

## Case Report

# Extravasation of the contrast media during voiding cystourethrography in a long-term spinal cord injury patient

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**Objective:** To present complications and pitfalls in voiding cystourethrography (VCUG) and introduce a guideline for performing VCUG in a long-term spinal cord injury (SCI) patient with neurogenic bladder dysfunction (NBD) and contracted bladder.

**Study design:** A case report.

**Setting:** Maharaj Nakorn Chiang Mai Hospital, Chiang Mai, Thailand.

**Method:** We describe a chronic C<sub>5</sub> tetraplegic man with NBD and contracted bladder, who developed autonomic dysreflexia (AD), gross hematuria and extravasation of contrast media during VCUG.

**Result:** A foley catheter was retained after VCUG. AD was resolved and urine cleared after a week of continuous bladder irrigation.

**Conclusion:** VCUG should be performed with caution in a long-term SCI patient with NBD and contracted bladder. Forceful pushing of the contrast media by the hand-injection method caused abrupt distention of the contracted bladder, damaged bladder mucosa and aggravated AD. We suggest a guideline as follows: report bladder capacity and AD, if present, in an X-ray requisition form; use the gravity-drip method, stop the drip and drain the contrast media if a sudden headache and rising of blood pressure (BP) develop; observe urine colour, and report if bleeding or AD occurs.

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## Introduction

Spinal cord injury (SCI) patients usually experience difficulty in emptying the bladder and/or suffer from urinary incontinence. In Thailand, many tetraplegics prefer indwelling catheterization (ID) to intermittent catheterization (IC) for long-term bladder drainage. Unfortunately, those with ID seldom receive bladder relaxants to control uninhibited contractions, and end up with a contracted bladder.

Voiding cystourethrography (VCUG) is recommended in helping to demonstrate abnormalities, for example, complications seen in long-term SCI such as contracted bladder, vesicoureteral reflux (VUR) and urethral stricture. The literature review shows one paper reporting extravasation of the contrast media seen at the voiding phase in a tetraplegic patient with long-term ID,<sup>1</sup> and two other papers that report on anuric patients

with unused bladder prior to renal transplantation.<sup>2,3</sup> These conditions presumably occur because of multiple splits and erosion of the bladder mucosa, and they are asymptomatic and self-limited.<sup>1,3</sup> However, we found such phenomena with bloody urine and autonomic dysreflexia (AD) in a long-term SCI patient. We consider that such complications can be prevented if VCUG is handled properly.

## Case report

A 36-year-old C<sub>5</sub> tetraplegic man had ID for 12 years without taking bladder relaxants. Cystometry showed early uninhibited contractions at a bladder volume of 30 ml. Cystometric capacity was about 90 ml and AD occurred. Kidney ultrasound demonstrated mild hydro-nephrosis with renal stones in the right kidney. VCUG was then requested. It revealed a small bladder with extraperitoneal extravasation of contrast media at the voiding phase, and grade 2–3 of left VUR (Figure 1).

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**Figure 1** During the voiding phase of VCUG, a small bladder with generalized extraperitoneal extravasation of contrast media seen as numerous curvilinear densities radiating out from the bladder contour in a flame-like pattern, and grade 2–3 of left VUR (black arrow) were shown

Gross hematuria was seen while emptying the bladder. The patient developed AD again with high blood pressure (BP) of 240/140 mmHg. A foley catheter was retained and urine cleared after a week of continuous bladder irrigation.

## Discussion

Although previous reports found extravasation asymptomatic, this long-term tetraplegic man with ID and contracted bladder presented gross hematuria and AD. This incident prompted us to seek pitfalls. Without precaution for the contracted neurogenic bladder,

forceful pushing of the contrast media into the bladder by the hand-injection method caused abrupt distention of the contracted bladder, damaged bladder mucosa and aggravated AD.

We, therefore, set a guideline of VCUG for a neurogenic case with contracted bladder as follows:

- report capacity of the contracted bladder and AD, if present, in an X-ray requisition form;
- use gravity-drip method to fill the bladder;
- stop the drip and drain the contrast media if sudden headache and rising BP develop;
- observe urine colour after postvoiding of the contrast media; and
- if bleeding or AD occurs, report it to the attending physician for proper management.

Since we have followed this guideline, there have been no phenomena as previously described or complications seen in our SCI patients with contracted bladder. In addition, SCI patients with long-term ID need bladder relaxants for controlling hyperreflexic detrusor and preventing contracted bladder and damage of the upper tract.

## References

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