cured; three (20.0%) showed significant improvement; and five (33.3%) were classified as non-responders. Urodynamic evidence of bladder instability, evident in all patients prior to treatment, was eliminated in 76.9% of patients. In all patients, mean (SD) total bladder capacity increased significantly from a 197 (35–349) to 252 (78–384) ml (p=0.00795), mean (SD) volume at first bladder sensation from 95 (16–174) ml to 133 (32–214) ml (p=0.00166) and mean (SD) bladder volume at normal desire to void from 133 (27–217) ml to 188 (47–296) ml (p=0.00232). In the responding group, the mean (SD) total numbers of voids was reduced from 16.1 (9–24) times during the day and 4.4 (2–6) times during the night to 8.3 (6–10) and 1.4 (1–2) times (p=0.002539), respectively. In addition we observed a decrease in the number of protective pads from 4.9 to 1.6 per day.

Conclusions: Peripheral neuromodulation of the S3 region can successfully treat patients suffering from urgency-frequency syndrome due to an overactive bladder. Morbidity of this treatment is negligible. Clinical results may be improved by proper patients selection since patients with severe anatomical deficiency, interstitial cystitis and neurological disorders seem to be unsuitable candidates for this technique.

Aknowledgment: The SANS device was provided by UroSurge Inc. Iowa, USA and the study was approved by the local ethics committe ( No. EK 327/98).

# 120

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

RELATIONSHIP BETWEEN DETRUSOR INSTABILITY AND URETHRAL RESISTANCE IN PATIENTS TREATED WITH SACRAL NEUROMODULATION

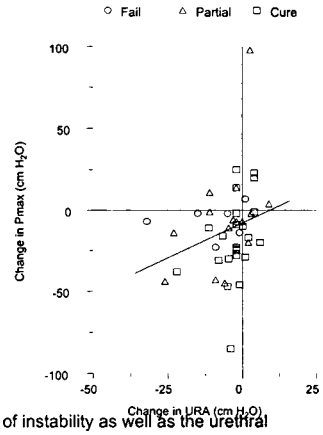
AIMS. Sacral neuromodulation is a treatment option for patients with detrusor instability [1]. This method has also been shown to decrease urethral resistance during voiding [2]. We previously found that urethral resistance was higher in a group of females with detrusor instability than in females with mixed incontinence or stress incontinence or females without a demonstrable cause of the incontinence and postulated that functional obstruction could be a potential cause of instability [3]. In the present study, we examined the relationship between the decrease of urethral resistance and that of the grade of instability in patients with detrusor instability treated with neuromodulation. In addition, we examined if the symptomatic changes as derived from voiding / incontinence diaries depended on urethral resistance. Such a study might contribute to the understanding of the role of voiding characteristics in the signs and symptoms of detrusor instability.

METHODS. Neuromodulation is applied at our department since 1990. Voiding / incontinence diaries and cystometric studies with subsequent pressure / flow studies before and 6 months after the operation are part of the evaluation. Cystometry is done in the supine and standing position and, after implantation, with the stimulator on and off. The pressure / flow studies are done in the standing position. Only patients with symptoms of urge incontinence and urodynamically demonstrated detrusor instability who had passed the 6 month evaluation period were included in the present study. The maximum detrusor pressure Pmax during the filling phase was used as the parameter characterising the grade of instability. Urethral resistance was characterised by URA. In addition, the maximum flow rate Qmax and the associated detrusor pressure pQmax were determined. The measurements in the standing position and, after implantation, with the neurostimulator on, were used. Three categories of symptomatic success were defined: a more than 90% decrease in the number of pads used per day or the number of incontinence episodes

per day was considered a cure, a decrease between 50 and 90% was considered a partial success and a decrease of less than 50% was considered a failure.

RESULTS. Of the 47 patients implanted so far, 44 (38 women, 6 men, mean age 46 years) underwent the 6 month follow-up examinations. Symptomatically, 23 patients were cured, 15 were a partial success and in 6 treatment failed. The table summarises the mean values and interquartile ranges of the urodynamic parameters for all patients and for the symptomatic categories separately. On average, Pmax as well as URA decreased significantly (paired t-test: p=0.004 and p<0.0005, respectively). Qmax increased significantly (p=0.007). The change in pQmax, however, was not significant (p=0.19). The high initial mean values of URA and pQmax in the patients who failed were caused by one patient only: they were 19 and 39 cm $H_2O$, respectively, in the remaining 5 patients. None of the parameters listed in the table demonstrated significant differences between the symptomatic categories (unpaired t-tests, Kruskal-Wallis test). The figure demonstrates the relationship between the changes in Pmax and URA. The Pearson correlation coefficient r was 0.27, which was not significant (p=0.081). The Spearman rank correlation coefficient rho, however, was 0.34, which was significant (p=0.024). No dependence of the relationship on the symptomatic category was found. The relationship between the changes in Pmax and those in the voiding pressure pQmax looked very similar, but significance was reached in both tests (r = 0.52, rho = 0.54, p<0.0005).

| | | All (44) | Cure (23) | Partial (15) | Fail (6) |
|---|---|---|---|---|---|
| Pmax | before | 42 (25 - 56) | 47 (25 - 59) | 37 (25 - 50) | 35 (22 - 56) |
| (cm $H_2O$) | after | 30 (10 - 45) | 30 (17 - 41) | 33 (14 - 45) | 28 (6 - 48) |
| | change | -12 (-27 - -1) | -18 (-30 - -2) | -5 (-20 - 4) | -7 (-16 – 0) |
| URA | before | 21 (14 – 26) | 18 (14 – 19) | 22 (11 – 28) | 28 (14 – 39) |
| (cm $H_2O$) | after | 16 (11 – 20) | 15 (12 – 20) | 16 (12 – 22) | 18 (8 – 31) |
| | change | -5 (-8 – 1) | -3 (-5 – 1) | -5 (-11 – 2) | -10 (-19 - -1) |
| pQmax | before | 39 (27 – 50) | 38 (27 – 50) | 38 (29 – 52) | 47 (26 – 69) |
| (cm $H_2O$) | after | 36 (25 – 44) | 36 (21 – 57) | 37 (24 – 45) | 37 (21 – 57) |
| | change | -3 (-11 – 6) | -2 (-8 – 6) | -1 (-10 – 10) | -10 (-24 – 4) |
| Qmax | before | 13 (8 – 17) | 15 (9 – 17) | 10 (5 – 12) | 12 (7 – 18) |
| (ml/s) | after | 16 (10 – 20) | 17 (11 – 22) | 14 (10 – 17) | 14 (8 – 20) |
| | change | 3 (-1 – 5) | 2 (-1 – 4) | 4 (1 – 9) | 2 (-1 – 6) |




DISCUSSION. This study confirms that neuromodulation reduces the grade of instability as well as the urethral resistance during voiding. The correlation between these two entities, however, was weak. If the voiding pressure would be considered a measure of urethral resistance, the decrease of the instability could be "explained" by a decrease of the resistance for about 25% (coefficient of determination $r^2$). It has been shown that symptomatic changes only poorly correlate with changes of the grade of instability [1]. It might be hypothesised that the symptomatic outcome is correlated more strongly with voiding phase characteristics than with filling phase characteristics. This study does not give evidence supporting that hypothesis. Apparently non-urodynamic factors play a significant role in the success of neuromodulation.

[1]. Curr.Opin.Urol. 8: 287-291, 1998
[2]. Neurourol.Urodynam. 14: 502-504, 1995
[3]. Neurourol.Urodynam. 17: 386-388, 1998

# 121

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**CAN EARLY UROLOGICAL MANAGEMENT IMPROVE THE OUTCOME (UPPER URINARY TRACT, CONTINENCE) IN PATIENTS WITH MYELOMENINGOCELES ? – LONG TERM RESULTS**

Aims of study: in this retrospective study we evaluated whether there (A) is there a difference in the