Multiple sclerosis (MS) is a chronic and progressive neurological disease with relapsing and remitting features known to manifest in a variety of signs and symptoms. Although the majority of MS patients initially present with neurological symptoms, approximately 3%-10% have accompanying urinary complaints. The majority of these patients, however, develop urinary incontinence or detrusor sphincter dyssynergia, a dysfunction that primarily stems from a neurological disorder or a spinal injury. Very few reports in the literature describe urinary retention as a presenting symptom of MS. In this case report, we describe the diagnostic management of a young man who presented with urinary retention with no obvious etiology.

Case Description

A 33-year-old Caucasian man presented to Greenville Memorial Medical Center’s Emergency Department (GMMC-ED) with acute onset paresthesia on the left side of his face and left upper extremity weakness. Because of suspicion for transient ischemic attack (TIA), he was admitted, evaluated, and discharged home. One week later, he presented to a different hospital with diplopia and vertigo. The patient then returned to GMMC-ED 2 weeks later with urinary retention and right-sided paresthesia to his face. The patient reported several weeks of progressive difficulty urinating, with symptoms including incomplete emptying, urinary intermittency, hesitancy, and straining. He described a normal sensation of bladder fullness, which progressed over several hours to an inability to voluntarily urinate. He denied urgency, frequency, dysuria, hematuria, or incontinence. On physical exam, multiple neurologic findings were noted, including ataxic dysarthria, vertical nystagmus, cerebellar ataxia, and gait ataxia. Upon further questioning, he described difficulty with depth perception and an inability to visually focus on objects. However, when he closed his left eye, his sight improved, and he was able to read and focus without trouble.

Management of Care

During the patient’s initial ED visit, a carotid duplex and echocardiogram were performed, as well as magnetic resonance imaging (MRI), magnetic resonance angiogram (MRA) without contrast, computed tomography (CT) scans, and a CT angiography (CTA) of his head and neck. The carotid duplex and echocardiogram revealed no abnormalities. The MRI showed T2 hyperintense signal abnormalities of the central anterior pons slightly left of midline (11.6 x 9.4 mm) and right lateral corpus splenium (5 mm) (Fig. 1). A minute lesion was also noted in the left middle cerebel-
Urinary Retention Secondary to MS Lesions

Lar peduncle on T2 imaging (8.5 mm). Etiology of the lesions was unclear, but vascular versus demyelination was suggested. The CT scan was normal, and the only abnormality on MRA was an absent anterior cerebral artery, an incidental developmental anomaly. CTA of the head and neck showed a 1.7 mm aneurysm of the left middle cerebral artery with no other abnormalities. The patient’s lab work was within normal limits.

Three weeks later, when the patient returned with urinary retention and paresthesia, a Foley urinary catheter was placed and a follow-up MRI showed an enlargement of the lesions in the left pons (14 x 15 mm) (Fig. 2). The lesion of his middle cerebellar peduncle was visible on T2 and measured 17 x 17.5 mm. Urinalysis showed 3 to 5 red blood cells but was otherwise normal. Urine culture showed no growth. Cerebrospinal fluid analysis after lumbar puncture revealed oligoclonal bands. These laboratory and radiologic findings, along with his evolving symptoms, bolstered multiple sclerosis (MS) as the most likely etiology.

The patient was subsequently started on IV steroids, and his vision began to improve. He was discharged on a 16-day prednisone taper and instructed to follow-up with urology in 2 weeks. At follow-up, the Foley catheter was removed and a renal ultrasound (US) performed to rule out upper tract abnormalities. US showed normal echogenicity of the kidneys and postvoid residual of 37 mL. The patient was educated on clean intermittent catheterization and started on tamsulosin. Neurology also saw the patient after 2 weeks and started him on glatiramer for the management of MS. At his 6-week follow-up with urology, the patient was voiding well with minimal urinary symptoms. His other MS symptoms were also improving.

