

TECHNIQUE MODIFICATIONS OF THE PERCUTANEOUS RADIOFREQUENCY SACRAL RHIZOTOMY. PRELIMINARY STUDY.

Aims of the Study

Detrusor hyperreflexia after spinal cord injury may cause urinary incontinence, urinary tract infection and chronic renal failure. In patients refractory to conservative treatment, the experience to date has shown that sacral rhizotomy decreases detrusor spasticity 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 in specific patient populations that after sacral rhizotomy, the bladder capacity can be increased and continence can be improved. The purpose of this study was to determine the advantages of using a smaller caliber electrode, 22 gauge, in order to perform a percutaneous radiofrequency sacral rhizotomy. Other authors have previously reported the same technique using 14 and 19 gauge electrodes.

Methods

Eight patients (4 men and 4 women) with ages ranging from 22 to 58 years old (mean 37) and presenting spinal cord injury were submitted to percutaneous radiofrequency sacral rhizotomy. Seven patients had a traumatic complete spinal cord lesion that resulted in quadriplegia (n = 4) or paraplegia (n = 3). One patient had ischemic iatrogenic spinal cord lesion, which led to paraplegia. The indication for this procedure was refractory hyperreflexia with conservative management. The interval between the occurrence of the lesion and the date of surgery was 24 to 96 months (mean 63). All patients underwent the usual clinical and laboratory investigation, imaging of the upper and lower urinary tract by sonography, intravenous urography and videourodynamic study. All patients were also submitted to the bilateral anesthetic block of the 3rd sacral root using 2,5 cc 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 was ascertained. The selection criterion was an increase bladder volume above 100% of the bladder volume recorded before anesthetic sacral blocking. The first group was composed by 3 patients and underwent percutaneous radiofrequency sacral rhizotomy using an eighteen gauge electrode. The procedure started with the percutaneous puncture of bilateral 3rd sacral foramen under fluoroscopic control. The bilateral 3rd sacral root was initially identified through an electrostimulation using a pulse of 25 msec., 30 Hz and 0,1 V. The voltage was increased until the detrusor pressure elevated or external signs of S3 stimulation could be observed. After this first procedure, a thermocoagulation of S3 root at a temperature of 70°C, during 3 minutes was performed for each position. The other group composed by these three patients and the five remaining patients underwent percutaneous radiofrequency sacral rhizotomy using a 22 gauge electrode. By using this electrode the temperature during procedure could not be controlled. The electrostimulation technique used was similar to the approach previously cited, but the thermocoagulation was made using impedance of the tissue before and after the procedure. All patients were evaluated 30 days after the percutaneous radiofrequency sacral rhizotomy and the urodynamic parameters were recorded.

Results

Three of eight patients underwent percutaneous radiofrequency sacral rhizotomy using an 18 gauge electrode. Thirty days after the procedure, no clinical and videourodynamic study showing improvements could be observed. These same patients were submitted to a new percutaneous radiofrequency sacral rhizotomy using a 22 gauge electrode. The other five patients also underwent the same procedure. One of the patients showed no improvements in the clinical and urodynamic parameters. Preliminary results after 1 month showed that there was an increase of bladder capacity from 88,1 mL to 355,3 mL and a decrease of the detrusor leak point pressure from 88,6 to 64,1 cm H₂O in seven patients. Four patients with autonomic dysreflexia presented important improvements of symptoms after the procedure.

Conclusions

The authors observe that percutaneous radiofrequency sacral rhizotomy demonstrated better results when using a twenty-two gauge electrode compared to an eighteen gauge electrode. They also report that a smaller gauge electrode showed to be more appropriated during the performance of an electrostimulation as well as for the thermocoagulation of the sacral roots. In selected patients with hyperreflexia and/or autonomic dysreflexia, this procedure is a valuable treatment option. It is a minimally invasive technique and it is an attractive alternative to enterocistoplasty.