



Mutual influence between vesicourethral and anorectal function in spinal cord injury patients

R Carone, M Petrillo, D Vercelli and P Bertapelle

Department of Urology, Spinal Cord Injuries Centre, Osp. C.R.F. str. San Vito 460, 10133 Torino, Italy

There is clinical evidence of a relationship between urethrovesical and anorectal dysfunction in spinal cord injured patients. This study was performed to assess how rectal distension could influence the results of urodynamic investigations. Ten patients with spinal cord injury were submitted to repeated urodynamic evaluations under different rectal conditions after performing complete anorectal testing. Distension of the rectal ampulla may interfere with vesicourethral function in spinal cord injured patients: in those with complete spinal cord lesions rectal distension causes a reduction in bladder compliance, earlier and higher amplitude of the first hyperreflexic contraction, and an increase in detrusor–external urethral sphincter dyssynergia. We suggest that urodynamic evaluation of spinal cord injured patients should not normally be performed if the patient has a full rectum.

Keywords: spinal cord injury; vesicourethral function; anorectal function

Introduction

While many studies of vesicourethral dysfunction have been performed in spinal cord injured patients, anorectal function has not been well documented and intestinal rehabilitation is not routinely performed in many spinal cord injury centres. More than 10 years ago, Maury¹ pointed out that it was illogical to evaluate neurologically paraplegic and tetraplegic patients, without also evaluating intestinal function. Much has been written about anatomical and functional analogies between the urinary bladder and rectal ampulla, the bladder neck and internal anal sphincter, and particularly between the external urethral sphincter and the external anal sphincter.^{2–4} Comparisons can also be made regarding functional alterations in the anorectal and vesicourethral apparatus. Alterations of filling function lead to faecal and urinary incontinence and voiding alterations result in constipation and retention of urine.²

Materials and methods

Ten spinal cord injured patients with an upper motor neuron lesion were studied: eight males and two females, seven with complete lesions and three with incomplete lesions. Firstly a complete videourodynamic study was performed after stool evacuation; during this first evaluation we considered bladder compliance, the presence of hyperreflexic contractions, bladder filling volume and maximal bladder pressure at first reflex contraction and the presence of detrusor–external sphincter dyssynergia. Thereafter we performed complete anorectal testing, with a needle electrode still in place in the urethral striated

sphincter.² Anorectal testing consisted of three different stages; in the first stage progressive filling of a rectal balloon was performed at the rate of 40 ml water min⁻¹. During this stage we evaluated ampullar compliance, sensitivity and rectal activity during external anal sphincter stimulation. In the second stage rectal distension was achieved by repeated sudden inflation of 50 ml air, and the electromyographic (EMG) activity of the external anal sphincter and/or of the urethral striated sphincter were recorded: reflex external anal sphincter contraction and increased or inhibited electrical activity during rectal distension were noted. During the third stage an anal pressure profile was performed, evaluating maximal anal closure pressure and rectoanal inhibitory reflex. At the end of rectal testing, the rectal balloon was filled below maximal ampullar capacity threshold (the filling volume was always less than 200 ml) and a new videourodynamic evaluation was performed.

Results

Modifications in urodynamic parameters following filling of the rectal ampulla were evident in every patient. In complete spinal cord lesions with a hyperreflexic bladder detrusor we observed: (1) a reduction in bladder compliance, (2) earlier and higher amplitude of the first hyperreflexic contraction, (3) an increase in EMG activity of the external urethral sphincter as well as an increase in detrusor–external sphincter dyssynergia (Figure 1). In particular one patient showed a previously undetected detrusor–bladder neck dyssynergia. In patients with an incomplete lesion and a hyperreflexic detrusor, after rectal distension this last changed into detrusor hyporeflexia: the first, weak,

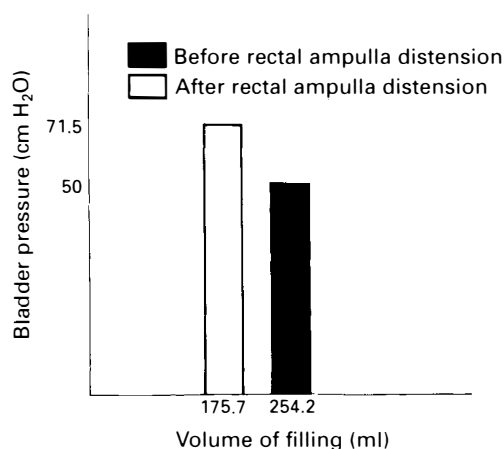


Figure 1 Characteristics of first reflex bladder contraction before and after rectal ampulla distension in seven patients with complete upper motor neuron lesion

contraction appeared at high filling volume (Figure 2). In this group of patients, EMG activity was also reduced.

Discussion and conclusions

Although the present study was suggested by simple clinical observations, our findings spread over the initial aim. Functional modifications in vesicourethral activity following rectal ampulla distension demonstrate the existence of a functional correlation between vesicourethral and anorectal activity in spinal cord injury. Rectal distension induces a reduction in bladder compliance in patients with complete lesions and a reduction in bladder reflex activity in those with

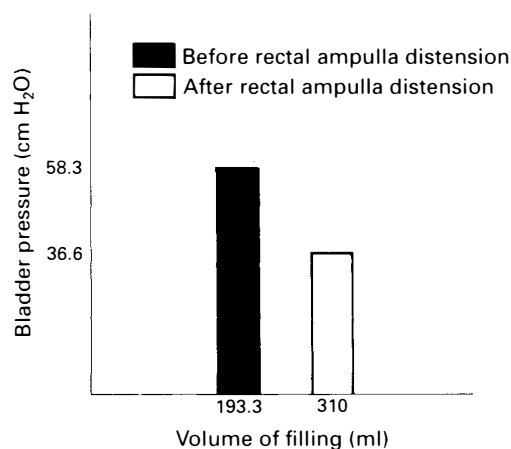


Figure 2 Characteristics of first reflex bladder contraction before and after rectal ampulla distension in three patients with incomplete upper motor neuron lesion

incomplete lesions. We suggest that urodynamic evaluation of spinal cord injured patients should not normally be performed with a full rectum.

References

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