International Journal of Medical Science and Clinical Research Studies

ISSN(print): 2767-8326, ISSN(online): 2767-8342

Volume 04 Issue 02 February 2024

Page No: 211-219

DOI: https://doi.org/10.47191/ijmscrs/v4-i02-10, Impact Factor: 7.949

Coexistence of Ureterocele with a Solitary Kidney in a Nigerian Child: Case Report

Vivian Ndidi Akagbue[1]*, Chidinma Wekhe[2]

[1]Department of Radiology, Rivers State University Teaching Hospital.

[2]Department of Radiology/Senior Lecturer RSU, Rivers State University Teaching Hospital.

ABSTRACT

Ureterocele is a cystic dilatation in the terminal section of the ureter that is located inside the bladder, the urethra, or both. Renal agenesis refers to a congenital absence of one or both kidneys. If bilateral is referred to as classic potter syndrome, the condition is fatal, whereas if unilateral, patients can have a normal life expectancy. Unilateral renal agenesis affects approximately 1 in 500 live births while bilateral agenesis is less common affecting approximately 1 in 4000 live births. There may be a slightly greater male predilection. Radiographic studies have been valuable in diagnosing and confirming diseases in the genitourinary system.

Ultrasonography, intravenous urography (IVU) and computed tomography urography (CTU) has greatly helped in evaluation of patients presenting with renal symptoms/abdominal pains.

Our case study is a 9 years old male child who presented to the Radiology department for abdominopelvic CT scan/computed urography (CTU) on account of recurrent abdominal pains of two years. Previous abdominopelvic ultrasound scan done reviewed a solitary kidney with left ureterocele not in our center. However, the CT scan done in our center showed the left kidney with left ureterocele.

KEYWORDS: Ureterocele, Solitary Kidney, Computed Tomography Urography.

ARTICLE DETAILS

Published On:
07 February 2024

Available on:
https://ijmscr.org/

INTRODUCTION

Ureterocele is a cystic dilatation in the terminal segment of the ureter that is positioned inside the bladder, the urethra, or both.[1] It may be unilateral/one-sided or bilateral/two-sided and may be linked with a single or duplex system in some cases.[2,3] The prevalence is stated to be between 1 in 5,000 and 1 in 12,000 of pediatric hospital admissions,[1]however, a number of autopsy studies have shown a much higher frequency of up to 1 in 500.[2] It is documented that occurrence is 4-6times more frequently in girls and is observed almost exclusively in Caucasian population.[4,5] Ureteroceles have no predilection for side and 10 percent of cases show bilateralism.[4,6]

The cobra head sign is characterized by bulbous dilatation of the distal end of the ureter with a surrounding radiolucent halo, seen within the contrast-filled urinary bladder on intravenous urograms(IVU).[7] The cobra head sign is characteristically seen with an intravesical ureterocele.[2,8]

This type of ureterocele is also termed orthotopic, since it arises from a ureter with a normal insertion into the trigone.[7]

Renal agenesis is a congenital malformation of the kidneys in which there is absence of fetal kidney on one or both sides. Bilateral renal agenesis is incompatible with life and they are either still born or die soon after birth. Unilateral renal agenesis is compatible with life. The unilateral kidney is usually larger due to compensatory hypertrophy. The incidence of unilateral renal agenesis is 1 in 1000 autopsies.[9] Male to female ratio is about 1.8:1.

It may be isolated congenital malformation or may be associated with chromosomal abnormalities or a variety of non-chromosomal syndromes including VACTERL (V-vertberal/vascular, A-anorectal atresia, C-cardiovascular, T-tracheo, E-esophageal fistula±atresia, RL-radial/renal) and MURCS (M-musculoskeletal, UP=urogenital, C-cardiovascular, S-skeletal).[10] There have been reports of ipsilateral genital abnormalities in 20% to 70%of cases renal

agenesis.[11] Genital abnormalities associated with renal agenesis develop more frequently in males than females.[11] Ureterocele coexisting with solitary kidney are rare associations. There is shortage of literature on this rare entity. Moreover, in only 2 of the studies was ureteroceles of the ectopic variant was mentioned. [12,13]

Herein, we present a rare case of a 9-year-old boy with coexistence ureterocele with solitary left kidney in a abdominopelvic CT scan/computed tomography urography (CTU).

AIM/OBJECTIVE

This case report aims to create awareness among physicians and radiologists of the possibility of this rare phenomenon to arise on imaging in vague abdominal pain in a child.

