



Artificial Urinary Sphincter Device Survival and Quality of Life Outcomes in 1,154 Patients

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Background

Artificial urinary sphincter (AUS) placement is the standard for treatment of severe male stress urinary incontinence (SUI). While there is evidence to suggest satisfactory device survival, there is a paucity of data addressing long-term quality of life outcomes.

Objective

To determine long-term device survival outcomes and key quality of life metrics in a large cohort of primary AUS patients.

Methods

- Retrospective single-center review, 1983-2016
- 2,298 AUS procedures; 1,154 primary AUS placements included in this study
- Median follow-up 5.4 years (IQR 1.6-10.5 yr)
- Tabulated need for any secondary surgery and breakdown by:
 - Infection/Erosion
 - Urethral atrophy
 - Malfunction
 - Other (pump, tubing issue)
- Device secondary surgery free survival assessed by Kaplan-Meier analysis
- Univariate and multivariable analysis performed for factors associated with secondary surgery
- Quality of life assessed by pad usage per day and survey response of the Patient Global Impression of Improvement (PGI-I)¹, also stratified based on duration of follow-up

Table 1: Patient Characteristics

Age (y), median (IQR)	70 (65,75)
Etiology of incontinence	
RP only	703 (61%)
RP+RT	312 (27%)
TURP	112 (10%)
Cryo	27 (2%)
BMI (kg/m ²), median (IQR) (n = 826)	28 (26, 31)
Brachytherapy	17 (2%)
Coronary Artery Disease (n = 756)	200 (27%)
Hypertension (n = 751)	471 (63%)
Diabetes Mellitus (n = 753)	121 (16%)
Peripheral Vascular Disease (n = 751)	38 (5%)
Tobacco use (n = 722)	
Never	327 (45%)
Former	350 (49%)
Current	45 (6%)
Androgen Deprivation Therapy (n = 737)	115 (16%)
History of bladder neck contracture (n = 744)	214 (29%)
Prior urethral sling (n = 1144)	40 (4%)
Prior urethral bulking agent injection (n= 1143)	143 (13%)

Table 2: Secondary Surgery

Cause	N (%)	Time, yr, median (IQR)
All	404	3.7 (1.0, 6.8)
Infection / Erosion	99 (25%)	1.3 (0.3, 4.8)
Malfunction	156 (39%)	4.5 (2.2, 8.0)
Atrophy	105 (26%)	4.4 (1.9, 7.8)
Pump / Tubing	44 (11%)	0.2 (0.1, 0.2)

Table 3: Multivariable Analysis for Secondary Surgery

Variable	HR	95% CI	p value
Age at AUS surgery	1.0	0.99, 1.03	0.35
Coronary Artery Disease	1.0	0.73, 1.31	0.88
Diabetes Mellitus	1.1	0.79, 1.55	0.57
Etiology of incontinence			
Cryo vs RP only	2.4	1.33, 4.16	<0.01
RP+RT vs RP only	1.2	0.94, 1.60	0.13
TURP vs RP only	1.4	0.79, 2.40	0.27

