

## IMAGING OF THE COMPLICATED BLADDER EXSTROPHY PRESENTING WITH URETERIC DUPLICATION: A CASE REPORT

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### ABSTRACT

We presented a case of bladder exstrophy in a 7year old child that had primary bladder closure at infancy and ended up with contracted urinary bladder and vesical calculus. This is in addition to unilateral double collecting system and double ureters. The rarity of the association of this condition with upper renal tract anomaly and the imaging diagnosis of the above noted complications was highlighted.

### INTRODUCTION

Bladder exstrophy is defined as a failure of midline fusion of the mesodermal constituents of the infraumbilical anterior abdominal wall, associated with defective development of the anterior wall of the urogenital sinus and the genital tubercle<sup>1</sup>. It is commonly associated with several other congenital anomalies of the lower urinary tract and attempt at surgical closure usually results in complications<sup>1</sup>. Upper urinary tract anomalies are rare in patients with classic exstrophy of the urinary bladder<sup>2</sup>. The imaging demonstration of the complication of this condition and its association with ureteric duplication and duplex collecting system prompted this report.

### CASE REPORT

B.A a 7-year-old girl, presented to the paediatric out patient department of the Aminu Kano Teaching Hospital, Nigeria, with symptoms of recurrent urinary tract infection and poor urinary stream which was managed at the nearby General hospital with several course of antibiotics with no improvement. She was said to have had a lower anterior abdominal wall defect at birth, with a clear colourless fluid dribbling from two lateral orifices into the defect. She was operated upon at

the same hospital (primary bladder closure), and remain asymptomatic post operatively until a year ago when she started having the above symptoms.

Physical examination was uneventful, except for the noted midline infraumbilical scar. Abdominal ultrasound revealed the presence of both kidneys in their normal positions. There was double collecting system with dilatation of both calyceal moieties on the left side. The right collecting systems are within normal limits. The urinary bladder was contracted and contains echogenic curvilinear structure, casting distal acoustic shadow(Figure 1), suggestive of vesical calculus. Intravenous urogram confirms the double collecting system and double ureters on the left side(Fig 2) and also the vesical calculus which showed as as a lucent filling defect(Figures 3). The upper moiety left ureter inserts more medially and ectopically(Figure 3) and the right ureter is dilated.

### DISCUSSION

The original thought, that the underlying defect in patients with the epispadias-exstrophy complex is abnormal persistence or overgrowth of the cloacal membrane during the first six weeks of embryonic life was supported by the earlier experimental work of Muecke, who showed that there is interference in the regression of the normal cloacal membrane with resultant anomaly comparable to exstrophy on the introduction of foreign body in the cloaca of a chick embryo<sup>3</sup>.

In classic exstrophy, there is widening of the pubic symphysis as noted in our case(Fig 3), owing to outward rotation of the iliac and pubic bones. The rectus abdominis muscles are widely separated

inferiorly. The urinary bladder is usually small and lies open and everted on the anterior abdominal wall. The internal genitalia are usually normal. However, a recent study reported the presence of bicornuate uterus and unilateral renal agenesis associated with exstrophy<sup>2</sup>. Similar association was noted in our case with unilateral duplication of the ureter(Fig 2). The lower end of ureters in exstrophy traverse the bladder in an almost perpendicular direction in contrast to their normal oblique intramural course. This, in addition to the ectopic insertion of one of the ureters favours vesico-ureteric reflux and probably responsible for the recurrent urinary tract infection and calculus formation noted in our case(Fig 3),

Surgical therapy by primary closure of the bladder unfortunately often results in diminished capacity of the bladder. Our patient had undergone this type of surgery at infancy stage and ended up with markedly contracted urinary bladder as shown on the intravenous urogram(Fig 3). Factors contributing to successful surgical results in bladder exstrophy include early bladder closure, pelvic osteotomy, adequate bladder neck reconstruction and a motivated child and family<sup>4</sup>.

Calculus formation and recurrent urinary tract infections are complications worthy of note in patients with exstrophy of the bladder, which could also be observed post operatively, just as the rarity of the association of this condition with upper renal tract anomaly, thus emphasizing the importance of imaging follow up evaluation of such cases.



FIG 1. Bladder ultrasound scan, showing vesical calculus presenting as a curvilinear echogenic structure(arrow) with a strong distal acoustic shadow.



FIG 3. Bladder phase of intravenous urogram, showing small capacity bladder containing lucent calculous filling defect (arrow) and terminal insertions of the left double ureters.

## **REFERENCES**

1. George SB, Janet LS, Donald RK. Genitourinary tract. In: Donald RK, ed. Practical pediatric imaging. Little Brown and company, London, 1991; 966-969.
2. Dorairajan LN, Roby G, Kumar S, Singh H, Gowri D. Exstrophy of bladder associated with unilateral renal agenesis and bicornuate uterus: a case report. *Int Urogynaecol J Pelvic floor Dysfunct* 2001; 12(6): 410-411
3. Muecke MC. The role of the cloacal membrane in exstrophy: The first successful experimental study. *J. Urol* 1964; 92: 659
4. Lottman H, Melin Y, Lombrail P, Cendron J. Reconstruction of criteria in favour of the acquisition of incontinence. *Annales d Urologie* bladder exstrophy: retrospective study of 57 patients with evaluation of 1998; 32(4): 233-239