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Paediatric Surgery

A RARE CAUSE OF URINARY TRACT INFECTION IN PAEDIATRIC POPULATION

Dr.Prasad Venkata Satyanarayana Gadde — Professor, Department of Paediatric Surgery, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation.

Dr. Manchala Sowmya Catherine* — Postgraduate, Department of General Surgery, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation.*Corresponding Author

ABSTRACT Primary congenital bladder diverticulum is a rare cause of Urinary Tract Infection (UTI). The term bladder diverticulum is usually reserved for the finding of large herniation of bladder urothelium through muscularis propria of the bladder wall. Typically, congenital bladder diverticula are found in smooth walled bladders and are not associated with significant trabeculation on cystoscopic examination.Congenital bladder diverticula have been noted in association with a number of congenital syndromes including Menkes syndrome, Williams syndrome, Ehler-Danlos syndrome and fetal alcohol syndrome.We present a case of Primary congenital bladder diverticulum as a rare cause of UTI in a 4year old male child who was surgically treated.

KEYWORDS : Bladder diverticulum, Urinary Tract Infection(UTI), Congenital anomaly.

INTRODUCTION

Primary congenital bladder diverticula develop as a herniation of bladder mucosa between the defects of bladder smooth muscle fibres. They are usually solitary and most common in males (M:F=9:1) with a peak incidence in those less than 10years of age. They are located lateral and posterior to ureteric orifice often in association with vesicoureteric reflux. Approximately 90% of paediatric or congenital bladder diverticula occur in the vicinity of ureterovesical junction[1]. Common presentation is acute UTI resulting from stasis. Less common presentations are enuresis, pyelonephritis, acute retention and stones [2]. We report a case of primary congenital bladder diverticulum presenting as UTI in a 4 year old male child.

CASE STUDY

A 4year old male child presented to the Paediatric medicine opd with a complaints of pain in the left flank, fever, vomitings for 3 days duration. His haematological(Hb-11.3gm%,TWBC-13,200 cells/mm^3), microbiological(CUE-RBC-1/HPF,WBC-1/HPF,Squamous epithelial cells-1/HPF,Urine culture and sensitivity - No bacterial growth), biochemical(Serum creatinine-0.5mg/dL,Urea-22mg%) and sonological examination was done. On USG abdomen - moderate left hydroureteronephrosis with probable bladder diverticulum was diagnosed and patient was subsequently referred to paediatric surgery opd for further management. Patient was thoroughly evaluated with MCUG, IVU, MR Urogram, Isotope (DTPA) Renal scan, Cystoscopy. MCUG revealed multiple outpouchings arising from the bladder wall(possible diverticula) with significant post void residue , no evidence of VUR/PUV. MR Urogram – left hydroureteronephrosis with bladder diverticulum at left vesicoureteric junction, small diverticulum at right vesicoureteric junction. Cystoscopic examination – no PUV, right side diverticulum of size 1cm seen above and lateral to right ureteric orifice, left side diverticulum of size 1.5cm seen with a wide mouth. Left ureteric orifice is not seen separately. Renal function was assessed by IVU and DTPA renal scan[3]. IVU mild to moderate left hydroureteronephrosis with focal pooling of contrast at anterior border of bladder with significant post void residue. Differential function of left kidney is 49%(slow but adequate drainage –s/o non obstructive drainage pattern). Right kidney-51%, adequate drainage . Open surgical technique with combination of intravesical and extravesical approach was performed under General anesthesia with caudal epidural analgesia supplementation, bilateral bladder diverticulectomy and bilateral Leadbetter - Politano[4] ureteric reimplantation and Starr plication[5] technique for dilated left distal ureter was done. Bilateral ureteric stents were removed on POD-10, foleys catheter on POD-12, SPC serially clamped and removed on POD-14. After removal of Foleys and SPC, patient was voiding spontaneously with good urinary stream. During followup for a period of 1year, patient remained asymptomatic without any lower urinary tract symptoms and had adequate weight gain. His haematological, microbiological and biochemical parameters were normal.

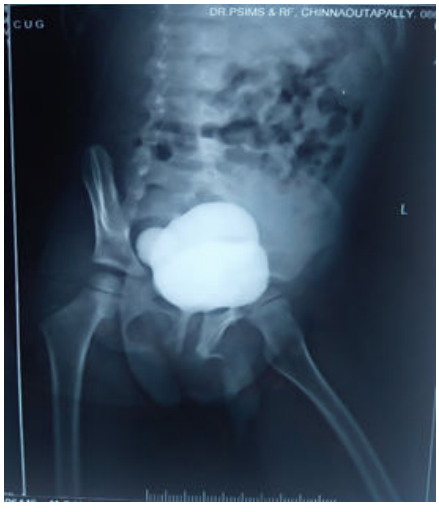

Fig 1: MCUG showing bilateral diverticula - AP View.

