

Case report

Development of hydronephrosis secondary to poorly managed neurogenic bowel requiring surgical disimpaction in a patient with spinal cord injury: A case report

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Context: Case of an adult patient with paraplegia managing neurogenic bladder with intermittent catheterization who was not performing a standard bowel program for management of neurogenic bowel.

Findings: Patient presented with increasing spasticity, fecal incontinence, and abdominal pain and ultimately was hospitalized for management. Imaging revealed massive fecal impaction, resulting in ureteral obstruction and hydronephrosis. Despite repeated aggressive bowel regimens, serial abdominal X-rays showed continued large stool burden. Ultimately surgical intervention was required to evacuate the colon and subsequently the hydronephrosis resolved.

Conclusion/Clinical relevance: This case illustrates the importance of proper management of neurogenic bowel, as significant medical complications, such as hydronephrosis can occur with poorly managed neurogenic bowel.

Keywords: Spinal cord injury, Hydronephrosis, Neurogenic bowel, Surgical disimpaction

Introduction

Neurogenic bowel is a medical complication resulting from spinal cord injury (SCI) that causes a person to lose the ability to voluntarily defecate due to loss of central nervous control over the bowel. Management of neurogenic bowel is typically with the use of colonic reflexes, dietary modification, stool softeners, motility agents, suppositories/enemas, and/or manual evacuation/stimulation. Well-managed neurogenic bowel is sought in all patients with SCI as it can become a major cause of morbidity.¹ Complications from poorly managed bowel include abdominal pain, worsening spasticity, nausea, vomiting, autonomic dysreflexia, fecal impaction, worsening bladder management from increased abdominal pressure, mechanical obstruction, etc. Hydronephrosis secondary to fecal impaction is one important complication that has been rarely reported in the adult SCI literature; however, a few

cases have been reported in the palliative care, urology, and pediatric literature.²⁻⁷ One case discussed an adult patient with onset of SCI during childhood using reflex voiding for bladder management who developed fecal impaction and was noted to have bilateral ureteral obstruction and hydronephrosis, that resolved after decompression of fecal impaction.² Other cases reported include a stroke patient, a geriatric patient on constipating medications, a pediatric patient, and a patient with hypothyroidism.³⁻⁷ We present a case of a paraplegic male with neurogenic bowel, who had poorly managed versus abandoned bowel program for years leading to fecal impaction and hydronephrosis.

Case report

A 41-year-old man with T5 ASIA Impairment Scale A SCI secondary to a gunshot wound 3 years prior presented to the outpatient clinic with frequent loose diarrhea, worsening spasticity, and abdominal pain. He was not performing a scheduled bowel program at home but did perform intermittent catheterization

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every 6 hours for management of neurogenic bladder with volumes ranging from 250 to 300 cc, and minimal leakage. He had been seen by his primary care physician and started on loperimide for diarrhea. The patient was seen to establish care with an SCI specialist at our institution; during that visit an abdominal X-ray was obtained and showed fecal impaction with an extremely large volume of stool throughout the colon (Fig. 1). Given the magnitude of fecal impaction and failure of outpatient initiation of a standard bowel program, the patient was admitted to the hospital for further workup and management five days later. Screening renal ultrasound (US) showed moderate left-sided hydronephrosis with no renal calculus or mass (Fig. 2); this was not shown on renal US 2 years prior. Cystogram confirmed no vesicoureteral reflux. Diuretic renal scan showed partial obstruction of the left kidney. Computed tomography urogram showed markedly distended rectum with stool displacing the bladder and ureter resulting in partial obstruction. During his hospitalization the patient underwent manual rectal disimpaction and subsequently received serial aggressive bowel programs with oral magnesium citrate followed by large volume soap suds enemas. This process was repeated nearly daily for 2 weeks; however, serial abdominal X-rays demonstrated continued bowel impaction. The patient was then evaluated by Gastrointestinal (GI) Medicine, and recommendation was made to administer one gallon of Go-Lytle orally followed by further large volume enemas. Unfortunately this still did not produce adequate results, and ultimately GI surgery was consulted for



Figure 1 Abdominal X-ray showing multiple stool collections throughout the abdomen.



Figure 2 Coronal view of computed tomographic urogram showing dilated left renal pelvis, large stool collection in rectum.

surgical disimpaction. The surgical procedure involved insertion of a proctoscope into the patient's rectum, followed by instillation of 1.5 litres of Betadine solution into the rectum. The patient was then maneuvered from Trendelenburg to reverse Trendelenburg several times to distribute the solution, and ultimately a large amount of stool was evacuated from the colon. Postoperatively a repeat abdominal X-ray confirmed marked decrease in colonic and rectal stool volume. Throughout the hospital course the patient was educated on the importance of an appropriate bowel program and he was discharged home with oral stool softeners and laxatives and a standard daily bowel regimen that was completed using a mini enema and digital stimulation. Two months later, a follow-up renal US confirmed resolution of left-sided hydronephrosis.

