

Juan Carlos Castaño<sup>1</sup>, Hugo Osorio<sup>2</sup>, Andrés Chica<sup>2</sup>, Natalia Acosta<sup>3</sup>, Adrián Lopera<sup>1</sup>

1. Urologist, Department of urology and neurourology, CES clinic, Medellín, Antioquia, Colombia

2. Urology resident, Department of urology, CES University, Medellín, Antioquia, Colombia.

3. Medicine student, Universidad Pontificia Bolivariana, Medellín, Antioquia, Colombia.

## INTRODUCTION

Sacral neuromodulation (SNM) has become a standardized treatment option for patients with neurogenic and no neurogenic lower urinary tract dysfunction, without response to conservative medical management. Studies are limited in the number of patients. In Colombia, there is no study validating the success of this treatment in patients with voiding dysfunction, painful bladder, overactive bladder and fecal incontinence.

## METHODS

During 2013 and 2015 in Medellín, Colombia; an observational, analytical and retrospective study was carried out in 60 patients with different indications of sacral neuromodulation. For each indication the satisfaction and improvement of symptoms were determined after procedure.

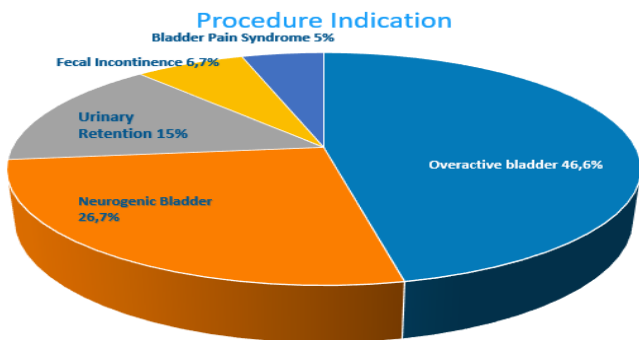


Figure 1: Distribution of the indications of surgery and groups of patients.

TABLE 1: Other variables in the study:

- History of spinal cord trauma 8,3%
- High blood pressure 26,7%
- Diabetes 11,7%
- Smoking 15%
- Preoperative catheterization 36,7%
- Site of implantation: Right 43%, left 53%, bilateral 3%
- Surgical complications 5%
- Re intervention 16% (mechanical failure 60%)

## RESULTS

In this study, 43 patients (71.7%) were female and 17 (28.3%) were male. The mean age was 51.53 years with an interval of 12 to 86 years. The average follow-up was 20.65 months. In total, five indicators were used to perform the procedure (figure 1). Other variables were analyzed in this study (table 1).

Patients demonstrated improvement in pelvic pain, less requirement of clean intermittent catheterization and less urinary and fecal incontinence.

Concerning our main outcome, symptomatic improvement and satisfaction were observed in 83.34% of the patients, demonstrating an improvement over a 50% of the symptoms and allowing patients to perform tasks in which were limited previous to sacral neuromodulator implantation. An additional important fact is that 87% of patients with neurogenic bladder presented symptomatic improvement and satisfaction (table 2).

Table 2. Satisfaction, symptom improvement

	N°	% total/100%
<b>Recommendation of sacral neuromodulation to other people</b>		
Yes	55	91,66%
No	5	8,34%
Neurogenic	0	0%
No neurogenic	5	8,3%
<b>Would undergo to procedure again</b>		
Yes	48	80%
No	12	20%
Neurogenic	2	3,33%
No neurogenic	10	16,66%
<b>Symptomatic improvement and satisfaction</b>		
Less than 50%	10	16,66%
Over 50%	50	83,34%
Neurogenic	14	23,33%
No neurogenic	36	60%

While describing the type of variables and correlating with the indication of sacral neuromodulation, a statistically significant relationship ( $p < 0.05$ ) was observed in the presence of a neurogenic disorder and the performance of clean intermittent catheterization ( $p$  value 0.0001 for both). In addition, an association between the presence of fecal incontinence and chronic pelvic pain ( $p$  value of 0.030 and 0.032, respectively) was evident. (Table 3).

TABLE 3. Association of preoperative variables and indication of sacral neuromodulation. Statistically significant value  $p < 0,05$

Preoperative variable	Indication of sacral neuromodulation
Neurogenic disorder	0,0001
Intermittent catheterization	0,0001
Incontinence yes/no	0,198
Nocturia	0,239
Leakage frequency Sandvik	0,78
Amount of leakage Sandvik	0,174
Fecal incontinence	0,030
Pelvic pain	0,032
Complications	0,605
Undergo to procedure again	0,586
Recommending to others	0,051
Symptomatic improvement and satisfaction with procedure	0,308

When analyzing the variables with the improvement of symptoms and satisfaction above 50%, only nocturia was statistically significant as a predictor of postoperative improvement ( $p$  value = 0.013). Other variables were not statistically significant (table 4).

TABLE 4. Variables association with significant clinical improvement. Statistically significant value  $p < 0,05$

Variable	Improvement of symptoms and satisfaction over 50% with sacral neuromodulation
Gender	0,370
Neurogenic disorder	0,219
History of spinal cord injury	0,612
History of hypertension	0,794
History of diabetes mellitus	0,857
Smoking history	0,628
Clean intermittent catheterization	0,231
Incontinence	0,724
Nocturia	0,013
Urinary frequency Sandvik	0,698
Amount of urine leak Sandvik	0,971
Fecal incontinence	0,531
Pelvic pain	0,208

## CONCLUSIONS

This study showed that SNM seems to be an effective therapy for both neurogenic and non-neurogenic lower urinary tract dysfunctions. It also revealed nocturia as a predictor of postoperative improvement, making it an objective benefit of the procedure in both conditions. The other variables were not statistically significant. Improvement of symptoms and satisfaction were present in an important number of patients, thus transforming sacral neuromodulation in an effective therapy for our population. Symptomatology improvement was also present in patients with fecal incontinence, overactive bladder, chronic pelvic pain and neurogenic bladder.

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