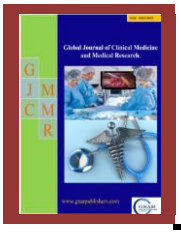

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CHRONIC BLADDER OUTLET OBSTRUCTION: REVIEW OF THE RADIOLOGIC FINDINGS IN A 5 YEAR OLD MALE CHILD: A CASE REPORT

By

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Abstract

Bladder outlet obstruction (BOO) is a blockage that occurs at the base of the bladder causing an impairment to the normal flow of urine. It is regarded as the common cause of lower urinary tract symptoms in both sexes. The incidence of BOO is different and has a variation in both age and gender, although with a male preponderance.

This is a case of a five-year-old male child referred for micturating cystourethrography (MCUG) and retrograde cystourethrography (RUCG) on account of difficult micturition since birth. The RUCG failed following failure of passage of the smallest size catheter raising a suspicion of urethral stenosis. The MCUG however showed a contrast filled urinary bladder with thickened and irregular shaped walls that showed multiple contrast filled outpouches with a contrast filled column between the outpouches and urinary bladder; diverticula having a spoke-wheel appearance. No contrast is demonstrated within the urethra following attempts at micturition. Bilateral grade I vesicoureteric reflux were also demonstrated. Complimentary abdominopelvic ultrasonography showed bilateral moderate to severe hydroureteronephrosis with a thick-walled urinary bladder. Normal abdominal situs was demonstrated. A diagnosis of chronic bladder outlet obstruction following severe urethral stenosis was made.

We report the radiologic features of chronic bladder outlet obstruction following severe urethral stenosis.

Keywords: *Hydroureteronephrosis, Diverticula, Urethra, Stenosis.*

Introduction

Bladder outlet obstruction (BOO) is a urological condition where the urine flow from the urinary bladder through the urethra is impaired with a hallmark of urinary retention which may either be acute or chronic[1].

Bladder outlet obstruction is also defined as the radiographic evidence of obstruction occurring between the bladder neck and the distal urethra in the presence of a sustained detrusor muscle contraction of any magnitude that is usually associated with a reduced or delayed urinary flow rate[2,3].

Bladder outlet obstruction is most frequently due to posterior urethral valve in males and urethral atresia in females. Depending on the severity, infants presenting from birth may have associated respiratory insufficiency from pulmonary hypoplasia and renal failure from renal dysplasia[4,5].

Bladder outlet obstruction has varying causes, these may either be functional or anatomic, and often produces lower urinary tract symptoms (LUTS) of variable degree[6]. However, irrespective of the cause, BOO generally produces compression or resistance on the bladder outflow tract at any level from the bladder neck to urethral meatus[5,6].

Urinary bladder outlet obstruction may also occur entirely without symptoms and often diagnosed in the event of urinary retention or decompensation of the upper urinary tracts[5].

Functional form of BOO is either caused by detrusor-sphincter dyssynergia either at the level of smooth muscle or rhabdosphincter and dysfunctional voiding associated with

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learned voiding disorders or pelvic floor dysfunction associated with pain syndromes[5].

Anatomic form of BOO commonly results from narrowing along the urethra which are mainly from urethral stricture and benign prostatic hyperplasia in men and incontinence procedures in women[2,6].

Irrespective of the cause, BOO produces compression or resistance upon the bladder outflow channel at any point from the bladder neck to the urethral meatus causing a resistance that initiates a bladder response that is quite variable and unpredictable[6].

Bladder outlet obstruction generally presents with obstructive and irritative symptoms, the obstructive symptoms typically manifest as either hesitancy, sensation of incomplete bladder emptying, diminished urinary stream and post voiding urinary dribbling. The irritative symptoms however are urinary urgency, frequency of urination, occasional dysuria and nocturia[5].

There are some forms of complications associated with BOO, most of which are as a result of chronic urinary retention, some of these include urinary tract infection, bladder calculi formation, hematuria, incontinence, erectile dysfunction and damage to bladder wall and kidneys[7].

The diagnosis of BOO is rather crucial, although urodynamic and pressure flow evaluation are regarded the gold standard diagnostic tool, other modalities like the non-urodynamic assessment such as post void residual analysis, urinary flow rates, cystoscopy and specific radiologic procedures like micturating cystourethrogram and ultrasonography may be employed[3,6].

The treatment of BOO depends largely on its etiology, once the cause is well evaluated, the treatment is rather straightforward[8].

Aim

To present a case of chronic BOO with the findings following micturating cystourethrogram in a child.

Case Report

This is a five-year-old male child referred for micturating cystourethrography (MCUG) and retrograde cystourethrography (RUCG) on account of difficult micturition since birth. The patient is the 7th child of his mother aged about 40 years. The patient has had a suprapubic catheter (SP catheter) inserted from birth.

The patient was oriented and conscious, not pale or in respiratory difficulty, not dehydrated and not jaundiced. He appeared to be in slight pain with tenderness from the suprapubic region. The cardiovascular status; pulse rate (90 beats per minute) and blood pressure (95/60mmHg) were normal for his age.

