



MP5-10 EVALUATION OF RENAL FUNCTION OUTCOMES AND STENT DURABILITY IN PATIENTS WHO HAVE UNDERGONE RESONANCE STENT PLACEMENT FOR BENIGN URETERAL OBSTRUCTION



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INTRODUCTION

The metallic Resonance stent® (RS) is most commonly placed in patients for relief of chronic obstruction due to malignancy; however, these stents at times are placed in patients with chronic benign obstruction. Ideally, according to the manufacturer's specifications, RS can be maintained for a year with subsequent annual replacement. In this study, we evaluate the long-term performance of the RS among patients with a benign ureteral obstruction.

METHODS

- We performed a retrospective database review of patients with benign disease undergoing RS placement between 2010 and 2020.
- The impact of chronic RS placement on renal function was evaluated by comparing preplacement to long-term laboratory values and imaging after placement: serum creatinine, estimated glomerular filtration rates (eGFR), Lasix renal scans, and CT-based renal parenchymal volume measurements (3D Slicer).
- The number of RS exchanges, incidence of encrustation, and the average indwell time were recorded.

Table 1. Renal Function Outcomes after Resonance Stent Placement

Parameter	Preoperative, mean ± SD	Postoperative, mean ± SD	Change, mean ± SD	Change (%), mean ± SD	p-value
Serum Creatinine (mg/dL)	1.3 ± 0.7	1.3 ± 0.7	0.03 ± 0.5	-2.3 ± 30.8	0.68
eGFR (mL/min per 1.73m ²)	60.4 ± 25.8	60.3 ± 25.0	-0.2 ± 17.8	-6.2 ± 35.5	0.99
Split Function (%) – Right	48.8 ± 24.8	54.3 ± 27.0	-8.1 ± 20.3	-31.2 ± 91.2	0.18
Split Function (%) - Left	49.1 ± 24.3	45.7 ± 27.0	4.0 ± 14.6	5.5 ± 34.1	0.34
Renal Volume (cm ³)	134.1 ± 61.0	127.4 ± 71.4	6.6 ± 38.2	7.1 ± 30.8	0.44

Table 2. Perioperative Outcomes

Postoperative Outcomes	n=43
Follow-up (months), mean ± SD	25.8 ± 24.9
Postoperative Chronic Kidney Disease (CKD), no. (%)	
1	5 (12)
2	13 (30)
3a	13 (30)
3b	9 (21)
4	2 (5)
5	1 (2)
Number of Resonance Stent Replacements During Follow-up, mean ± SD	1.1 ± 1.4
Duration of Indwelling Stent (months), mean ± SD	9.7 ± 6.2
Stents Encrusted, no. (%)	
Unspecified	15 (35)
No	19 (44)
Yes	9 (21)
Removal Method for Encrusted Stents (n=9), number (%) / mean indwell time (months)	
Unspecified	1 (11)/6.6
Graspers Only	4 (44)/10.2
Graspers + Laser Use	4 (44)/16.1
Use of Uroci-K During Follow-up Period in Patients with Encrustation (n=9), number (%)	
Yes	2 (22)
No	7 (78)
Initial Stent Removed with No Future Exchanges, no. (%)	
Before 6 months	4 (57)
After 6 months	3 (43)
Stent Replaced/Removed Within 6 months of Placement Due to Stent Failure, no. (%)	
Removed	5 (45)
Replaced	6 (55)
Long-term Follow-up Outcomes in Patients with Stent Replacement/Removal Within 6 months of Placement Due to Stent Failure, no. (%)	
Ongoing Resonance Stent Exchanges	1 (9)
Surgical Intervention (i.e., nephrectomy, reconstruction, diversion)	4 (36)
Placement of Nephrostomy Tube	4 (36)
Salvage With Placement of Double J-stents	1 (9)
Deceased Prior to Exchange/Removal	1 (9)

RESULTS

- 43 patients with benign obstruction and RS were identified.
- At a mean follow-up of 26 months (range 3-134), there were no changes in eGFR ($p = 0.99$) or parenchymal volume ($p = 0.44$) in the stent-bearing kidney. Split renal function (Right $p = 0.18$, Left $p = 0.34$) was no different as well.
- RS had a mean stent indwell time of 9.7 months (range of 3-33 months).
- Eleven patients (26%) underwent stent replacement or removal prematurely (i.e., within 6 months of placement) due to various causes (i.e., obstruction, stent colic, definitive surgery).
- Nine stents (21%) were encrusted at time of replacement or removal after a mean indwell time of 12.5 months (range 5-23), of which 4 (44%) required laser lithotripsy with a mean indwell time of 16.1 months (range 11-23).
- 25 patients (58%) had an average stent indwell time of ≥ 6 months and 12 patients (28%) had an average stent indwell time of ≥ 12 months.

CONCLUSIONS

- Resonance stent deployment for **benign** ureteral obstruction preserves renal function and parenchymal volume at a mean follow-up of 2 years.
- Only 28% of patients fulfilled the one-year criterion for stent duration.
- To avoid significant encrustation, we recommend stent exchange at 1 year.