CASE REPORT

Lower urinary tract symptoms: thinking beyond the urinary tract

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SUMMARY

We present a case of a 54-year-old man with progressive lower urinary tract symptoms over 12 months. Physical examination, urinalysis, serum biochemistry and ultrasound of the renal tract were all unremarkable. Flexible cystoscopy was normal. Urodynamic assessment revealed an overactive bladder of unknown aetiology. The patient went on to have an MRI of the lumbosacral spine which showed a spinal cord tumour of the conus medullaris. The patient underwent a laminectomy and resection of the tumour. Histology showed myxopapillary ependymoma of the spinal cord. This case highlights the need to consider the full spectrum of causes, urological and non-urological, in assessing a patient with voiding dysfunction.

BACKGROUND

Lower urinary tract symptoms (LUTS) are a common presenting symptom in adult men and women. In the absence of urinary tract infections, LUTS are most commonly attributed to benign prostatic hyperplasia in men and an overactive bladder in women. However, a wide range of differential diagnoses need to be considered for optimal treatment, including urological and non-urological causes. We present a case of a patient presenting with progressive voiding dysfunction secondary to a spinal cord tumour. This case highlights the need to consider neurological causes within the differential diagnoses when assessing a patient with voiding dysfunction.

CASE PRESENTATION

A 54-year-old man was referred to the urology outpatient clinic with a new onset of progressive LUTS over 12 months. He reported urinary urgency with occasional urge incontinence, daytime urinary frequency, poor urinary stream, nocturia up to seven times a night, straining on bladder emptying and a sensation of incomplete emptying. He was started on an α -adrenergic blocker (tamsulosin 400 μ g daily) by his general practitioner which did not help with his symptoms. His International Prostate Symptom Score (IPSS) was 30/35 for the symptom component (indicating severe symptoms) and 5/6 for the quality-of-life component (indicating that the symptoms were having a severe impact on his quality of life). His background was significant for hypertension, gastro-oesophageal reflux disease, hyperlipidaemia, hypothyroidism and chronic back pain for over 15 years following a motor vehicle accident and previous investigation with a CT scan of the spine had shown no evidence of bony or spinal cord abnormality.

Digital rectal examination revealed a normal anal tone, normal perianal sensation and a small, smooth and clinically benign prostate. Abdominal and neurological examinations were unremarkable with normal lower limb sensation, power and reflexes.

INVESTIGATIONS

Blood investigations revealed normal renal function and liver function tests. Urine dipstick, microscopy and culture showed no evidence of pyuria, haematuria or urinary tract infection. Ultrasound of the renal tract showed a 33 cc prostate with no evidence of hydronephrosis and a postvoid residual volume of 60 mL.

On flexible cystoscopy, he had a normal urethra, wide-open prostatic channel and a normal bladder with no evidence of trabeculation, bladder calculus, cystitis or tumours. He underwent urodynamic assessment to assess his bladder function. This confirmed that his voiding was non-obstructed and demonstrated an unstable overactive bladder with evidence of urinary urge incontinence. He was given advice on reducing caffeine intake and was started on a trial of anticholinergic medication (oxybutynin). In light of the patient's persistent symptoms, an MRI scan was arranged to exclude spinal pathology. Lumbosacral MRI revealed a 4.5 cm $\times$ 2 cm conus medullaris mass almost completely filling the spinal canal at the lumbar vertebrae L1–L2 levels suggestive of a spinal ependymoma (figures 1 and 2). The time from onset of symptoms to diagnosis was approximately 15 months.

Figure 1 Sagittal T1-weighted gadolinium-enhanced, fat-saturated MRI demonstrating an enhancing tumour at the level of L1–L2.

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Figure 2 Sagittal T2-weighted MRI demonstrating a tumour at the level of L1–L2.

TREATMENT

The patient was referred to neurosurgery and underwent laminectomy and resection of the tumour. The procedure was complicated by an epidural haematoma which required neurosurgical evacuation. Histology confirmed WHO grade I myxopapillary ependymoma and a follow-up MRI confirmed the complete removal of the tumour.

OUTCOME AND FOLLOW-UP

On 3-month follow-up, the patient is mobilising with a single-point stick and his voiding pattern has improved, with an IPSS of 25/35 and a quality-of-life score of 3/6. His renal function is preserved. The patient will continue to be followed up in the urology clinic for ongoing management of his neurogenic bladder dysfunction.