Figure 1: Secondary Surgery Free Survival

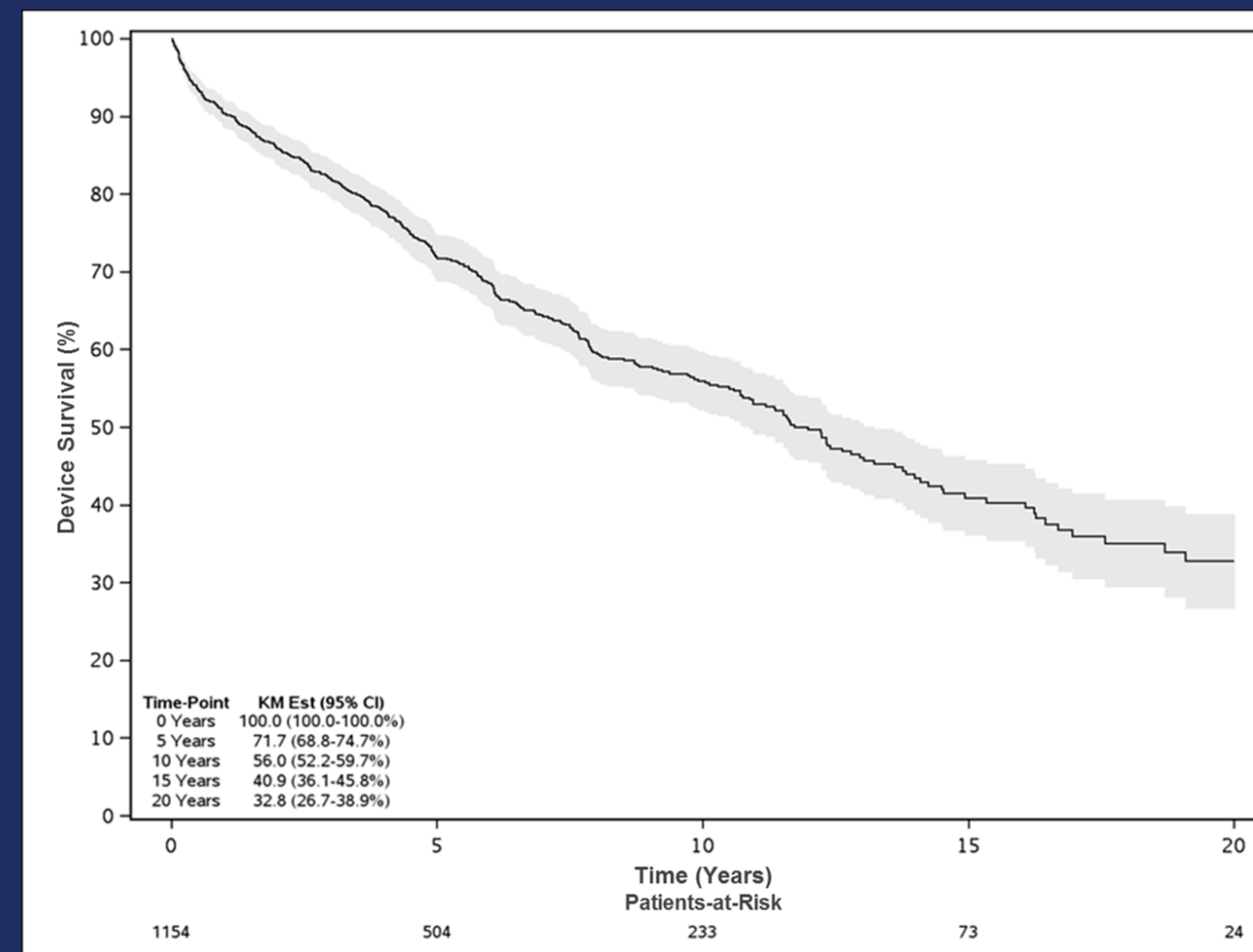
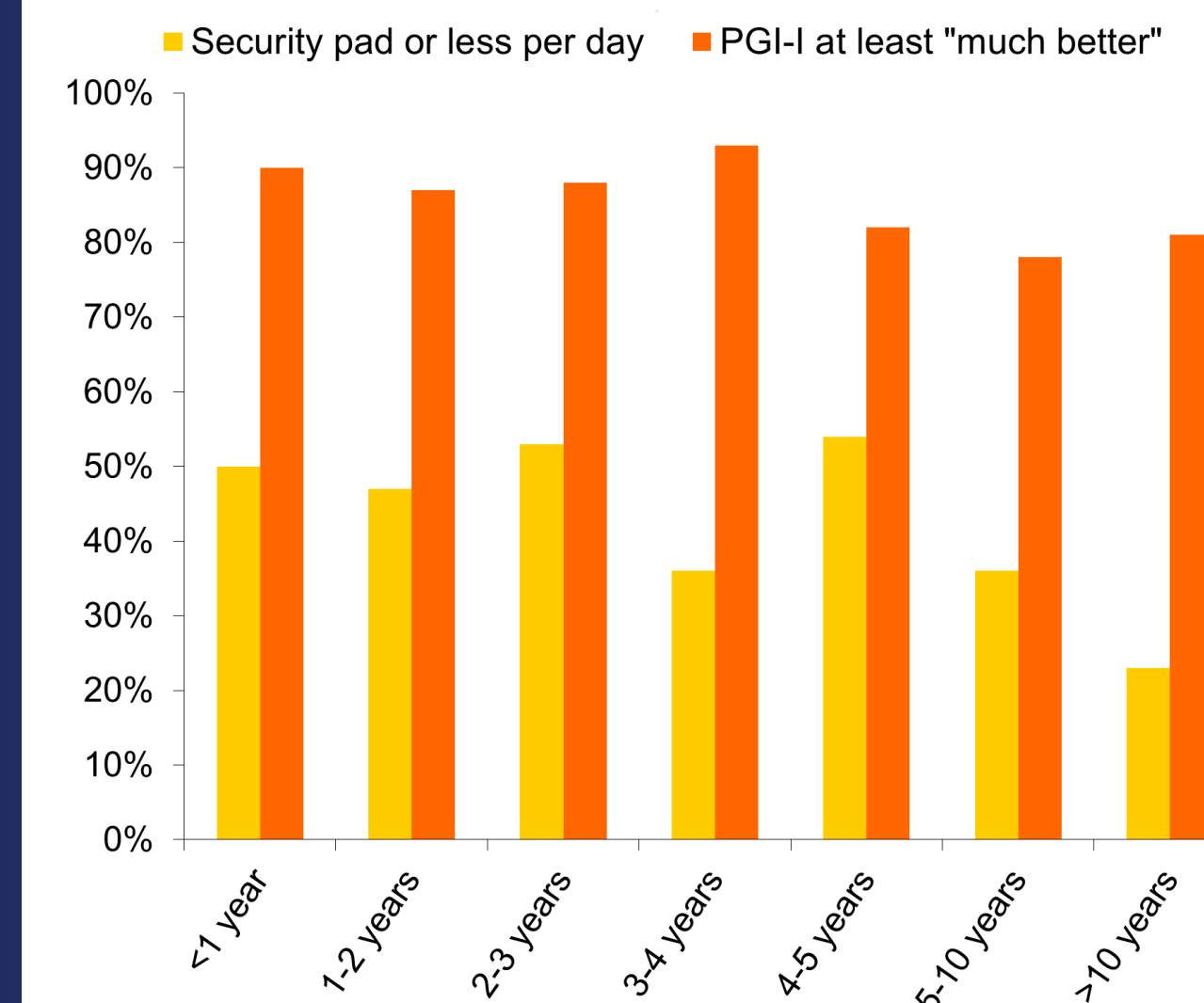


