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Introduction

Adjustable TransObturator Male System (ATOMS) is an established surgical procedure for the treatment of stress male urinary incontinence. To date there are only few studies evaluating the durability of ATOMS. The aim of this study was to access the continence and the failure rate after implantation of Adjustable TransObturator Male System (ATOMS) for the treatment of male stress urinary incontinence (SUI), as well as to identify the underlying risk factors for the failure.

Methods

The data of all patients receiving an ATOMS implantation between 2010 and 2021 at the Urology Department, Medical University of Graz were prospectively entered into our ATOMS-database during the regular follow-up and analysed retrospectively. The primary endpoints were continence (daily pad usage), as well as failure (explantation rate). The pad numbers per day are presented as median, minimum, and maximum. The implant survival rate was estimated by using the Kaplan-Meier method. The risk factors for explantation (body mass index, age at ATOMS surgery, diabetes mellitus, port generation, previous transurethral or incontinence surgery) were analysed by multivariable Cox regression.

Results

A total of 80 patients underwent an implantation of the ATOMS device during the observation period. **The median follow-up was 3 (0,1 to 10,7) years.** Mean body mass index was 27.6 (± 3.4) kg/m², mean age at surgery was 69.8 (± 7.2) years. Sixty three patients (78.8%) had stress urinary incontinence, 17 (21.3%) had mixed urinary incontinence. In 63 patients (78.8%) the incontinence occurred following open radical prostatectomy, in 5 patients (6.3%) following laparoscopic radical prostatectomy and in 12 patients (15.0%) following transurethral resection of the prostate (TURP). Thirteen patients (16.3%) had recurrent stress urinary incontinence after previous unsuccessful incontinence surgery. Thirty three patients (41.3%) became an inguinal port, 47 (58.8%) a scrotal port (Table 1). The previous incontinence surgeries performed were: ProACT, Argus, InVance, Macroplastique and in one patient ATOMS.

Number of patients	80
Age at ATOMS surgery (mean \pm SD)	69.8 (± 7.2)
Inguinal port (n, %)	33 (41.3%)
Scrotal port (n, %)	47 (58.8%)
Body mass index (kg/m ²)	27.6 (± 3.4)
Stress urinary incontinence (n, %)	63 (78.8%)
Mixed urinary incontinence (n, %)	17 (21.3%)
Recurrent stress urinary incontinence (n, %)	13 (16.3%)
Open radical prostatectomy (n, %)	63 (78.8%)
Laparoscopic radical prostatectomy (n, %)	5 (6.3%)
Transurethral resection of the prostate (TURP) (n, %)	12 (15.0%)

Tabelle 1: patient characteristics at surgery

Continence status

The median number of pads decreased from 5 (1-12) pads per day preoperatively to 2 (0-8) pads 12 months postoperatively, 3 (0-7) pads 60 months postoperatively and 3 (1-7) pads 132 months postoperatively (Figure 1).

