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Neurogenic Bladders (Series of 3 Cases)

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Abstract | **Case Report**

This study analyzes three cases of neurogenic bladder resulting from traumatic or infectious causes, characterized by severe voiding dysfunction (retention, incontinence) and renal complications, highlighting the importance of early urodynamic screening. Management is tailored to each individual profile, prioritizing the protection of the upper urinary tract to prevent renal failure. For optimal care, the authors recommend early urodynamic screening and a multidisciplinary approach.

Keywords: Neurogenic bladder; Spinal cord injury; Urodynamics; Tuberculous spondylodiscitis.

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INTRODUCTION

Neurogenic bladder refers to a group of bladders and/or urethral dysfunctions resulting from neurological lesions, frequently observed in patients with conditions affecting the lumbar spine that manifest as impairments in urine storage and voiding, significantly affecting patients' quality of life [1].

The underlying pathophysiology, causes, and techniques for preserving vital function are well understood by the scientific community.

Despite this knowledge, clinical management lacks a rigorous consensus and reliable predictive markers.

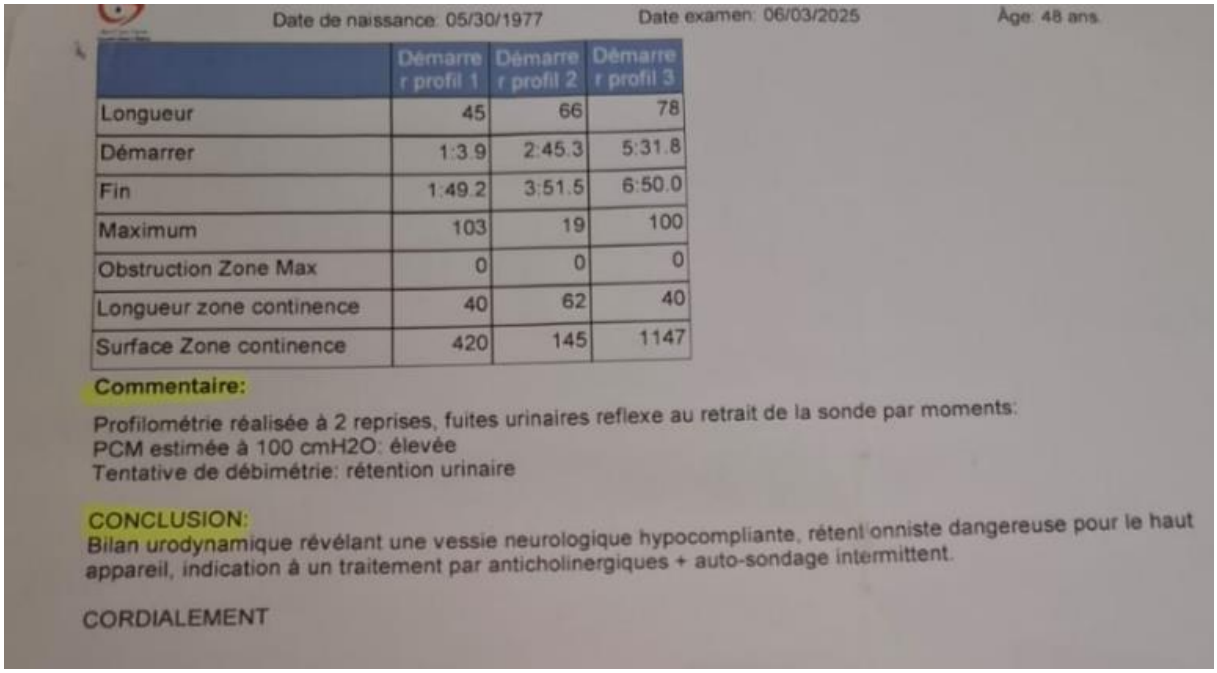
In this study, we report three new cases of neurogenic bladder.

