

SIGNIFICANCE OF RECTAL CONTRACTIONS DURING URODYNAMIC STUDIES

Hypothesis / aims of study

Various types of rectal contractions are known to occur in human rectum in nature (1, 2). These contractions have been described in the gastroenterology literature. It is not rare that rectal contractions isolated from detrusor activity are shown in multichannel urodynamic study. However little attention has been paid to these rectal activities that affect the value of subtracted detrusor pressure. The aim of this study was to investigate features of rectal contractions shown in urodynamic studies and to clarify the relationship to neurological and urological background.

Study design, materials and methods

We reviewed a total of 296 consecutive patients who underwent multichannel urodynamic recordings including filling cystometry and pressure flow study conducted between 2006 and 2009 in our institute. Filling cystometries and measurements of abdominal pressure were conducted according to the ICS recommendations. Patient characteristics including a history of neurological disorder (ND), prostatic volume measured by ultrasonography, International Prostate Symptom Scores (IPSS), quality of life (QOL) index, and urodynamic parameters were reviewed from patient records. Rectal movements independent of intravesical pressure changes were divided into following 3 types; 1. Phasic contractions: rhythmic changes in the abdominal pressure of more than 3 cmH₂O maintained for at least 30 sec. 2. Single contraction: solitary isolated contraction with amplitude more than 3 cmH₂O. 3. Change of tone: slow change of abdominal baseline pressure.

Results

Mean age of the patients was 60.1 ± 1.3 years. There were 223 males and 73 females. Of the 296 patients, ND was noted in 113 patients (38%). Rectal movements during filling cystometry were shown in 78 patients (26%), of whom ND was noted in 40 patients (51%). Phasic contractions were most predominant rectal movements and shown in 43 patients (15%), followed by change of tone in 24 (8%) and single contraction in 11 (4%). Among patients with vs without ND, the incidence of phasic contractions, change of tone, and single contraction was 24.7% vs 8.2%, 7.1% vs 8.7%, and 3.5% vs 3.8%, respectively (Table 1). Among the patients with phasic contractions, phasic contractions was significantly less frequent (4.5 ± 0.41 /min vs 6.1 ± 0.7 /min, p=0.0398) and amplitude of contractions tended to be larger (7.8 ± 0.95 cmH₂O vs 5.7 ± 1.0 cmH₂O, p=0.1597) in those with ND compared to those without ND. Univariate analysis revealed significant correlations of phasic contractions to a history of ND (p < 0.0001), acontractile detrusor (p=0.0102), low compliance bladder (< 20 ml/cmH₂O, p=0.0443) and age (p=0.0355). There were no significant correlations of phasic contractions to other urodynamic properties, IPSS, QOL index or prostatic volume (Table 2).

Interpretation of results

Several types of rectal contractions that seem to have different origin have been reported (1, 2). In the present study, phasic rectal contractions were most predominant rectal movements during filling phase. The incidence of phasic rectal contractions in patients with ND was about three times as high as those without ND. Furthermore, the property of phasic contractions tended to be affected by the presence of ND. Although the exact mechanism remains to be clarified, the present study indicates a possible interaction between lower urinary tract function and rectal activity. This interaction might be attributable to the proximity of spinal innervation of the lower urinary tract and rectum. Significant correlation between the presence of ND and phasic contractions might imply that the presence of these rectal activities would be helpful to suspect undetected neurological abnormalities in patients undergoing urodynamic study for voiding abnormality. Significant correlations of phasic rectal contractions to acontractile detrusor and low compliance bladder should warrant further studies.

Concluding message

In this study, we showed that phasic rectal contractions observed in multichannel urodynamic studies had a significant relationship to the presence of ND and urodynamic abnormality such as acontractile detrusor and low compliance bladder. Possible link between lower urinary tract dysfunction and rectal activity indicates that rectal contractions during urodynamic study should be analyzed so as to comprehensively understand function of elimination.

Table 1. Emergence rate of rectal contractions in patients with or without ND

	Phasic contractions (%)	Change of tone (%)	Single contractions (%)
ND (+)	24.7	7.1	3.5
ND (-)	8.2	8.7	3.8

Table 2. Univariate analysis of factors affecting emergence of phasic contractions

*Binary variables**

	phasic contractions (No. of patients)		P value
	+	-	
sex			
men	29	192	0.1880
women	14	58	
ND			
+	28	84	< 0.0001
-	15	168	
detrusor overactivity			
+	8	65	0.3065
-	35	186	
acontractile bladder			
+	19	66	0.0102
-	22	182	
low compliance bladder			
+	14	47	0.0443
-	28	194	

*Continuous variables**

	phasic contractions (mean \pm SE)		P value
	+	-	
age	53.6 \pm 4.0	61.3 \pm 1.3	0.0355
FSBF	161.7 \pm 16.0	153.4 \pm 11.0	0.7763
SDV	278.2 \pm 17.0	255.2 \pm 8.1	0.2725
Qmax	11.7 \pm 1.3	13.5 \pm 1.2	0.6313
VE	65.8 \pm 6.9	71.6 \pm 2.1	0.4083
PV	30.0 \pm 5.7	32.3 \pm 1.7	0.6929
IPSS	15.1 \pm 3.3	14.6 \pm 0.8	0.8118
QOL index	4.0 \pm 0.5	4.3 \pm 0.1	0.6187

* Binary and continuous variables were compared using chi-square test for independence and student's t-test, respectively. *Abbreviations* : FSBF, first sensation of bladder filling; SDV, strong desire to void; Qmax, maximum flow rate; VE, voiding efficacy (voided volume/ voided volume + residual volume); PV, prostatic volume

References

1. Kumar D, Williams NS, Waldron D, Wingate DL. 1989 Prolonged manometric recording of anorectal motor activity in ambulant human subjects: evidence of periodic activity. *Gut* 30: 1007-1011
2. Prior A, Fearn UJ, Read NW. 1991 Intermittent rectal motor activity: a rectal motor complex? *Gut*. 32: 1360-1363

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Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes