Pediatric Sacral Neuromodulation:

Insights from a Single-Center Experience in Lower Urinary Tract Dysfunction.

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Introduction:

Although sacral neuromodulation is widely acknowledged as a third-line treatment for adult patients with various Lower Urinary Tract and Bowel Dysfunctions, its application in children under 16 years old lacks FDA approval and is relatively novel. Nevertheless, SNM has been progressively explored in pediatric patients with voiding and bowel dysfunction showing encouraging results[1]. Here we report our SNM experience in pediatric patients with LUTD.

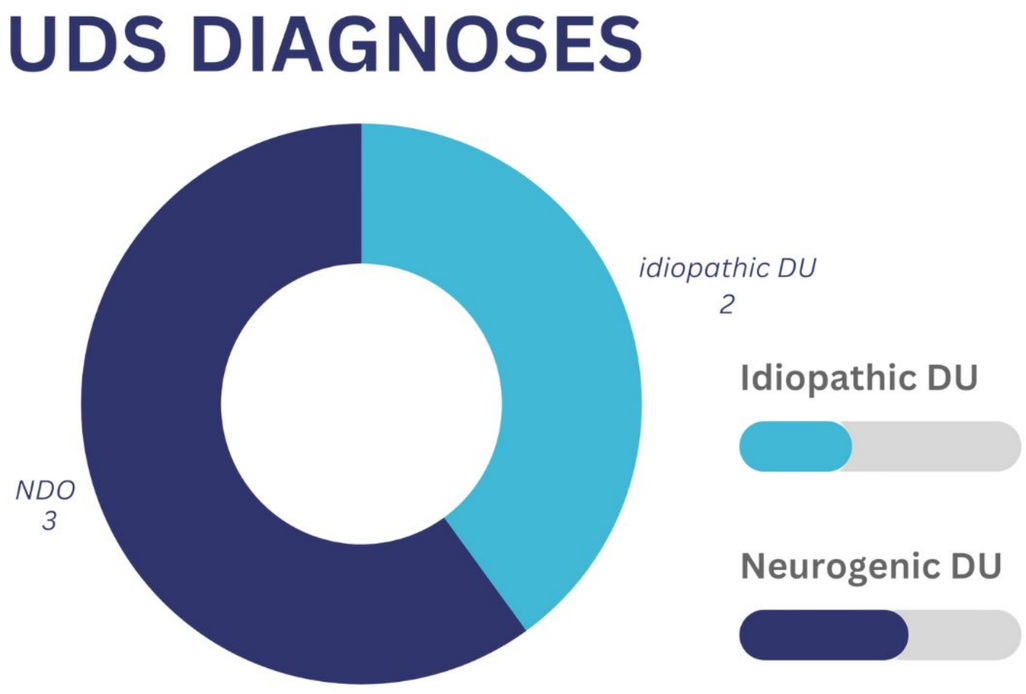
Study design, materials and methods:

A retrospective cohort study was conducted between March 2019 and March 2024. It included all patients aged from 10 to 16 years of age who were diagnosed with various Lower Urinary Tract Dysfunction refractory to conservative therapy and who proceeded with the Sacral neuromodulation test phase. We assessed their pre-op UDS diagnosis, conversion rate to permanent implantation, response rate (>50%) and the need for re-programming at 6 weeks and 6 months post-operatively. Any surgical revisions during the 6 months post-operatively were reported.

Results:

A Total of 5 patients with ages ranging from 10 to 16 years (Median 11). All patients are female and were diagnosed with chronic urinary retention (2 patients with idiopathic non-obstructive urinary retention, 1 with Spina bifida, 1 with Miningomeylocele and 1 with non-neurogenic neurogenic bladder) with respective UDS diagnoses as follows: idiopathic DU (2 (40%)) and Neurogenic DU (3 (60%)). All patients were refractory to conservative therapy. None of them had Bowel dysfunction. All were ambulatory. They underwent Stage I with MRI-compatible lead insertion under GA (Medtronic).

All patients showed a response >50% and had permanent implants (4 InterStim micro, 1 InsterStim II). All patients started to void freely with minimal PVR and abandoned self-catheters (response >50%) at 6 weeks post-op without re-programming. The response was maintained at >50% in all patients at 6 months post-op without the need for re-programming except for 1 patient who had reprogramming for lower limb pain. No surgical revision was done in the first 6 months post-implantation.



Interpretation of results:

These results suggest that Sacral Neuromodulation has the potential for encouraging outcomes in pediatric patients with LUTD[2]. Six months is a relatively short period. Therefore, we will follow the future effect of somatic growth on the outcome and the lead location at 1 and 2 years. Prospective studies of extended duration and larger sample sizes are needed to determine optimal candidates and assess long-term outcomes, and potential complications.

Conclusions:

Sacral Neuromodulation has the potential for substantial improvement of LUTD in pediatric patients. Prospective studies of extended duration and larger sample sizes are needed to determine optimal candidates and assess long-term outcomes and potential complications.

References

1. Kuo, H. C., & Lee, W. C. (2015). Sacral neuromodulation for refractory overactive bladder: A systematic review and meta-analysis. The Journal of Urology, 194(6), 1580-1585.
2. Malallah, M., Cameron, A. & Sack, B. The Evidence for Implantable Sacral Neuromodulation in Pediatric Voiding Dysfunction. Curr Bladder Dysfunct Rep 19, 231–237 (2024).