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THE OUTCOME OF SACRAL NEUROMODULATION IN PATIENTS WITH NEUROGENIC VOIDING DYSFUNCTION

Hypothesis / aims of study
To assess the outcomes of sacral neuromodulation in patients with neurogenic voiding dysfunction.

Study design, materials and methods
Between 2007 and 2014, 22 patients with a neurological origin for their lower urinary tract dysfunction underwent 2-stage sacral neuromodulation [1,2].

Pre-operative assessment included a 3-day voiding diary, cystometrogram, uroflowmetry and post void residual bladder ultrasound scan. Patients suffering with chronic urinary retention also underwent urethral pressure profiling and urethral sphincter electromyography. Patient age, duration of lower urinary tract symptoms, neurological diagnosis, duration of neurological diagnosis, neurological disease stability, previous botulinum A toxin intradetrusor injections and opiate use were assessed. All patients completed quality of life questionnaires (ICI-Q BFLUTS, OAB-Q, VAS – pain score, ICIQ-LUTS and Wexner bowel questionnaire).
Following stage 1 surgery (implantation of tined lead connected to temporary external battery), the patients were assessed at 4 weeks, having completed a further 3-day voiding diary and quality of life questionnaire, with a uroflow and post void residual bladder ultrasound scan.

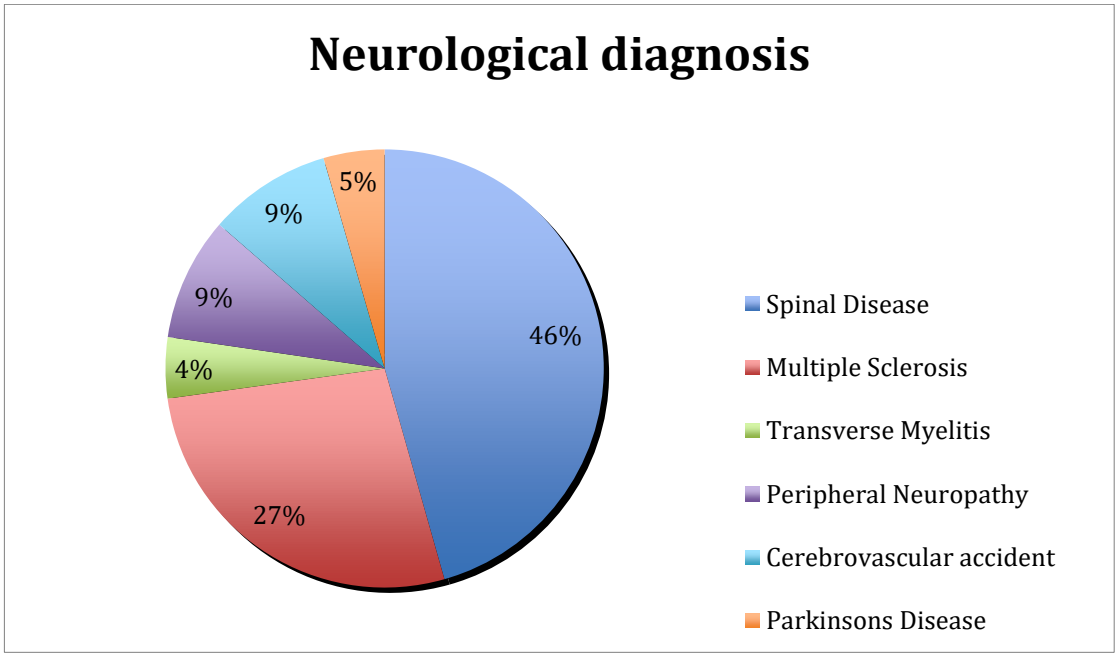
Criteria for assessing response were dependent on the patients' lower urinary tract symptoms pre-operatively. For patients with an overactive bladder, a greater than 50% improvement in urgency score, voided volume and reduction in leakage episodes was deemed a successful response. For patients with chronic urinary retention, restoration of normal bladder sensation, onset of successful voiding and a 50% improvement in post void residual bladder volume were the success criteria. Patients with a successful response to stage-1 went on to stage-2.

6 weeks following stage-2 (implantation of a permanent implantable pulse generator), patients were assessed by our clinical nurse specialist, having completed a further 3-day voiding diary and quality of life questionnaires, with a uroflow and post void residual bladder ultrasound scan. Clinician follow-up was at 3 months, 6 months and then annually thereafter.

Statistical analysis was performed using SPSS software (IBM SPSS Statistics 22, IBM corporation). A p value of <0.05 was considered statistically significant. A Mann-Whitney U Test was performed to analyse the impact of age, pre-operative post void residual volume and duration of voiding dysfunction on outcome. Fischer's Exact Test was performed to assess the impact of gender, previous intradetrusor botulinum A toxin injection and opiate use on outcome.

Results
Of the 22 patients included in our study, 17 (77%) were female and 5 (23%) were male. Median age was 48 years (range 31-49 years). Median duration of pre-operative lower urinary tract symptoms was 7 years (range 4-11.5 years). The most common voiding dysfunction was chronic urinary retention (CUR) (12 patients (55%)), followed by overactive bladder (OAB) (6 patients (27%)) and then mixed symptoms of CUR and OAB (4 patients (18%)).

Interpretation of results
Distribution of neurological diagnosis is shown in the chart below:



Stage-1 surgery was successful in 18 patients (82%). Overall, there was a trend towards improved outcome following stage-1 surgery in younger patients with the median age in patients with a successful outcome being 43.5 years compared to 53 years in those who failed (p=0.08).

Sub-group analysis of the patients with CUR (n=12) showed a successful response to stage-1 surgery in 83% (n=10). 2/3 of this group were female. Median PVR fell from 700 +/- 552 mls pre-operatively to 65+/-73mls post stage-1.

Analysis of the OAB patients (n=6) showed a successful response to stage-1 surgery in 67% (n=4). All patients in this group were female. Analysis of the patients with mixed symptoms (n=4) demonstrated a successful response to stage-1 surgery in 100%. Analysis of the multiple sclerosis patient sub-group (n=6) revealed that 67% had a successful stage-1 trial.

Wound infection occurred in 6 patients following stage 1 surgery.

17 of the 18 patients with a successful stage-1 outcome went on to stage-2. All patients achieved more than 50% improvement in their symptoms following stage-2. At a mean follow-up of 25 months (range 5-76 months) this response was maintained in 88% of patients (n=15).

Further surgical intervention was required in 4 patients (24%) following stage 2 surgery.

Full results will be given at abstract presentation.

Concluding message

Stage-1sacral neuromodulation was successful in 82% of patients with neurogenic bladder dysfunction. Following stage-2 a sustained success rate of 88.2% at a mean follow-up of 25 months was seen. Our results are comparable to other studies using the staged approach [3]. We conclude that sacral neuromodulation should be offered to patients with neurogenic bladder dysfunction due to the high success rate and continued response demonstrated by our retrospective study.

References

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Disclosures

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