

CASE REPORT

Sacral rhizotomy: a salvage procedure in a patient with autonomic dysreflexia

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Study design: Case report.

Objectives: To show the feasibility of sacral deafferentation as a salvage procedure to resolve life-threatening autonomic dysreflexia.

Setting: Paraplegic center in Switzerland.

Method and results: In a patient presenting with acute autonomic dysreflexia leading to cardiac arrest, sacral deafferentation could prevent further episodes of autonomic dysreflexia.

Conclusion: In patients with spinal cord injury, autonomic dysreflexia can be triggered by the bladder even without detrusor overactivity. In these cases, sacral deafferentation may be the only salvage procedure to prevent further serious health problems. Thus, this procedure augments the armamentarium of urologists dealing with patients suffering from spinal cord lesions.

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Introduction

Sacral deafferentation, mostly combined with the implantation of an anterior root stimulator, is an effective procedure to control detrusor overactivity and autonomic dysreflexia in patients with complete spinal cord lesions.¹ As the procedure is irreversible, it is routinely used as an elective procedure if conservative or minimal invasive treatments have failed. We report the use of sacral deafferentation as a salvage procedure in an emergency situation.

Case report

In 1996, a 40-year-old patient with traumatic quadriplegia sub C6, ASIA score A, since 1975, came to our department for treatment of lower urinary tract dysfunction. He voided by bladder percussion. Urodynamic evaluation revealed a detrusor-sphincter-dyssynergia, and external sphincterotomy was performed. Owing to catheter obstruction, the patient developed a seizure caused by massive autonomic dysreflexia (blood pressure 250/110 mm Hg) on the day after surgery. Since that time, he emptied his bladder by triggered voiding without further problems. In March 2009, the patient came to our emergency room because of acute urinary retention leading to massive autonomic dysreflexia

(blood pressure 230/130 mm Hg). When a urethral catheter was inserted, the patient developed a cardiac arrest leading to cardiopulmonary resuscitation using vasopressors. For bladder management, triggered voiding could not be achieved, and both transurethral or suprapubic catheterization led to dramatic hypertensive episodes. Video-urodynamic testing showed detrusor areflexia. A bladder volume of 180 ml caused autonomic dysreflexia in the absence of detrusor activity and despite normal detrusor compliance. After insertion of an epidural catheter, urinary diversion with a suprapubic catheter was tolerable for some days.

After discussion of the different treatment options, the patient opted for a permanent solution for the life-threatening dysreflexia. However, he did not want to receive any implant. Therefore, a laminectomy of the L4 and L5 vertebrae and bilateral intradural rhizotomy of the sacral roots S2 to S5 without implantation of an anterior root stimulator was performed.

Postoperative course was uneventful; the patient was discharged with a suprapubic catheter, as he elected not to perform intermittent catheterization.

At a follow-up examination 3 months after surgery, the patient was content with his situation. Since discharge from the hospital, no episodes of autonomic dysreflexia had occurred. Bowel evacuation did not cause significant problems. Using the suprapubic catheter was convenient for him, and therefore he did not want to start intermittent catheterization. No symptomatic urinary tract infections had been recognized. Urodynamic examination revealed

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an areflexic bladder with normal compliance. Neither urodynamic testing nor provocative maneuvers (bladder percussion) could provoke a rise in blood pressure (95/45 mm Hg throughout the entire procedure).

Discussion

Sacral deafferentation/rhizotomy is a well-documented surgical procedure to suppress detrusor overactivity and autonomic dysreflexia in patients with spinal cord injury. Initial clinical results have been published more than 30 years ago.² Owing to the invasiveness of the procedure, however, merely a small percentage of patients elect to undergo this surgery. Moreover, only patients with complete lesions are candidates for rhizotomy. Therefore, this procedure is usually performed if conservative (for example, antimuscarinic treatment) or minimal invasive (for example, intradetrusor botulinum A toxin injections) therapies were not effective. It is regarded as the last option before urinary diversion.³

To our knowledge, the use of this procedure not as an elective surgical intervention but as a salvage procedure in an emergency situation has not been reported earlier. In our case, lower urinary tract dysfunction caused severe complications several years earlier, and now resulted in life-threatening complications that could not be prevented by conservative means. As autonomic dysreflexia occurred despite an areflexic detrusor, further suppression of bladder activity did not seem feasible.

Usually, rhizotomy is combined with the implantation of an anterior root stimulator, which can be used for voiding, bowel evacuation, sexual function and possibly for the prevention of pressure sores.^{1,4} In selected patients, sacral deafferentation without implantation of an anterior root stimulator has been proven to be clinically useful as well.⁵ If patients decide to undergo rhizotomy without receiving a

stimulator, bowel evacuation and erectile function may become a problem, as reflex activity can be impaired by surgery. In our patient, defecation was possible without major clinical problems, and he was not concerned by the loss of erectile function.

Conclusion

Sacral deafferentation is an effective surgical procedure to safely control severe autonomic dysreflexia unrelated to detrusor overactivity in patients with neurogenic lower urinary tract dysfunction. Thus, this method can be used as a salvage procedure if autonomic dysreflexia is leading to life-threatening complications, and therefore augments the armamentarium of urologists dealing with patients suffering from spinal cord lesions.

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