OBSERVATION 1

The patient is a 48-year-old male with a history of chronic constipation for which he has been taking dietary supplements for one year and a T8–T9 laminectomy performed 18 months ago. The latter procedure followed a work-related accident in which a piece of marble fell onto his left leg, resulting in an open injury to the leg and a closed injury to the thoracic spine. Five days after the accident, he experienced the sudden onset of acute urinary retention, paraplegia, and constipation, prompting an emergency consultation; he subsequently underwent bladder catheterization and a thoracic laminectomy. The patient remains catheterized (due to urinary retention following attempts at catheter removal), despite retaining the urge to void; treatment with an alpha-blocker has yielded no improvement. Post-operatively, he has experienced only partial recovery of mobility in both lower limbs and currently walks with the aid of crutches. Clinical examination reveals a performance status score of 2, with urine drained via an indwelling catheter. Neurological assessment shows paraparesis of the lower limbs without hypoesthesia, preserved perineal sensation, and an exaggerated bulbocavernosus (bulbo-anal) reflex. A digital rectal exam revealed anal hypertonia. Urodynamic testing confirmed a neurogenic, poorly compliant, and retentive bladder—a condition posing a risk to the upper urinary tract—along with sphincter hypertonia (maximum urethral closure pressure of 100 cm H2O) (Figures 1 and 2). Following the multidisciplinary team meeting, the decision for this patient was to provide training in self-catheterization—to help manage pain associated with pelvic floor rehabilitation—along with 10 sessions of biofeedback-assisted pelvic floor strengthening.



Figure 1



Date de naissance: 05/30/1977 Date examen: 06/03/2025 Âge: 48 ans

	Démarrer profil 1	Démarrer profil 2	Démarrer profil 3
Longueur	45	66	78
Démarrer	1:3 9	2:45.3	5:31.8
Fin	1:49.2	3:51.5	6:50.0
Maximum	103	19	100
Obstruction Zone Max	0	0	0
Longueur zone continence	40	62	40
Surface Zone continence	420	145	1147

Commentaire:

Profilométrie réalisée à 2 reprises, fuites urinaires reflexe au retrait de la sonde par moments:
PCM estimée à 100 cmH2O: élevée
Tentative de débimétrie: rétention urinaire

CONCLUSION:
Bilan urodynamique révélant une vessie neurologique hypocompliante, rétentionniste dangereuse pour le haut appareil, indication à un traitement par anticholinergiques + auto-sondage intermittent.

CORDIALEMENT

Figure 2

OBSERVATION 2

The patient is a 27-year-old male with a medical history dating back to age 11, when he developed tuberculous meningitis and spondylodiscitis. These conditions were treated with anti-tuberculosis medication but subsequently resulted in thoracolumbar kyphoscoliosis, paresis of the left lower limb (Figure 3), and both urinary and fecal incontinence. He currently manages his condition through clean intermittent self-catheterization four times a day and the use of protective absorbent pads three times a day. Functional rehabilitation was recommended to improve his walking

ability. On clinical examination, his performance status score was 1; findings included normal voiding, the presence of kyphoscoliosis, and paresis of the left lower limb. Neurological assessment revealed infra-umbilical hypoesthesia, saddle anesthesia, an absent bulbocavernosus reflex, and anal atony upon digital rectal examination. A renal and bladder ultrasound showed a "trabeculated" (overactive/straining) bladder with associated bilateral hydronephrosis. Additionally, magnetic resonance imaging (MRI) confirmed the thoracolumbar kyphoscoliosis but showed no abnormalities in the spinal cord signal (Figure 4).

A cystoscopy was performed, revealing a trabeculated bladder indicative of chronic straining with multiple diverticula (Figure 5).