Discussion

Neurogenic bowel is a complication of SCI that can have significant negative impact on quality of life if not appropriately managed, and can also have significant medical impact. It is due to denervation of the bowel resulting from damage to the spinal cord, conus medullaris, cauda equina, or pelvic nerve which can lead to upper or lower motor neuron bowel dysfunction.⁸ Appropriate management depends on the type of bowel dysfunction. Management of the upper motor neuron pattern of neurogenic bowel typically includes the combination of oral medications including stool softeners and stimulants with an appropriately timed bowel program that is performed after a meal to take advantage of the gastrocolic reflex. The actual bowel

program may be performed with the use of suppositories, enemas and/or digital stimulation, and ideally should be completed within a 30–45 minutes time period. Lower motor neuron pattern of neurogenic bowel is typically managed with the use of bulking agents such as fiber, with the goals of producing a firm, formed stool that can be manually disimpacted. Regardless of the type of neurogenic bowel, the goal of the bowel program is to allow the patient to have a planned bowel movement and avoid bowel accidents. For bowel programs that are taking too long to complete, adjustment of medications may be appropriate; however, abdominal massage has also been shown to improve the speed of the bowel program. For patients who cannot achieve adequate control of neurogenic bowel with the use of pharmacological and mechanical interventions there are surgical options including elective colostomy, implantation of electric stimulator units, and irrigation surgeries such as the MACE procedure (Malone antegrade continence enema) that may be appropriate.¹ Two-thirds of patients with SCI have successful bowel management with conservative or pharmacological methods.⁹

In this case, the patient also had neurogenic bladder that was being managed appropriately. Renal failure was previously a leading cause of death in individuals with SCI. Neurogenic bladder is due to injury or disease to the neural control (brain or spinal cord) of the lower urinary tract. Like neurogenic bowel, neurogenic bladder can be classified as upper or lower motor neuron dysfunction which is determined by the location of the injury above or below the conus medullaris, respectively. Ultimately in patients with SCI, obtaining urodynamic studies is crucial for determining proper management. Goals of neurogenic bladder management are to protect the upper urinary tract, maximize independence/social integration, and minimize incontinence and urinary tract infections. Poor management of neurogenic bladder can lead to decreased quality of life, as well as medical complications including chronic urinary tract infections, bladder diverticulae, bladder stones, bladder cancer, hydronephrosis, pyelonephritis, and renal failure to name a few. Methods of bladder management include indwelling foley or suprapubic catheter, clean or sterile intermittent catheterization, or reflex voiding (external catheter applied to penis and constant leakage throughout day) with or without the use of Crede or Valsalva maneuvers. Reflex voiding is no longer preferred due to elevated intravesical pressures which can lead to upper tract complications. Depending on individual factors, pharmacological management with alpha adrenergics, anticholinergics, or botulinum toxin injections

may be necessary, and in some cases surgical intervention such as urinary diversion, sphincterotomy, bladder augmentation, or implantation of electrical stimulation devices may be indicated.¹⁰

From our review of the literature, this is the third case of fecal impaction leading to urinary tract obstruction in a patient with neurogenic bowel and bladder. The previous cases involved a pediatric patient with myelomeningocele and a 19-year-old male with paraplegia since childhood with history of suprapubic catheter as a child but had been reflex voiding since puberty.² Our case is the first in a paraplegic adult as a result of poorly managed neurogenic bowel that ultimately required surgical disimpaction. This case illustrates the importance of a structured bowel regimen and the complications that can arise if not properly managed. It also illustrates the importance of educating the patient about their disease in order for them to educate their providers. This patient had been seen by his primary care physician and started on loperimide when the patient was having loose frequent diarrhea, which may have negatively impacted this patient's course. Diarrhea in a patient with SCI can result from stool obstruction/partial obstruction that allows liquid stool to leak around the obstruction. This case also illustrated the lengths necessary to resolve this patient's dilemma. The patient was admitted to the hospital with aggressive bowel program for 2 weeks, and ultimately required surgical evacuation of his colonic and rectal impaction.

Conclusion

Neurogenic bowel is a condition that can be effectively managed in patients with SCI; however, without significant exposure and education, physicians may not be aware of appropriate management in this population. This case illustrates that this condition deserves attention to not only improve quality of life, but also to prevent medical complications. Education of the patient and their other providers on the management of secondary complications of SCI including neurogenic bowel is important to prevent these unfortunate complications.

Acknowledgment

We would like to acknowledge Michael Y Lee, MD (Chair, Department of Physical Medicine and Rehabilitation, The University of North Carolina at Chapel Hill) for his support of this project.

Disclaimer statements

Contributors The first author, JD, did much of the drafting of the article. The 2nd (TW) and 3rd (HW) authors were involved in the actual case and provided

critical revisions of important intellectual content. All authors approved of the version to be published.

Conflicts of interest There are no conflicts of interest for any of the authors.

Ethics approval No ethical approval was needed as this was a case report and all identifying information about the patient was left out of the report.

Funding None.

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