

## Urodynamic Study in Patients with Myelitis

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**Background:** Voiding disturbance is one of the frequent symptoms of myelitis. Clinical manifestations of urinary disturbance in the patients with myelitis are results of the specific neurological lesion of the spinal cord, but can be varied. To determine the relationship between the neurological spinal cord level and bladder dysfunction, we analyzed the urodynamic studies of patients with myelitis who complained of urinary symptoms. **Methods:** We investigated the urodynamic study in 30 patients with myelitis with urinary symptoms. Neurological examination and spinal MR imaging determined the clinical and radiological spinal cord levels. Urodynamic findings were classified as detrusor hyperreflexia (DH), detrusor-external sphincter dyssynergia (DSD), detrusor areflexia/hyporeflexia (DA) or normal. We analyzed the correlation between the neurological spinal level and urodynamic findings. **Results:** Among the 30 patients, 14 patients were revealed DA, 8 were DH, 2 were DSD, and 6 were normal. Of 22 cervicothoracic lesions, 9 had DA, 7 had DH and 2 had DSD, but 4 had normal urodynamic findings. Four lumbar and sacral lesions had DA. **Conclusions:** The Urodynamic study finding in the lumbosacral lesion revealed DA, but, in those with cervicothoracic lesion are varied including DA, DH, DSD and normal. Urodynamic evaluation may provide more information for management of neurourological dysfunction.

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**Key Words:** Myelitis, Urodynamic study, Spinal MRI

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(urody-  
namic study, UDS)  
hyperreflexia, DH),  
(detrusor - sphincter dyssynergia, DSD),  
(detrusor areflexia, DA)

, sarcoidosis, HIV

UDS

30  
14 , 19 , 11 46±  
(Table 1)

Magnetom Vision spinal 1.5T (Tesla) MRI  
Jupiter 8000 Basic (WIEST, Unterhaching, Germany)

UDS 4  
(Table 2).

5~20 ml/min

1998 1 2001 12

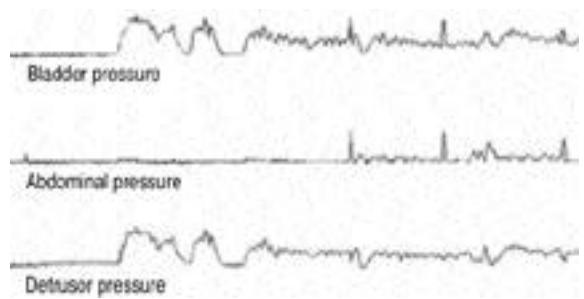
**Table 2.** Voiding difficulty score

- |               |               |   |
|---------------|---------------|---|
| 가 ,<br>level† | (sensory<br>, | 3: Unable to micturate voluntarily<br>2: Marked difficulty in micturition<br>1: Mild to moderate difficulty in micturition<br>0: Normal micturition |
|---------------|---------------|---|

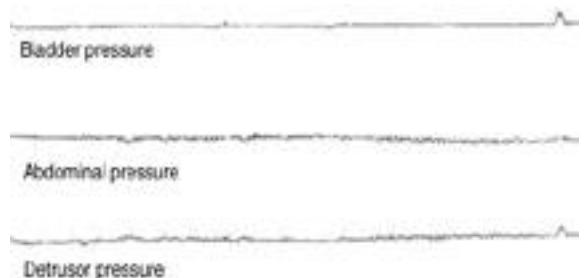
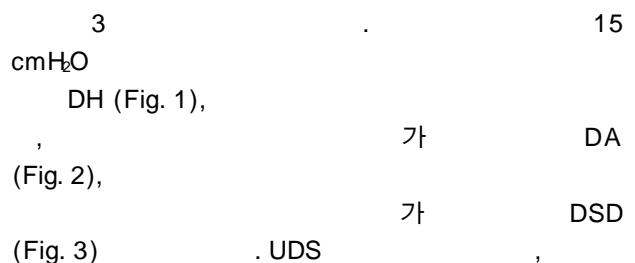
**Table 1.** Summary of clinical feature, UDS type and MRI finding

