients had  $45 < \text{GFR} < 60$  ml/min
- Patients without long term follow-up creatinine were excluded.

# Methods

- Postoperative creatinine :
  - 1.5, 3, 6, 9 and 12 months within the first year
  - Every six months afterwards
- Baseline and follow-up GFRs calculated using MDRD formula
- Significant GFR drop: A decrease in GFR > 10 units
- For patients with preoperative hydronephrosis who underwent stent/nephrostomy tube placement, nadir creatinine was used to calculate baseline GFR

# Methods

- Clinical and demographic information
  - Age/gender
  - Body Mass Index (BMI)
  - Baseline diabetes and hypertension
  - Charlson comorbidity index
  - Pathologic stage
  - Neoadjuvant/Adjuvant chemotherapy
  - Post-operative complications
- Multivariate analysis to detect predictors of significant GFR drop controlling for :
  - Age
  - Past medical history
  - Post-operative complications
  - Perioperative chemotherapy

# Demographics

- 257 patients
- Median Pre-op GFR: 53.6 ml/min (IQR: 49.9 – 56.6)
- Pre-op hydronephrosis: 69 (26.8%)
- Pre-op stent/nephrostomy tube: 36 (14%)
- Median follow-up: 2 years (IQR: 7 months - 5 years)

Age (median)		70
BMI (median)		27
Hypertension		97 (38%)
Diabetes		44 (17%)
Sex	Male	226 (88%)
	Female	31 (12%)
Neoadjuvant Chemotherapy		74 (28.7%)
Adjuvant Chemotherapy		20 (7.8 %)
Pathologic Stage	Organ Confined	174 (67%)
	Extra-Vesical	39 (15%)
	Node Positive	44 (17%)



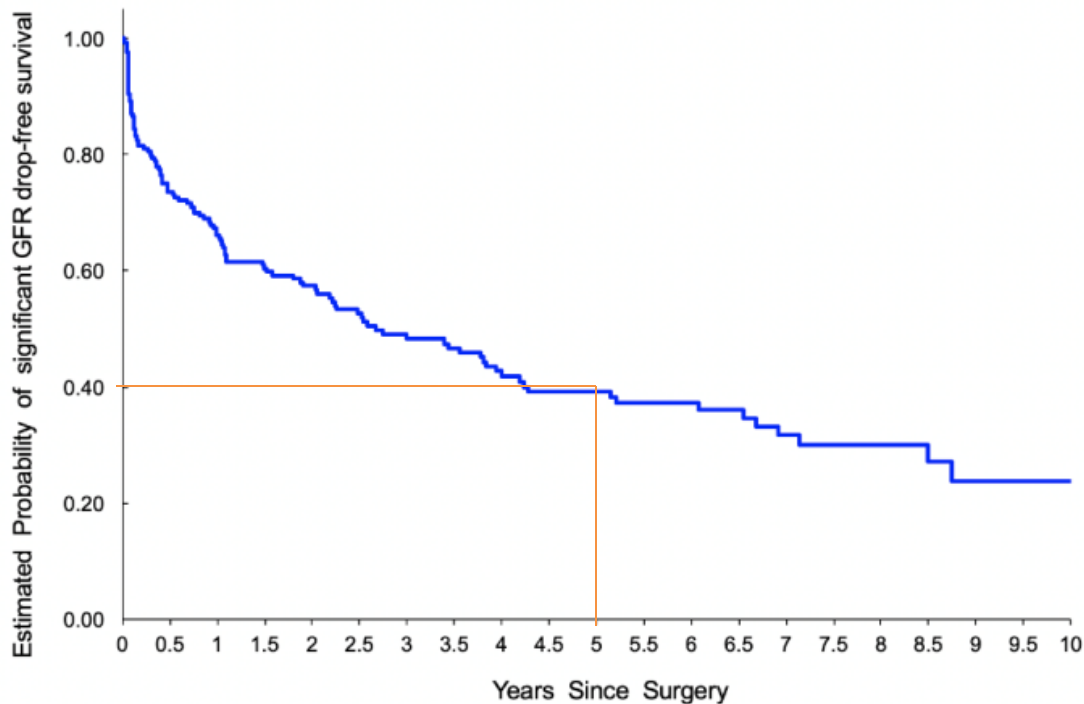
# Post-operative Complications

30-day Complications	Minor	82 (32%)
	Major	23 (9%)
90-day Complications	Minor	88 (34%)
	Major	42 (16%)
Important complications	Infection	59 (23%)
	Reflux	5 (2%)
	Stricture	22 (8.5%)
	Hydronephrosis	46 (18%)

# Results

- The median time to significant GFR drop was 1 year (IQR: 2 months – 3.5 years).
- After 2.5 years, 132 (51.3%) patients did not have any significant GFR drop .
- GFR remained above 45 in 125 (49%) patients.

# Kaplan- Meier curve for significant GFR drop-free survival



# Predictors of significant GFR drop on multivariate analysis

Predictors	HR	95% CI	P value
Age	1.3	1.3 - 5	0.006
Neoadjuvant Chemotherapy	1.83	1.2 - 2.7	0.002
Diabetes	1.6	1 - 2.6	0.02
30-day Complications	1.47	1 - 2.1	0.04

# Discussion

- Change in GFR following either conduit or continent diversions was not statistically different in patients with preexisting renal insufficiency at short-term <sup>1</sup>.
- Better long-term renal function after orthotopic ileal bladder substitution than ileal conduit diversion in patients with predisposing risk factors for CKD <sup>2</sup>.
- 5 years postoperatively, the risk of >10 ml/min decrease in GFR was 57% <sup>3</sup>.
- Postoperative renal complications, urinary tract infection, age, hypertension and diabetes represent potential factors associated with decreased renal function <sup>3</sup>.

<sup>1</sup>Winters et al., *UroToday Int*, 2013

<sup>2</sup>Jin et al., *Euro Urol*, 2012

<sup>3</sup>Eisenberg et al., *J Urol*, 2014

# Strengths

- Long-term follow-up
- Large sample size
- Focusing on ONB
- Evaluating risk factors and predictors

# Limitations

- Retrospective, Single institution
- Lack of a control group
- Definition of GFR drop is arbitrary and there is no standard definition
- Creatinine clearance is not the most accurate estimate of renal function
- Missing unknown confounding factors causing renal function deterioration

# Conclusions

- A considerable proportion of patients with CKD stage IIIa and ONB does not have a significant GFR drop overtime.
- Baseline GFR does not affect their long term renal function outcome.



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