

## **PERCUTANEOUS RADIOFREQUENCY SACRAL RHIZOTOMY IN THE TREATMENT OF NEUROGENIC DETRUSOR OVERACTIVITY IN SPINAL CORD INJURED PATIENTS.**

### Hypothesis / aims of study

Neurogenic detrusor overactivity (NDO) after spinal cord injury may cause urinary incontinence, urinary tract infection and chronic renal failure. In refractory patients to conservative treatment sacral rhizotomy decreases detrusor overactivity by interrupting the afferent reflex arc, thus increasing storage volume and improving continence. Initially presented in the 1950s, sacral rhizotomy lost popularity due to its associated complications. However, recent reports have demonstrated interesting results after percutaneous sacral rhizotomy in selected patients, with low rates of complications. This study attempts to determine the effects of the percutaneous radiofrequency sacral rhizotomy on the bladder capacity and the detrusor pressure at maximum bladder capacity.

### Study design, materials and methods

Twelve spinal cord injured patients (5 men and 7 women; 22 to 58 years old) were evaluated. Eleven patients had a traumatic complete spinal cord lesion that resulted in quadriplegia (n = 5) or paraplegia (n = 6). One patient had ischemic iatrogenic spinal cord lesion that resulted in paraplegia. The indication for this procedure was refractory NDO with conservative management. The interval between the occurrence of the lesion and the date of surgery was 8 to 96 months (mean 60). All patients underwent clinical and laboratory investigation, as well as evaluation of the upper and lower urinary tract by sonography and videourodynamic study. All patients were also submitted to bilateral anesthetic block of the 3<sup>rd</sup> sacral root using 3 cc of 0.5% bupivacaine hydrochloride instilled into sacral foramen under fluoroscopic control. Thirty minutes after the sacral blocking, a videourodynamic evaluation was performed and the effect on bladder capacity and detrusor pressure was ascertained. The selection criterion was an increase of bladder capacity over 100% of the bladder volume recorded before anesthetic sacral blocking. Four patients were excluded from this study because they did not show a significantly increase of bladder capacity after this procedure. Eight patients underwent a percutaneous radiofrequency sacral rhizotomy. The procedure started with the percutaneous puncture of bilateral 3<sup>rd</sup> sacral foramen under fluoroscopic control using a 22 gauge needle. The bilateral 3<sup>rd</sup> sacral root was initially identified through an electrostimulation using a pulse of 25 ms, 30 Hz and 0,1 V. The voltage was increased until the detrusor contraction was observed or external signs of S3 stimulation could be observed. After this first procedure, a thermocoagulation of S3 roots was performed using the tissue impedance. All patients were evaluated one month, six months and 12 months through videourodynamic study.

### Results

A significant improvement of bladder capacity was observed after 12 months, in six patients (75%). The mean bladder capacity increased from 100,2 mL ( $\pm$  57,1 mL) to 282,9 mL ( $\pm$  133,4 mL),  $p < 0,05$ . The detrusor pressure at maximum capacity reduced significantly from 82,4 cm H<sub>2</sub>O ( $\pm$  31,7 cm H<sub>2</sub>O) to 58,5 cm H<sub>2</sub>O ( $\pm$  27,6 cm H<sub>2</sub>O),  $p < 0,05$  at six months evaluation. At the 12 months evaluation all patients showed return of NDO. Three patients with autonomic dysreflexia showed total relief of the symptoms. One patient presented total resolution of the grade II vesicoureteral reflux after six months and one patient complained of erectile dysfunction. No serious complication was observed.

### Interpretation of results

Percutaneous radiofrequency sacral rhizotomy improved the reservoir bladder functions in 75% of patients during 6 to 12 months.

Concluding message

Percutaneous radiofrequency sacral rhizotomy in selected patients with NDO and/or autonomic dysreflexia is a safe, simple and minimally invasive technique, being an attractive alternative to treat spinal cord injured patients with NDO.

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