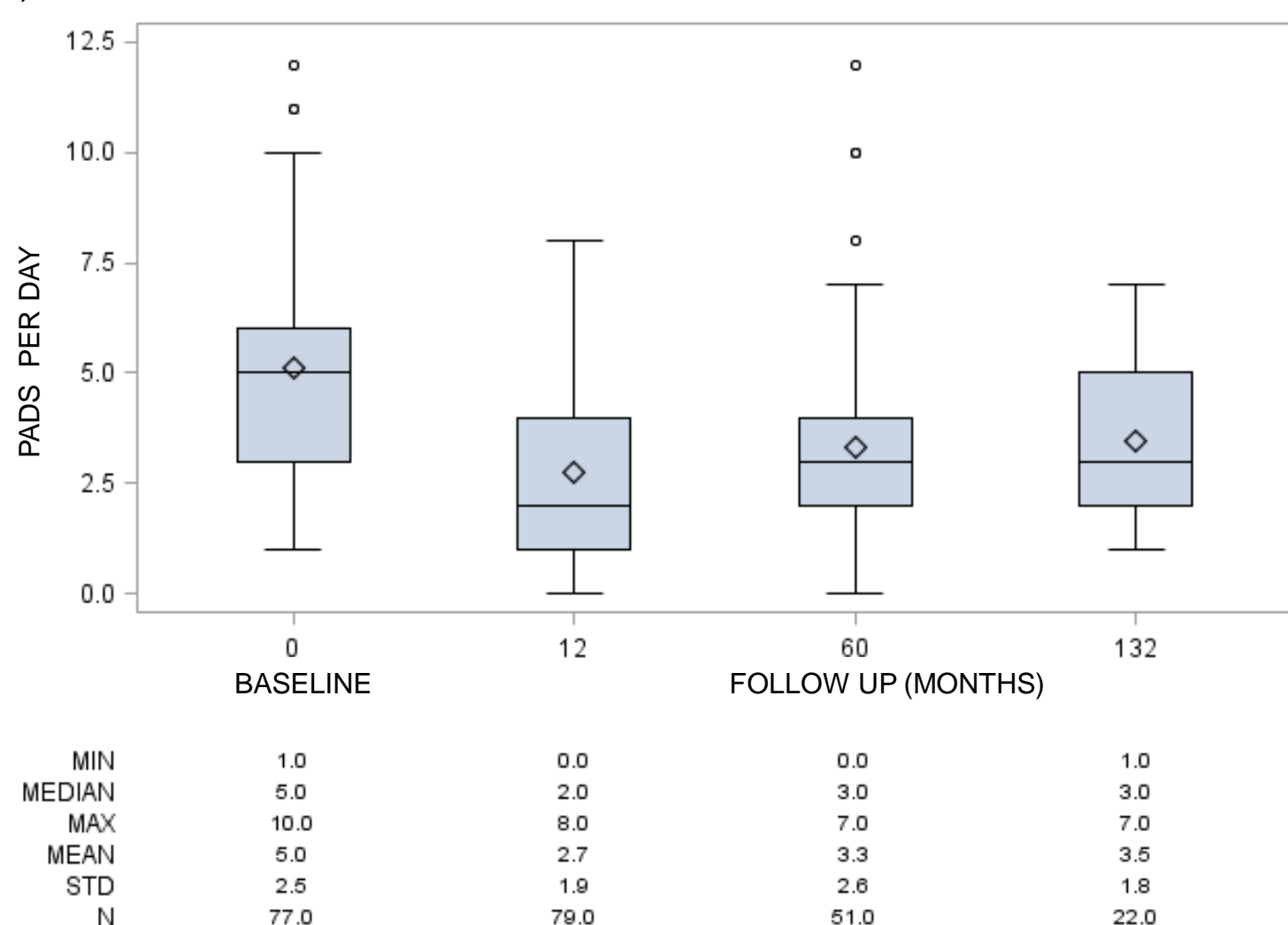


Figure 1: Pads per day

Assessment of failure rate

During the first year following ATOMS implantation 8 patients required an explantation, which resulted in a **one-year-implant-survival rate of 0.89 (95% confidence interval, CI: 0.80–0.95).**

After 5 years 17 patients had experienced an explantation, resulting in the **5-year-implant-survival rate of 0.71 (95% CI: 0.56–0.81).**

During the total observation time 22 explantations (27.5%) were performed (**Kaplan-Meier estimate: 0.35 (95% CI: 0.09–0.64)**) (Figure 2).

Fourteen patients (17.5%) were lost to follow-up and 3 patients (3.8%) had died.