DISCUSSION

LUTS are common in men and women with an estimated community prevalence of approximately 20% and can have a significant impact on quality of life.¹ Prevalence is known to increase with age.¹ LUTS refer to a complex of symptoms including storage symptoms (urgency, frequency, nocturia, urge incontinence and stress incontinence), voiding symptoms (weak stream, interrupted stream, hesitancy and straining) and postmicturition symptoms (feeling of incomplete emptying and postmicturition dribbling).² The aetiology of LUTS can be multifactorial and includes a wide range of causes. In order to provide optimal care, the full spectrum of causes should be considered and, if possible, the underlying cause treated. While benign prostatic hyperplasia remains the most common aetiology for LUTS in men, the differential diagnosis includes prostatitis, an overactive bladder, urethral stricture, urinary tract infection, urinary tract stones, urological malignancy and neurogenic bladder dysfunction. Diagnostic workup of a patient with LUTS should include symptom assessment, focused physical examination, urinalysis, assessment of renal function and ultrasound of the renal tract.² Cystoscopy, urodynamic assessment, voiding diary and uroflowmetry may be useful in complex patients or patients with ongoing symptoms following initial management.³ In a patient

with persistent symptoms and non-diagnostic initial urological workup, extravesical causes need to be considered. Neurogenic bladder dysfunction refers to LUTS secondary to any neurological injury that affects bladder afferent and efferent signals and can be secondary to injury to the brain, spinal cord or peripheral nerves.⁴ The type of bladder dysfunction depends on the location and extent of neurological injury. The most common causes of neurogenic bladder dysfunction are stroke, Parkinson's disease, multiple sclerosis, spina bifida and spinal cord injury.⁵ Less common causes include pelvic surgery, autonomic neuropathy secondary to diabetes, disc prolapse and brain or spinal cord tumours. Deterioration of renal function is the most significant long-term complication of neurogenic bladder dysfunction. The aims of treatment are to preserve renal function, manage LUTS including incontinence and improve the patient's quality of life.⁵

Spinal ependymomas comprise 50–60% of all spinal cord tumours.⁶ They are most commonly seen in young and middle-aged adults and have a slightly male predominance.⁷ Spinal ependymomas are classified into three distinct categories by the WHO: myxopapillary ependymoma, classic ependymoma and anaplastic ependymoma. Of these, the classic and myxopapillary subtypes are most common.^{8,9} Classic ependymomas are WHO grade II and generally affect the cervical or thoracic spine, while myxopapillary ependymomas are WHO grade I and almost exclusively occur in the lumbosacral region of the spine arising from the conus medullaris or the filum terminale.¹⁰

Myxopapillary ependymomas generally have an indolent course and are regarded as tumours of low-grade malignancy. They can recur locally but are not known to metastasise. Classically, they are well circumscribed, sausage-shaped tumours and tend to displace or compress rather than infiltrate surrounding spinal cord tissues.¹¹ Low back pain with or without radicular pain, gait disturbance and sensorimotor deficits are the most common presenting complaint.¹² Bladder and bowel dysfunction may be present and tends to occur early in the disease compared with tumours elsewhere in the spinal cord.¹³ There is often a delay to diagnosis of several months to years as symptoms can be non-specific and slowly progressive due to the tumour's indolence and limited infiltrative potential.¹² Plain X-ray and CT are non-diagnostic for ependymoma and findings can often be non-specific. MRI is the optimal imaging modality.¹⁴ Complete surgical resection is the treatment of choice.¹⁵ Complete resection is usually curative with good recurrence-free survival. Adjuvant radiotherapy has been reported to be beneficial and may be considered in patients with residual disease following resection.¹⁶

Learning points

- ▶ Lower urinary tract symptoms can be caused by a wide spectrum of conditions.
- ▶ Non-urological causes should be considered in the differential diagnoses of lower urinary tract symptoms, particularly when initial urological workup is normal.
- ▶ MRI is the imaging modality of choice for assessing the spinal cord.
- ▶ Spinal cord tumours may present with lower urinary tract symptoms with or without other localising symptoms.
- ▶ Voiding dysfunction may be an early symptom of spinal cord tumours affecting the conus medullaris or cauda equina.

LUTS are a common presenting complaint in the community. Clinicians should be aware that spinal cord pathology may present with voiding dysfunction and neurological causes should be considered in patients presenting with LUTS.

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