The patient had an elevated blood urea of 23 mg/dL(milligram per deciliter) and elevated creatine of about 2.2 mg/dL at the time of this report.

The patient had MCUG that showed normal bones with an SP catheter insitu following the preliminary film (see figure 1), a contrast filled urinary bladder (contrast was administered through an SP catheter) with thickened and irregular shaped walls that showed multiple contrast filled outpouches with a contrast filled column between the outpouches and urinary bladder; diverticula having a spoke-wheel appearance (figures 2-4). No contrast was demonstrated within the urethra following several attempts and maneuver at micturition. Bilateral grade I vesicoureteric reflux were also demonstrated.

The RUCG failed following failure of passage of the smallest size catheter through the external urethral meatus raising a suspicion of complete and severe urethral stenosis.

Complimentary abdominopelvic ultrasonography was also done and showed bilateral enlarged kidneys with thinning of their cortical mantle, moderate to severe dilatation of the calyceal systems and ureters bilaterally (hydroureteronephrosis) and a urinary bladder that shows reduced luminal capacity with thick and irregular walls. Normal abdominal situs was demonstrated. A diagnosis of chronic bladder outlet obstruction following severe and complete urethral stenosis was established.

The findings of the examinations were given to the patient for onward submission to the referring physician, and was also advised on the importance of an intravenous urography (IVU) to assess the function of the kidneys, and also the possibility of referring the patient to a tertiary centre for definite and better management.

As at the time of this report, the patient did not show-up for the IVU and better management and all efforts to reach the patient proved abortive.

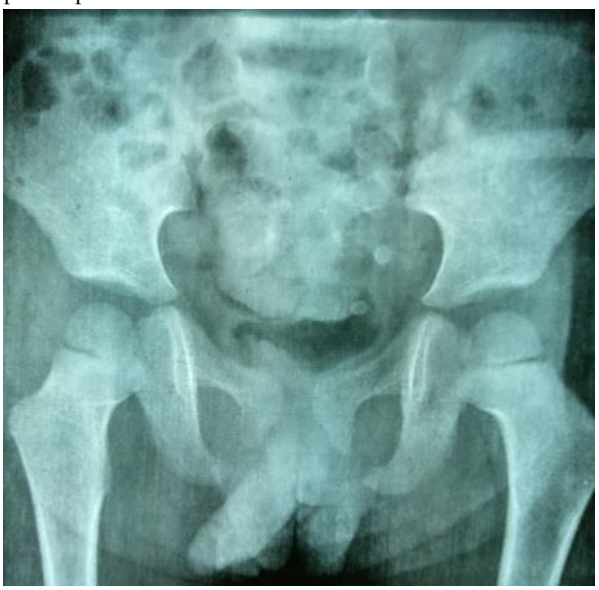

Figure 1: Preliminary film of the MCUG showing normal pelvic bones and normal symphysis pubis. An SP catheter is noted as a tubular radio-opacity.

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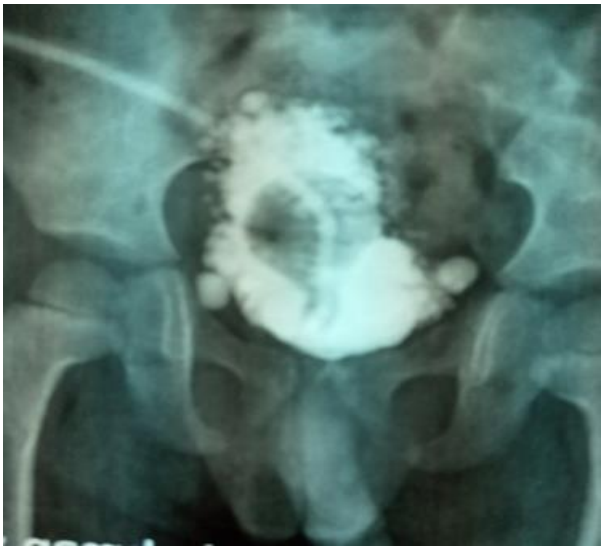

Figure 2: An anterior-posterior view of the contrast series of the MCUG showing a slightly diminished volume and elongated contrast filled urinary bladder with irregular outline and multiple contrast filled outpouches; diverticula having a spoke-wheel appearance. Two oval contrast filled areas are noted on the lateral aspect of the lower urinary bladder; bilateral vesicoureteric reflux. Oval filling defect noted centrally is the balloon of the SP catheter.

