

2-STAGE SACRAL NEUROMODULATION FOR TREATING CHRONIC URINARY RETENTION IN WOMEN: OUTCOME AND RESPONSE PROGNOSTIC FACTORS

Objectives: The aim of this survey was to assess the results of 2-stage sacral neuromodulation (SNM) for treating chronic urinary retention in women and to determine factors that predict response.

Materials and Methods:

Since 2004, 2-stage sacral neuromodulation has been performed in 100 women with chronic urinary retention. Common urological and neurological investigations had failed to identify a cause for retention and as part of their evaluation. The women underwent urethral pressure profilometry (UPP) and urethral sphincter EMG.

Results: Mean age was 36.9±10.9 years and 63% of women were in complete urinary retention whilst the others had incomplete retention (mean PVR= 381.4 mL). In 52%, there was a precipitating factor, such as a prior anaesthetic episode. 25% of patients were regularly taking opiates.

Mean maximum static and dynamic urethral closure pressures were 100.1 ± 26.0 and 111.6 ± 28.9 cmH₂O, respectively. Mean sphincter volume was 1.95±0.60 cm³. 47 patients (79.6 %) who underwent urethral sphincter EMG had abnormalities consistent with a primary disorder of sphincter relaxation. The aetiology for urinary retention included: primary disorder of sphincter relaxation (defined by EMG abnormality plus high UPP) in 44%, possible primary disorder of sphincter relaxation in 19 %, undetermined in 21 % and post-operative retention in 4%. Twelve patients had incomplete investigations.

Stage-1 was successful in 81 % but did not restore voiding ability in 19. Adverse-events were noted in 17 patients. These included back or leg pain (n=8), local infection (n=7) and syncope (n=1). Stage-1 was repeated in 12 patients had only UPP. Patients with abnormal EMG and a diagnosis of a primary disorder of sphincter relaxation had significantly better results following stage 1 (table 1).

Table 1 Outcome following stage 1

	Success (n=81)	Failure (n=19)	P
Age	36.7±11.0	38.1±10.7	ns*
Opiates treatment			
Yes	21	4	ns
No	60	15	
Complete retention			
Yes	53	10	ns
No	28	9	
Precipitating factor			
Yes	41	11	ns
No	40	8	
Mean static urethral closure pressure (cm H ₂ O) (n=89)	99.8±26.5	103.6±25.8	ns
Mean dynamic urethral closure pressure (cm H ₂ O) (n=89)	109.3±28.8	119.1±32.2	ns
EMG (n= 59)			
Abnormal	41	6	0.036
Normal	7	5	
Cause of urinary retention			
Primary disorder of sphincter relaxation	41	3	0.009
Other causes	40	16	

*ns: not significant

Stage-2 procedure was carried out in 77 patients (mean follow-up: 22.5±17.4 months). Two patients discontinued, one awaiting surgery and one lost to follow-up. SNM restored complete voiding in 54 patients (70.1 %), improved bladder emptying in 9 patients (11.7 %) but failed to improve voiding in 14 patients (18.2 %).

Revision surgery was required in 40 (52 %) patients with a median of 1 (range1-5) revision. Indications for revision were leg pain (n=7), lead displacement (n= 9), loss of efficacy (n=8), battery site pain (n=7), battery site infection (n= 2), lead fracture after fall (n=2), battery failure (n=3), lead connector dysfunction (n=1) and leg weakness (n=1). New procedures included battery change (n=9), lead change (n=18), implant resite (n=15) and lead and implant removal (n=6).

Patients with abnormally elevated urethral closure pressure had significantly better results following stage 2. The failure of EMG abnormalities to predict outcome may be related to the fact that 32 (41 %) did not have this test.

Table 2 Outcome following stage 2

	Success and Improvement n=63	Failure n=14	P
Follow-up	21.8 ± 2.3	26.7 ± 4.6	ns
Age	35.9 ± 1.3	40.9 ± 4.0	ns

Opiates treatment			
Yes	18	2	ns
No	45	12	
Complete retention			
Yes	43	6	ns
No	20	8	
Precipitating factor			
Yes	30	6	ns
No	33	8	
Mean static urethral closure pressure	103.5 ± 3.5	86.5 ± 7.5	0.04
Mean dynamic urethral closure pressure	112.8 ± 3.9	102.1 ± 8.7	ns
Abnormal EMG			
Yes	30	7	ns
No	6	2	
Cause of urinary retention			
Primary disorder of sphincter relaxation	34	6	ns
Other causes	30	7	

Interpretation

Our results demonstrate that women with a primary disorder of sphincter relaxation as determined by elevated urethral closure pressure or abnormal urethral sphincter EMG have a better outcome in 2-stage sacral neuromodulation. This is consistent with a previous study that evaluated outcome in women undergoing the one-stage procedure (1).

Conclusion: This study demonstrates that the presence of elevated UPP or abnormalities in urethral sphincter EMG, indicators of a primary disorder of sphincter relaxation, in women with chronic urinary retention is predictive factors for success following two-stage sacral neuromodulation. Although sphincter EMG is a difficult test, UPP is a standard investigation and is recommended as a useful test to select women for 2-stage SNM.

References

1. De Ridder D, Ost D, Bruyninckx F. The presence of Fowler's syndrome predicts successful long-term outcome of sacral nerve stimulation in women with urinary retention. Eur Urol. 2007;51:229-33

Specify source of funding or grant	none
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	No
This study did not require ethics committee approval because	results of a licensed procedure performed in routine
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	No