Figure 3

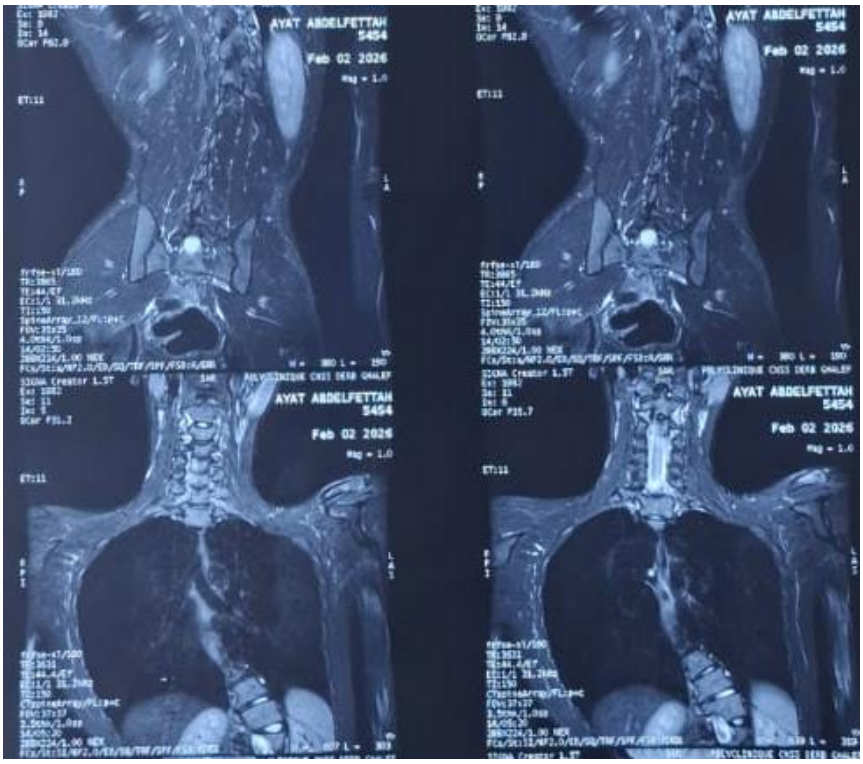


Figure 4



Figure 5

OBSERVATION 3

The patient is a 45-year-old male who was treated for tuberculous meningitis in 2001, receiving an 8-month course of anti-tuberculosis therapy. In 2007, he experienced a recurrence of tuberculous meningitis, which was complicated by tetra paresis. In 2017, he underwent osteosynthesis of both elbows due to skeletal tuberculosis. His current clinical history dates back to 2017, when he developed acute urinary retention, necessitating the placement of an indwelling urinary catheter that requires regular changes; he lacks the sensation of a need to void. He also reports erectile dysfunction, which began concurrently with the urinary retention, though he has no anorectal disturbances. Additionally, a urological CT scan performed in May 2025 revealed the presence of bladder stones. A clinical examination yielded a performance status score of 3 as the patient uses a wheelchair and confirmed the presence of tetra paresis, urinary drainage via an indwelling catheter, and hypoesthesia of the lower limbs. Neurological assessment revealed perineal hypoesthesia (affecting the penis, scrotum, and buttocks), with a preserved bulbocavernosus reflex and good anal tone upon digital rectal examination.

The decision was made to evaluate the patient for either self-catheterization or assisted catheterization, contingent upon an assessment of his manual dexterity (to be conducted following a cystoscopy).

DISCUSSION

Normal micturition requires the proper functioning of the bladder and the urethral sphincters. This process is generally controlled by the central nervous system, which coordinates the activation of the sympathetic and parasympathetic nervous systems with that of the somatic nervous system to ensure normal micturition and urinary continence. Any disruption in this coordination between the central nervous system and the somatic nervous system results in a neurogenic bladder [2].

Benchekroun *et al.,* reported their experience in the management of neurogenic bladders, based on 73 cases. The mean age of their patients was 32 years, with a range of 7 to 98 years. The sex ratio was 2.5: 52 men and 21 women. An analysis of the etiologies revealed a congenital cause in 9 patients (5 cases of spina bifida, 4 cases of myelomeningocele), a traumatic cause in 30 patients (25 cases of thoracolumbar fracture, 3 cases of thoracic fracture, and 2 cases of cervical fracture), a vertebral tumor in 9 patients, and a degenerative cause in 7 patients (2 cases of multiple sclerosis, 5 cases of diabetes). In 13 cases, the etiology could not be determined [3].

The objectives of management are to achieve urinary continence, improve quality of life, prevent urinary tract infections, and preserve the function of the upper urinary tract. The management of neurogenic lower urinary tract dysfunction must address both voiding disorders and issues occurring during the bladder-filling phase; it is guided by the severity of the symptoms and the risk of developing upper urinary tract damage. Adopting an approach that includes the assessment of lower urinary tract symptoms, evaluation of the risk of upper urinary tract involvement, and regular follow-up after the initiation of treatment provides a framework for the practicing neurologist to manage lower urinary tract dysfunction in patients with progressive, non-traumatic neurological disorders. In certain situations, specialized urology services should be involved early in the care of these patients [4].

CONCLUSION

The management of a neurogenic bladder aims not only to restore continence but, above all, to prioritize the protection of the upper urinary tract in order to prevent long-term renal failure.

This case series highlights the importance of systematic and early urodynamic screening in cases of spinal cord compression whether caused by tuberculous spondylodiscitis or trauma to ensure timely treatment of

a neurogenic bladder and prevent irreversible renal complications.

Declaration of interests:
The authors declare that they have no conflicts of interest in relation to this article.

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