

Retrograde cysto-myelogram: Case Report

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Abstract

Background: In the scenario of blunt trauma with suspected bladder injury, conventional retrograde cystography is the gold standard for accurate diagnosis.

Case Description: The authors report the case of a 54-year-old patient who presented with pelvic and sacral fractures and a ruptured bladder after being hit by a vehicle. A retrograde computed tomography cystogram demonstrated extraperitoneal extravasation of the contrast agent, which traversed violated sacral nerve roots, resulting in contrast entering the subarachnoid space at the left sacral ala predominantly through the left L5 and S1 nerve roots.

Conclusions: This is the first known report of an accidental myelogram imaging performed through a retrograde cystogram.

Key Words: Bladder rupture, extravasation, myelogram, retrograde cystogram, sacral fracture

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INTRODUCTION

Pelvic fracture may occur in the setting of severe blunt trauma, particularly with motorcycle accidents.^[3] Current estimates suggest that 8–33% of pelvic fractures occur concomitantly with bladder injury.^[2,5] Patients with bladder rupture often present with nonspecific signs, consisting of lower abdominal pain, dysuria, anuria, and hematuria.^[1] In the scenario of blunt trauma with suspected bladder injury, conventional retrograde cystography is the gold standard for accurate diagnosis. In a retrograde cystogram, contrast agent is passed into the bladder via a Foley catheter.^[6] We present the case of a 54-year-old patient involved in a motorcycle accident who had complex pelvic and sacral fractures and a ruptured bladder. Bladder rupture was diagnosed via retrograde cystography, which demonstrated extraperitoneal extravasation of contrast agent. Furthermore, the contrast

material traversed violated sacral nerve roots, resulting in contrast filling of the spinal canal subarachnoid space.

CASE REPORT

A 54-year-old male was struck by a truck while riding a motorcycle and consequently impacted a guardrail. He was reportedly conscious, ambulatory, and unable to bear weight on his left leg at the scene. His pelvis was temporarily stabilized at an outside hospital, and he was transferred to our facility. A pelvic X-ray and a computed tomography (CT) scan of the chest, abdomen, and pelvis from the outside hospital demonstrated diastases of the left pubic symphysis and a fracture involving the left sacral wing extending to the left sacroiliac joint and a ruptured bladder. On arrival, he underwent a retrograde cystogram during Foley catheter placement, which demonstrated extraperitoneal bladder rupture.

The patient underwent an additional CT scan with contrast enhancement of the chest, abdomen, and pelvis with reconstructions of the thoracic and lumbar spine. At the same time, a CT scan of the head and cervical spine was performed. The images demonstrated extensive hyperdensity within the spinal canal subarachnoid space related to extravasation of contrast material, which was not previously observed on the outside hospital imaging [Figure 1].

The imaging suggested that the contrast material extravasated out of the bladder into the retroperitoneal space [Figure 2]. Because of extensive fracturing of the left sacral pelvic tube with violation of the left sacral nerve roots, the contrast agent entered the subarachnoid space at the left sacral ala predominantly through the left L5 and S1 nerve roots [Figure 3].

The patient underwent emergent repair of the bladder by the urological surgeon, and the pubic symphysis was secured with plates by the orthopedic team. Two days later, the patient underwent open reduction and internal fixation of the left sacrum and percutaneous pinning of the left sacroiliac joint by the orthopedic surgeons. The dural tear and cerebrospinal fluid leak were treated conservatively.

The patient was discharged home 13 days after presentation with family support, physical therapy, wheelchair, and crutches with instructions for no weight bearing on the left lower extremity. On follow-up 3 months later, X-rays demonstrated stable alignment, and on physical examination, he was healing well without complication.

DISCUSSION

This report is the first to demonstrate myelography inadvertently performed via retrograde cystography. Of all mechanisms of blunt trauma, motorcycle injuries are associated with the highest incidence of pelvic fracture. Following the liver, the bladder and urethra are the most common organs injured in fractures of the pelvis.^[3] Moreover, up to 30% of pelvic fractures may result in bladder injury.^[5]

Introduced by Jean-Athanse Sicard and Jacques Forestier in 1921, myelography allows for the visualization of subarachnoid structures within the spinal canal.^[7] Using fluoroscopy, this procedure requires the direct transfer of contrast material into the subarachnoid space via lumbar puncture, and there has been a decline in myelography use in recent years, largely because of the implementation of noninvasive magnetic resonance imaging.

There have been reports of contrast dye entering the subarachnoid space following unrelated contrast-dependent imaging modalities. For example, Gurer *et al.*^[4] reported contrast extravasation through



Figure 1: Saggital CT scan of the thoracic (a) and lumbar (b) spine demonstrating hyperdensity within the spinal canal subarachnoid space



Figure 2: Axial CT scans demonstrating contrast extravasation from bladder into the retroperitoneal space (a) and pelvic fracture with contrast extravasation into the spinal canal (b)

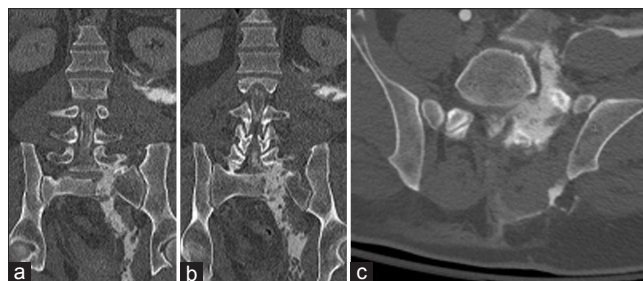


Figure 3: Coronal (a and b) and axial (c) CT scans of the lumbosacral spine demonstrating extensive fracturing of the left sacral pelvic tube, with violation of left sacral nerve roots, allowing contrast to enter the subarachnoid space at the left sacral ala predominantly through the left L5 and S1 nerve roots

a compromised blood–brain barrier after percutaneous coronary intervention in a patient suffering from an acute coronary syndrome. That patient manifested symptoms of contrast-mediated neurotoxicity, whereas our patient had no clinical sequelae, likely because of the low-molecular-weight contrast material used. Furthermore, the means of dye infiltration in the current case was through a dural tear rather than through the alteration in integrity of the blood–brain barrier.

We present this paper to demonstrate the plausibility—albeit, unlikely—of an inadvertent myelogram

following retrograde cystography in a patient with bladder rupture. To the best of the authors' knowledge, this is the first report of its kind. In cases of severe pelvic fractures with bladder injuries, a clinical concern for communication between these spaces should be considered.

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