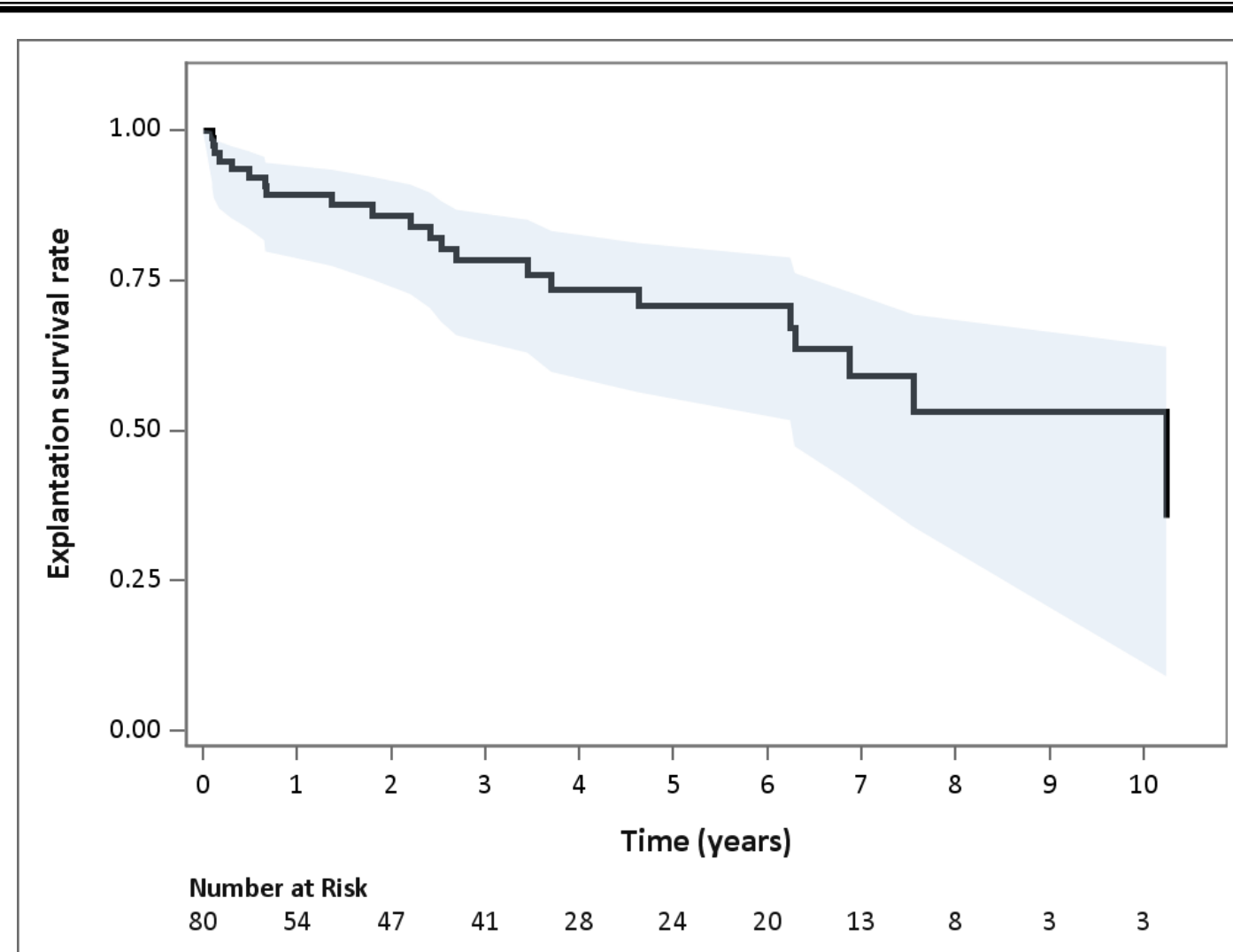


Figure 2: Kaplan-Meier estimation

The risk for explantation was higher in patients after previous incontinence surgery (hazard ratio = 3.4, 95% CI: 1.4–8.2, P=0.007, Figure 3).