Follow-up MRI 4 months later showed stable lesions in both the left anterior pons and the left middle cerebellar peduncle. However, both lesions had decreased signal abnormalities and were mildly smaller in size, with the anterior pontine lesion measuring 11.3 x 10 mm and the middle cerebellar peduncle lesion measuring 10 x 7 mm (Fig. 3, Page 66). At this time, the patient has no urinary symptoms and is continuing to take glatiramer for long-term management of his MS.

Figure 1
Head MRI without contrast performed on initial presentation showing lesion in the left anterior pons (white arrow). Axial T2 weighted.

Figure 2
Head MRI without contrast performed on presentation of urinary retention showing lesions in left anterior pons (white arrow) and left middle cerebellar peduncle (gray arrow). Axial T2 weighted.
Discussion

Multiple sclerosis (MS) is a disease process in which the immune system directs an abnormal response toward the central nervous system (CNS). This immune-mediated attack on the CNS manifests as various signs and symptoms. As a chronic and progressive disease, MS demonstrates remissions and relapses that characteristically disrupt motor and sensory function, as demonstrated in this patient. MS is most commonly diagnosed between the ages of 20 and 50 years and is more prevalent in women. The majority of MS patients present with neurological symptoms; only 3%-10% of these patients present with urinary symptoms as their initial complaint. While most patients with urinary symptoms from MS develop incontinence or detrusor sphincter dyssynergia (DSD), the patient described in this case developed urinary retention without other lower urinary tract symptoms.

While micturition in adults is an autonomic reflex, it is under voluntary control. At certain filling pressures, an important neural signal triggers a change from bladder storage to elimination, after which micturition is able to proceed in a reflex-like manner. This switch is purported to be activated by the pontine micturition center (PMC). Since the PMC is responsible for a key step in micturition, lesions in this region can result in urinary retention. Lesions between the PMC and sacral micturition center typically produce problems with urine storage, bladder emptying, and DSD. There has been very little reported on patients with MS lesions within the pons.

To treat the urinary dysfunction of MS, the underlying cause of the dysfunction must be addressed. Numerous drugs treat the pathophysiologic process behind the disease, as well as the symptoms. This patient was started on steroids at the hospital to treat the acute flare of MS. At his outpatient follow-up with neurology, he was started on glatiramer to manage the disease. Approaching patient treatment as a multidisciplinary team is important for successful MS therapy as the disease course can change with every relapse.

Because MS can affect any portion of the CNS, the presentation will differ based on the location of the lesion. As a result, treatment is dependent on the foci of involvement. Anticholinergics and pelvic floor training are the main therapies for patients with urinary symptoms related to MS. These treatments, however, are only helpful when the symptoms involve detrusor overactivity, urgency, and incontinence and are inappropriate when the patient is experiencing urinary retention. For patients experiencing incomplete emptying or symptoms of retention, α-adrenergic antagonists may be used and can reduce postvoid residual. However, studies on the use of these drugs, specifically in MS patients, are limited.

Patients with components of retention may also benefit from clean intermittent catheterization. The patient in this study had an indwelling catheter placed for his urinary retention. The catheter remained until his 2-week follow-up visit. At that point, it was removed, and the patient and his wife were educated on how to perform clean intermittent catheterization. At his 6-week follow-up, the patient reported no difficulty with micturition and had not been self-catheterizing. The patient had a follow-up visit and MRI at 4 months. As seen in Figure 3, the lesions were still visible, even though his symptoms had improved. This is consistent with the literature, as MS lesions usually decrease in size and intensity on T2-weighted imaging but continue to be seen on MRI and do not dissipate completely.

---

**Figure 3**

Head MRI without contrast performed at 4-month follow-up showing lesions of the left anterior pons (white arrow) and left middle cerebellar peduncle (gray arrow). Axial T2 weighted.
URINARY RETENTION SECONDARY TO MS LESIONS

Conclusion
In conclusion, we present a rare case of multiple sclerosis with a lesion of the pontine micturition center resulting in urinary retention. Although urinary symptoms of MS are typically related to urinary incontinence and overactive bladder, in patients presenting with retention with no obvious etiology, MS should be considered a differential diagnosis.

References