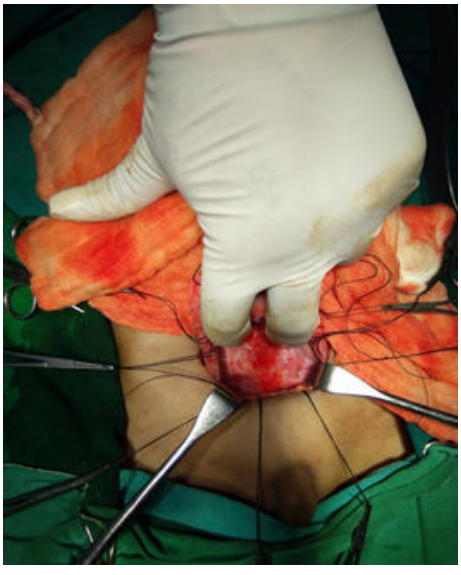

Fig 2: Intravesical-bilateral diverticula openings.

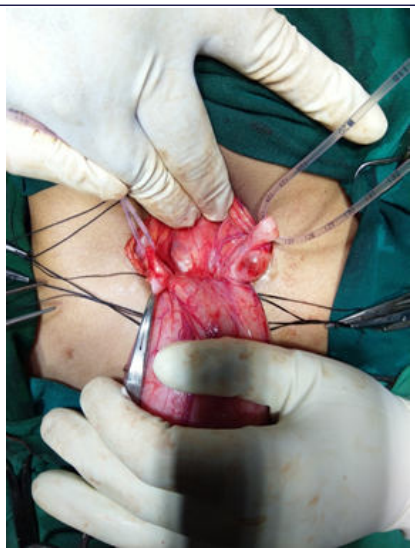

Fig 3: Extravesical-showing bilateral ureters,bilateral diverticular sacs posterior to urinary bladder.

DISCUSSION

Bladder diverticula are classified into congenital (primary) or acquired(secondary). Acquired bladder diverticula develop due to bladder outlet obstruction or neurogenic bladder. Most bladder diverticula are asymptomatic and are commonly discovered during investigation for haematuria, lower urinary tract symptoms or infection. Some can also be found incidentally upon radiographic imaging. In adults , malignancy can be of particular concern with regard to bladder diverticula due to lack of muscular wall beyond the mucosal layer, potentially resulting in increasing risk of extrusion of possible malignancy outside the bladder[6]. Unlike secondary or adult bladder diverticula there is no increased association with malignancy in congenital bladder diverticula. Management options in treatment of bladder diverticula include observation, endoscopic management and surgical excision. Patients with poor bladder emptying following relief of obstruction and who remain symptomatic or those who are unwilling to go for surgical excision may be effectively treated with clean intermittent catheterization(CIC) or an indwelling catheter. Patients who are poor surgical risks because of concurrent medical illness should not undergo surgical excision but may be candidates for CIC or endoscopic treatment. Children with multiple bladder diverticula associated with chromosomal syndrome, observation and medical management are usually preferred because of inherent connective tissue disorders which impair postoperative wound healing, increase perioperative surgical risks and predisposition to recurrence. Bladder divericulectomy is indicated for the treatment of lower urinary tract symptoms that are not otherwise responsive to medical therapy or for the major complications related to it like persistent symptoms, chronic relapsing UTI, stones within the diverticulum , carcinoma or premalignant change and upper urinary tract deterioration as a result of obstruction or reflux[1]. Open surgical technique is the most invasive management modality and can be performed by either transvesical or extravesical approach. The most troubling and potential complication during bladder diverticulectomy is ureteral injury. Other complications are UTI, bleeding , prolonged urinary extravasation postoperatively and urinary fistula. In one small study which compared laparoscopic versus open bladder diverticulectomy, outcomes were similar but notably blood loss and hospital stay were lower in laparoscopic group whereas operative time was almost twice as long(240 vs 136 mins). Robotic diverticulectomies has advantages like improved surgical access and maneuverability in the deep pelvis as well as increased precision, dexterity, visualization in complex reconstructive cases as compared to laparoscopic approach. However robotic surgery is expensive.

CONCLUSION

UTI in a male child should always be evaluated for an existing congenital malformation as often they act as nidus for infection. Urinary bladder diverticula should be ruled out along with PUV and other structural causes especially in males. Outcome is excellent after surgical repair which includes diverticulectomy and ureteric reimplantation.

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