ID	Sex	Age	LMS	VDS	Sensory level	UDS type	MRI finding
1	Male	29	Mild	1	T4	Normal	C2
2	Male	54	Mild	1	T3	DH	C3~7
3	Female	73	Mild	1	C8	DH	C5~7
4	Male	50	Mild	2	L1	DA	T2
5	Male	38	Mild	2	T6	DA	T2
6	Male	44	Mild	2	T5	DH	T2, T5
7	Male	19	Mild	2	T8	DA	T3
8	Male	49	Mild	1	T10	DA	T3, T4
9	Male	30	Moderate	1	T10	Normal	T3, T8~9
10	Female	50	Mild	3	T4	DH	T3~4
11	Male	42	Mild	1	T5	DSD	T3~4
12	Female	69	Mild	2	T10	DA	T4~12
13	Male	43	Mild	2	T10	DA	T5~6
14	Male	39	Mild	2	T9	DA	T5~7
15	Male	30	Mild	2	T9	DH	T5~8
16	Male	43	Mild	1	T9	DA	T6, T7
17	Male	37	Mild	2	T10	DSD	T8~10
18	Male	37	Mild	1	T11	Normal	T9
19	Female	61	Mild	2	T10	DH	T10
20	Female	63	Mild	3	L4	DA	T11~12
21	Female	59	Mild	2	L1	DH	T11~12
22	Male	54	Mild	2	L1	DA	T11~12, L1
23	Female	13	Mild	2	L1	Normal	T12
24	Female	64	Mild	1	L1	DA	T12, L1
25	Female	68	Mild	3	L4	DA	L3
26	Female	55	Mild	3	S3	DA	S1~3
27	Male	37	Mild	2	T12	DH	Normal
28	Male	48	Mild	1	T11	Normal	Normal
29	Female	53	Severe	2	T10	DA	Normal
30	Male	37	Mild	1	T4	Normal	Normal

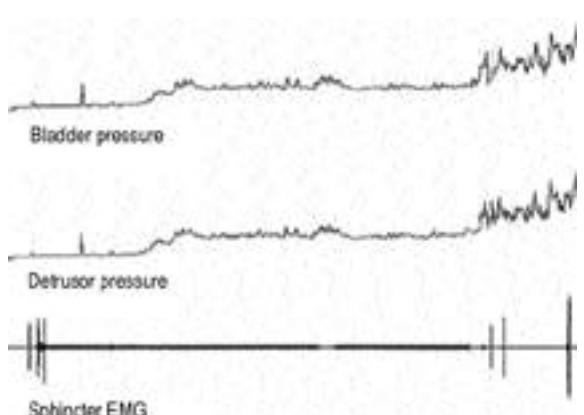
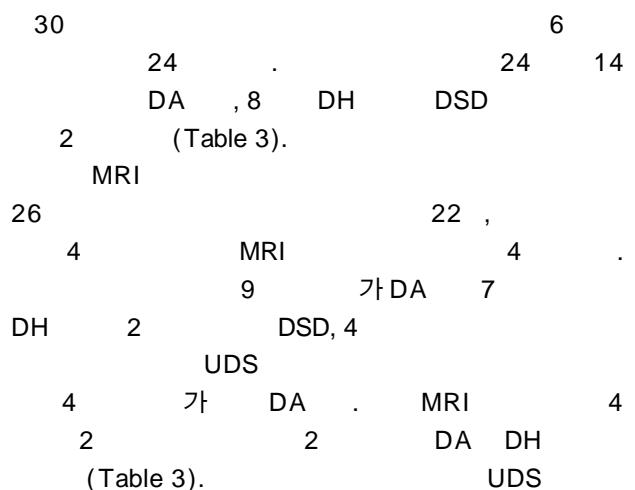
VDS; Voiding Difficulty Score (0; normal, 1; mild to moderate difficulty, 2; marked difficulty, 3; unable to micturition), Lt L/Ex; left lower extremity, Rt L/Ex; right lower extremity, LMS; lower extremities motor score (severe; grade 0-1, moderate; grade 2-3, mild; grade 4-5-), DA; detrusor areflexia, DH; detrusor hyperreflexia, DSD; detrusor sphincter dyssynergia



**Figure 1.** Cystometry finding of neurogenic bladder in detrusor hyperreflexia.



**Figure 2.** Cystometry finding of neurogenic bladder in detrusor areflexia.



**Figure 3.** Cystometry finding of neurogenic bladder in detrusor-sphincter dyssynergia.

(T10~L1) (S2~4)

**Table 3.** Summary of correlation between UDS type and lesion

	Cervicothoracic		Lumbosacral		Normal(%)	Total(%)
	Cervical(%)	Thoracic(%)	Lumbar(%)	Sacral(%)		
DA	0	9(41)	3(75)	1(25)	1(25)	14(47)
DH	2(9)	5(23)	0	0	1(25)	8(27)
DSD	0	2(9)	0	0	0	2(6)
Normal	1(5)	3(13)	0	0	2(50)	6(20)
Total	22(100)		4(100)		4(100)	30(100)

DA: detrusor areflexia, DH: detrusor hyperreflexia, DSD: detrusor sphincter dyssynergia, *P*-value: 0.416; statistically non-significant.



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