

URETHRAL PRESSURE PROFILES IN PATIENTS WITH URINARY RETENTION TREATED SUCCESSFULLY WITH SACRAL NEUROMODULATION

Aims of Study

It has been shown previously that women with chronic urinary retention associated with a specific electromyographic (EMG) urethral sphincter abnormality can be treated successfully with sacral nerve stimulation. It has also recently been reported that the maximum urethral closure pressure (MUCP) is elevated in these patients compared to patients with retention but without the EMG abnormality. The higher pressure may be a direct result of contraction of the overactive sphincter. Although neuromodulation restores voiding in these women, the mechanism for this remains unclear. We have studied a series of patients undergoing either the test stimulation procedure (peripheral nerve evaluation, PNE) or implant of a permanent stimulator, and compared their static urethral pressure profile (UPP) before and after neuromodulation.

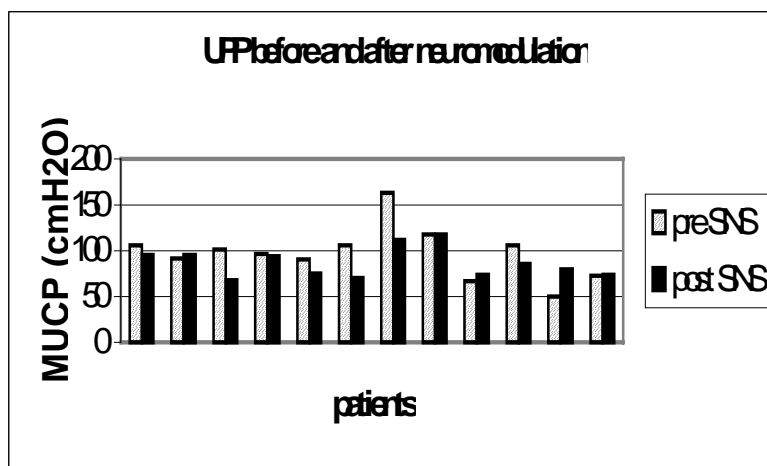
Methods

This series of 12 women with chronic urinary retention included 7 with an implanted sacral nerve stimulator and 5 who had undergone PNE (aged 25-48yrs, mean 36yrs). All patients had an abnormal urethral sphincter EMG, detected using concentric needle electrode, and were able to void spontaneously following neuromodulation. UPP measurements were performed before neuromodulation and after restoration of voiding; 3-5 measurements were taken for each patient with pelvic muscles relaxed, in the supine position, using an 8Fr perfusion catheter. 8 patients also agreed to have standard cystometry performed after successful neuromodulation, with results from the voiding phase described below.

Results

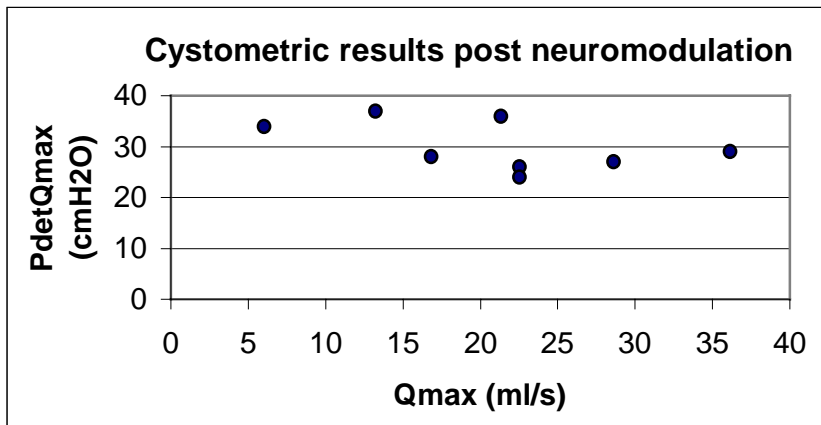
There was no significant difference between MUCP before (mean \pm s.d., $97.1\text{cmH}_2\text{O} \pm 28.4\text{cmH}_2\text{O}$) and after neuromodulation ($86.6\text{cmH}_2\text{O} \pm 16.4\text{cmH}_2\text{O}$) for all 12 patients ($p > 0.12$, paired samples t-test). No difference was found between patients undergoing PNE and those with long-term stimulators.

Figure 1: Maximum urethral closure pressure before and after sacral nerve stimulation (SNS)



Cystometry was performed in 8 patients with successful neuromodulation; the volume voided ranged from 91mls to 760mls (mean 401mls). Figure 2 below shows the detrusor pressure at the maximum flow rate, for each of these 8 patients, ranging from 24-37cmH₂O.

Figure 2: Cystometry in 8 patients after restoration of spontaneous voiding by neuromodulation



Conclusions

UPP was high at baseline in these patients with urinary retention and the sphincter EMG abnormality; this did not change significantly following neuromodulation. This suggests that sacral neuromodulation does not restore voiding by a direct relaxant effect on the overactive sphincter. However the detrusor pressure on voiding was not elevated after neuromodulation, as shown in figure 2.

These findings suggests that sacral nerve stimulation may facilitate voiding by suppression of an inhibitory mechanism possibly related to the sphincter's contraction. It remains to be determined whether this is at a central or a peripheral level.