Figure 2: Quality of Life Assessments



Results continued

- Of patient factors, only prior cryotherapy was associated with need for secondary surgery on multivariable analysis (HR 2.4, 95% CI 1.3-4.2; p < 0.01). Univariate analysis of factors in table 1 not pictured.
- It is unclear if cryotherapy itself is a risk factor, or if it is a surrogate for repeated or complex cancer treatments
- Despite declining rates of needing a security pad or less per day (to about 23% at >10yr follow-up), >78% of patients consistently reported their PGI-I as at least "much better" over all follow-up intervals.

Conclusion

AUS has satisfactory durability, decreasing continence rates with time, but sustained improvement in patient quality of life

Results

- 1,154 patients with median follow-up 5.4 years (IQR 1.6-10.5).
- Radical prostatectomy was the most common cause of incontinence (61% RP alone, 27% also had radiation).
- 35% of AUS patients required a secondary surgery during follow up, with most common causes being device malfunction and urethral atrophy, both at median 4.4 to 4.5 years.
- Device survival was 72% at 5 years, 56% at 10 years, 41% at 15 years, and 33% at 20 years.

References

1. Linder BJ, Rangel LJ, Elliott DS. Evaluating Success Rates After Artificial Urinary Sphincter Placement: A Comparison of Clinical Definitions. Urology. 2018; 113: 220-4.