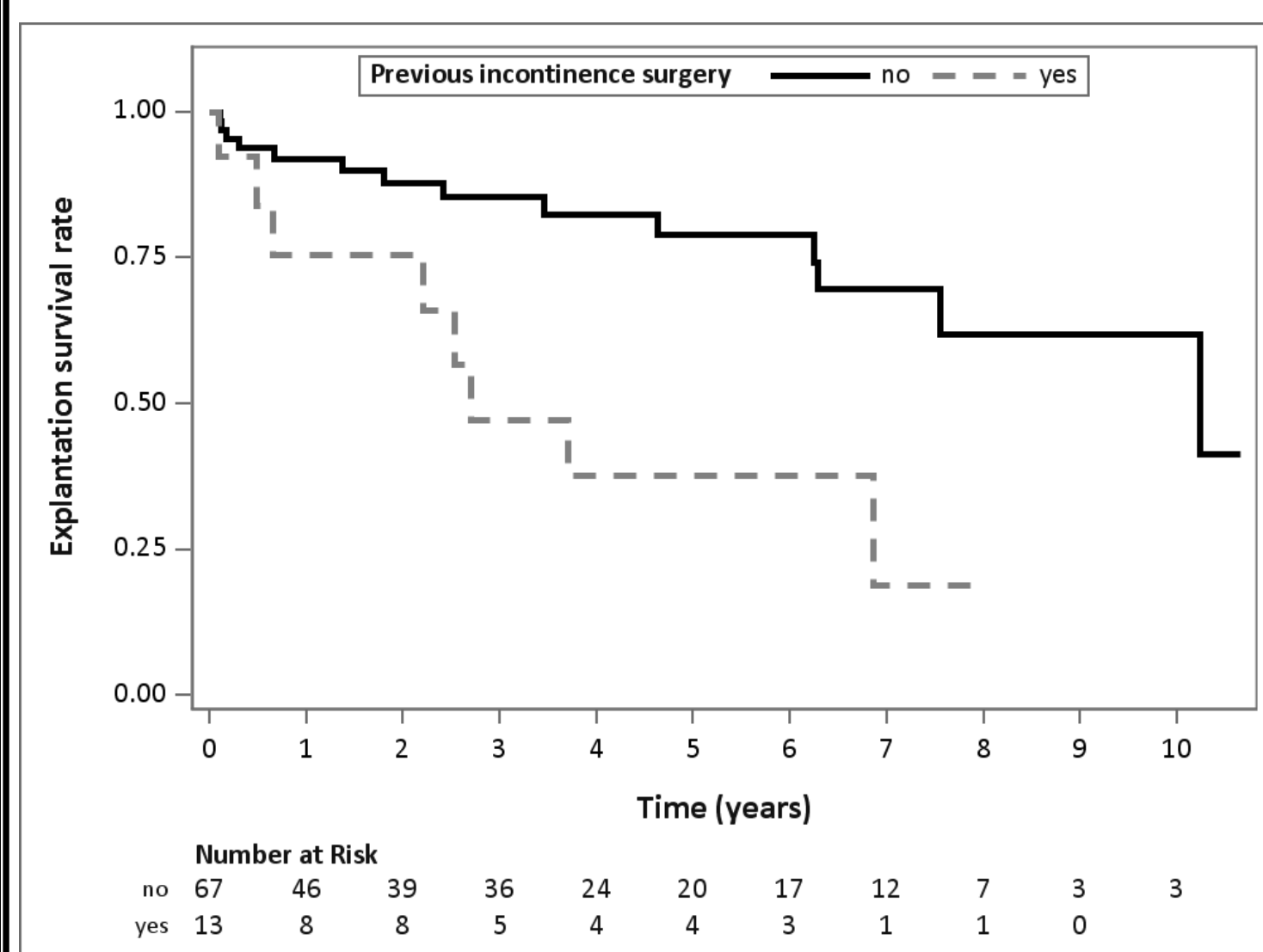


Figure 3: explantation rate depending on previous incontinence surgery.

For the other defined risk factors no significant association with the explantation rate could be observed (Table 2).

Parameter	Pr > Chi Sq	Hazard-Quotient	95% Hazard-Ratio Konfidenzgrenzen	
			Lower	Upper
BMI	0.6061	1.04	0.89	1.22
Age at ATOMS surgery	0.2838	1.03	0.98	1.09
Diabetes mellitus	0.1538	2.12	0.76	5.93
Previous transurethral surgery	0.7091	1.22	0.44	3.39
Adjuvant therapy	0.7941	0.87	0.29	2.58
Scrotal port	0.5099	0.70	0.24	2.02

Table 2: risk factors for explantation rate.

Conclusions

ATOMS leads to reduction of pad usage. During the intermediate-term follow-up approximately every 3rd patient experienced device explantation. Especially patients with recurrent stress urinary incontinence after previous unsuccessful incontinence surgery should be warned about the relevant risk of explantation. In these patients artificial urinary sphincter might be considered as a primary therapy of choice. Study limitations include a relatively small sample size, especially for the long-term follow-up.

References

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