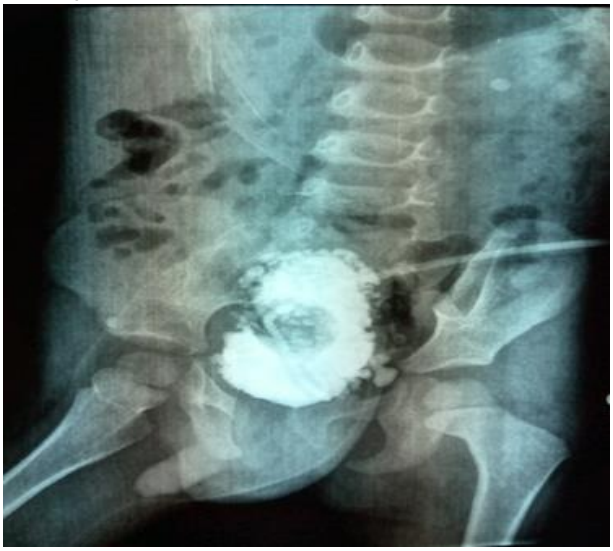

Figure 3: A left lateral oblique view of the contrast series of the MCUG showing a slightly diminished volume and elongated contrast filled urinary bladder with irregular outline and multiple contrast filled outpouches; diverticula having a spoke-wheel appearance. An oval contrast filled area noted on the left lateral aspect of the lower urinary bladder; left vesicoureteric reflux. Oval filling defect noted centrally is the balloon of the SP catheter.

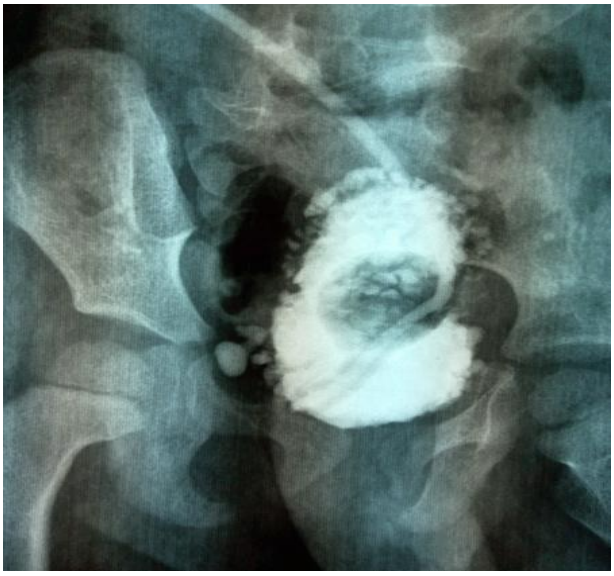

Figure 4: A right lateral oblique view of the contrast series of the MCUG showing a slightly diminished volume and elongated contrast filled urinary bladder with irregular outline and multiple contrast filled outpouches; diverticula having a spoke-wheel appearance. An oval contrast filled area noted on the left lateral aspect of the lower urinary bladder; right vesicoureteric reflux. Oval filling defect noted centrally is the balloon of the SP catheter.

Discussion

Bladder outlet obstruction (BOO) is a urological condition where the urine flow from the urinary bladder through the urethra is impaired with a hallmark of urinary retention which may either be acute or chronic[1]. The index case had hinderance to flow of urine since birth and has been on SP catheter since then, thereby conforming to this literature.

The incidence of BOO is different and varied in both age and gender, but has a male preponderance as reported in most literatures; the index case is a five-year old male child, thereby conforming to most literatures**.**

Bladder outlet obstruction is most frequently due to posterior urethral valve (PUV) in males and urethral atresia in females as documented in the literature[1,2,5,8], the index patient however is not as a result of PUV but rather complete urethral stenosis invariance to these literatures.

Bladder outlet obstruction generally presents with obstructive and irritative symptoms [4,5], some of these symptoms are hesitancy, sensation of incomplete bladder emptying, urinary urgency, frequency of urination, occasional dysuria and nocturia. The index patient however had an SP catheter since birth and presence of these symptoms were however not documented.

Bladder outlet obstruction has varying etiology, these may either be functional or anatomic**,** however, irrespective of the cause, BOO generally produces compression or resistance on the bladder outflow tract at any level from the bladder neck to urethral meatus[4,5]. The cause of BOO in this patient is most

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likely anatomic; complete urethral stenosis thereby agreeing with these literatures.

There are some forms of complications associated with BOO, most of which are as a result of chronic urinary retention[7], the index case had severe urinary retention relieved by insertion of a suprapubic catheter, he also had moderate to severe hydroureteronephrosis, reduced thickness of the renal cortical mantle with altered renal function and bladder wall thickening with multiple diverticulum thereby conforming to this literature.

Non-invasive imaging modalities which include MCUG, RUCG, IVU and ultrasonography play vital role in the diagnosis of BOO with the possible cause and associated complications, these are documented in most literatures. The index case also had ultrasonography and MCUG that confirmed the diagnosis and possible cause of the BOO, agreeing to that documented in the literature.

Though the treatment of BOO is directed at the cause[8], the index case was lost to follow-up and detail about his treatment was not documented.

Conclusion

Bladder outlet obstruction can be diagnosed following ultrasonography and micturating cystourethrogram for possible identification of the cause and associated effects on the urinary tract thereby protecting the subjects from possible obstructive uropathy and nephropathy.

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