

## NEUROGENIC LOWER URINARY TRACT DYSFUNCTIONS AFTER SPINAL VASCULAR DISEASES: URODYNAMIC FINDINGS AND LOWER URINARY TRACT MANAGEMENT

### Hypothesis / aims of study

There have been only few literatures about neurogenic lower urinary tract dysfunctions (NLUTDs) after spinal vascular diseases (SVDs) (1, 2, 3). Therefore, we investigate NLUTDs after SVDs in terms of urodynamic (UD) findings and lower urinary tract management.

### Study design, materials and methods

Of 2,041 patients who underwent UD studies between 1993 and 2009 at our UD center, 34 patients (1.7%) were identified as having NLUTDs after SVDs. We retrospectively reviewed clinical charts on their clinical courses, UD findings, and lower urinary tract management. Differences between groups were analysed with unpaired Welch's t test for continuous variables, and with Chi square test for nominal variables. P-values <0.05 were considered significant.

### Results

The contents of SVDs were as follows: 12 spinal infarcts (SI), 9 spinal arteriovenous malformations (AVM), 5 spinal dural arteriovenous fistulas (DAVF), 4 spinal hemorrhages (SH), and 4 spinal epidural hematomas (EH). AVM and SH were significantly younger than other diseases (p=0.0431). Perineal nociceptive sensation was more preserved than tactile sensation in SI (p=0.0405), which reflected anterior spinal artery syndrome as the major cause of SI. Urine sensation was significantly more preserved in SI and SH (p=0.0151). Detrusor overactivity was significantly more frequently observed in AVM (p=0.0047). Although suprasacral type NLUTDs were expected based on MRI findings, typical UD findings of suprasacral type NLUTDs were not necessarily revealed on UD studies, emphasizing the importance of UD studies. One of the DAVF patients coincidentally developed urinary retention on the day of UD study, despite non-significant postvoid residuals on the day before UD study. UD diagnosis was detrusor areflexia, and normal voluntary voiding was completely resumed after emergent neurological interventions. Clean intermittent catheterization (CIC) was introduced in 62%. ASIA scale at presentation (A and B versus C versus D) was significantly associated with the introduction of CIC (Cochran-Mantel-Haenszel test: p=0.0146). Only 47% of patients received regular urologic follow-up.

### Interpretation of results

To our knowledge, this is the first report about comparison of five different SVDs in terms of UD findings and lower urinary tract management. SVDs were extremely rare (1.7%) at our UD center. NLUTDs on UD studies were not always compatible with MRI findings, and about two thirds of patients needed CIC. In DAVF, urologists might be able to play an important role in the decision of the timing of neurological interventions, because of subacute nature of the disease.

### Concluding message

While urologist should alert neurologists to details of NLUTDs much more, neurologists should be more interested in the condition of NLUTDs, and also more closely collaborate with urologists in appropriate lower urinary tract management and follow up.

### References

1. Gomelsky A et al. J Urol 170; 122, 2003
2. Yasuda K et al. J Urol 150; 1182, 1993
3. Murayama N, et al. Paraplegia 27; 212, 1989

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<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>HUMAN</b>
<b><i>Was this study approved by an ethics committee?</i></b>	<b>No</b>
<b><i>This study did not require ethics committee approval because</i></b>	<b>retrospective clinical review</b>
<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>No</b>