# 158

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**Title:** DO PATIENTS WITH URINE RETENTION FOLLOWING HYSTERECTOMY FOR BENIGN DISEASE, RESPONDING TO SACRAL NERVE STIMULATION, HAVE NEUROGENIC BLADDERS?

**Aims of Study:**

Urinary retention is a rare complication of a hysterectomy for benign disease and can be treated with sacral nerve stimulation (1). The aim of the study was to demonstrate prospectively neurogenic damage in patients with urine retention responding to sacral nerve stimulation following hysterectomy for benign disease.

**Methods:**

From 8/95 till 10/99, 8 patients (43 ± 18 years) with urine retention of 25 ± 16 months (6 to 50 months) after hysterectomy for benign disease were prospectively evaluated and treated with sacral nerve stimulation. History revealed colposuspension in 4 women and symptoms of pelvic floor dysfunction in 7 women of whom 3 had a short episode of urinary retention. At cystometry the bladder was filled until pressures of 40 cm H2O, leakage, full bladder sensation or pain occurred. Micturition analysis was performed at full bladder and when impossible repeated at a capacity of 500 ml. Sensory evoked potentials (SEP), electrical sensory threshold measurements of the pudendal nerve, bladder neck and the bladder (2Hz, 0-300 Volts) and a needle electromyography of the external urethral sphincter (EUS) were realized in all patients (2-4). A percutaneous trial stimulation (S3 nerve) was performed unilaterally and in failures repeated bilaterally. When a trial stimulation was successful a quadripolar lead (model 3080) and a pulse generator (model IPG3) was implanted. Treatment follow-up was 39 ± 21 months. Urodynamics were repeated during the trial stimulation. Yearly follow-up was evaluated with a uroflowmetry and residual urine. Results are presented as mean +/- standard deviation. Statistical analysis is performed with a 2-tailed t-test and the Spearman rank correlation test.

**Results:**

Unilateral sacral nerve stimulation was performed in 5, bilateral in 3 patients. Revision was needed in 5 patients, explantation due to infection in 1. Last follow-up uroflowmetry revealed a Qmax of 18 +/- 10 ml/sec (NS compared to trial stimulation) with residual urine below 50 ml in 5, between 200-300 ml in 2 patients. Intermittent catherisation was needed in the explanted patient and in 3 implanted patients (1-2/day).

*Tabel 1: Urodynamics before and during the test-stimulation*

| | Base-line | Test-stimulation | p-value |
|---|---|---|---|
| **Cystometry** | | | |
| Capacity (ml) | 746 +/- 277 | 640 +/- 170 | NS |
| Compliance | 53 +/- 30 | 46 +/-24 | NS |
| First sensation (ml) | 537 +/- 168, NA(n=3) | 495 +/-172, NA(n=3) | - |
| First desire to void (ml) | 455(n=1), NA(n=7) | 365(n=1), NA(n=7) | - |
| Strong desire to void (ml) | 500(n=1), NA(n=7) | 500(n=1), NA(n=7) | - |
| **Micturition analysis** | | | |
| Q max (ml/sec.) | 9(n=1), 17(n=1), NA(n=6) | 23 +/- 11 | < 0.007 |

| | | | |
|---|---|---|---|
| Flow pattern | - | Normal(n=3), dysfunctional(n=5) | - |
| Residual (ml) | 653 +/-132 | 32 +/- 25 | < 0.0001 |

p-value, 2-tailed t- test NA: not applicable

De-afferentiation (electrical sensory threshold 200 Volts or higher) was limited to the bladder in 4/8, and extended to the bladderneck in 1 patient and matched with the abcense of response at SEP. Relative electrical sensory thresholds of the bladderneck correlate inversely with residual urine (r = -0.83, p=0.042, x=645 and f(x)=1.18) and bladdercapacity (r = -0.90, p=0.027, x=900 and f(x)=1.02) at diagnosis. Complexe repetitive discharges and decelerating bursts of the EUS were seen in the 1 patient with de-afferentiation of the bladderneck and in 1 patient without de-afferentiation.

*Tabel 2: De-afferentiation of the bladder and/or bladderneck following hysterectomy for benign disease*:

| **Sensory Evoked Potentials** | Latency (N1) | No response | Reference values |
|---|---|---|---|
| Pudendal nerve (millisec.) | 31.0 +/- 2.6 | 0 | 33.57 +/- 2.14 |
| Bladder neck (millisec.) | 94.9 +/- 9.3 | 1* | 94.6 +/- 10.4 |
| Bladder (millisec.) | 102.4 +/- 28.44 | 4 | - |
| **Other tests** | | | |
| Relative electrical sensory threshold bladderneck-clitoris | 1.17 +/- 0.33 | - | - |
| Relative electrical sensory threshold bladder-clitoris | 3.99 +/- 2.08 | - | - |
| Complexe repetitive discharges EUS (n) | 2 | - | - |

*patient without pre-existent pelvic floor dysfunction EUS : external urethral sphincter

**Conclusion**: Urine retention following hysterectomy for benign disease is associated with de-afferentiation of the bladderwall in 4 patients, with pre-existent pelvic floor dysfunction in 7/8 patients and correlated with the relative electrical sensory threshold of the bladderneck. One patient was de-afferentiated at bladder and bladderneck and had no pre-existent pelvic floor dysfunction. A high need for bilateral implantation was observed.

**References**


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