CASE REPORT

Our case study is a 9 years old child who presented to the Radiology department for abdominopelvic CT scan/computed tomography urography on account of recurrent abdominal pain for two years and abdominopelvic scan report of? solitary kidney and left ureterocele from the pediatric nephrology unit of Rivers State University Teaching Hospital. On physical examination, patient's is calm, vital signs were normal and throughout his stay in the CT suite.

The abdominopelvic CT scan/CTU showed Left solitary kidney, with physiological hypertrophy. The morphology of the left kidney is normal(10.02cm). The right renal bed is empty, with no evidence of prior surgery or renal tissue. No calcifications seen in the kidney and ureteric path or bladder.

No mass lesion or cyst seen in the kidney.

It shows prompt contrast uptake and excretion. The pelvicalyceal system is mildly dilated in the superior moiety.

Ureter is normal in course and caliber but dilated at the vesicoureteric junction measuring approximately 2.81x3.51cm.

Urinary bladder is normal in wall thickness. All other abdominal organs are orthotopic, normal in morphology and density.

Images:

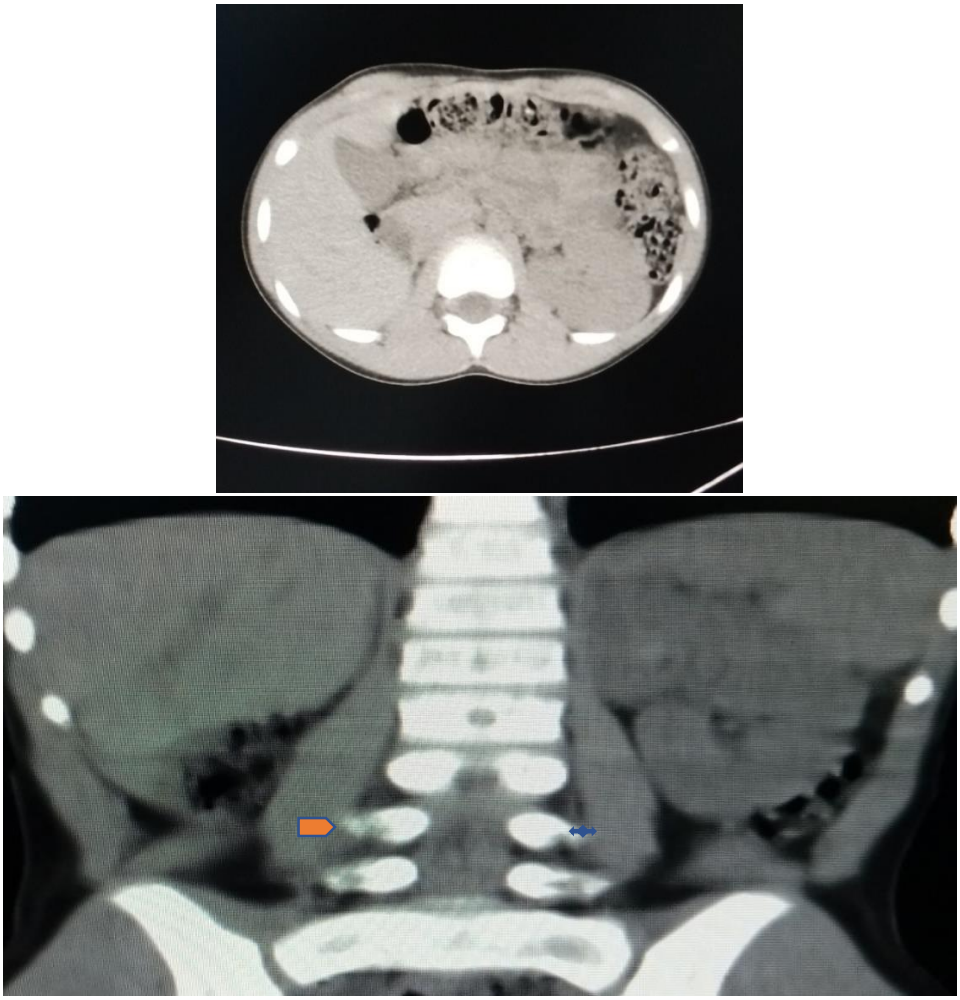


Figure 1a and 1b are axial and coronal reformatted non contrast enhanced computed tomography images showing empty right renal bed (orange arrow head) and the left kidney(blue asteris).

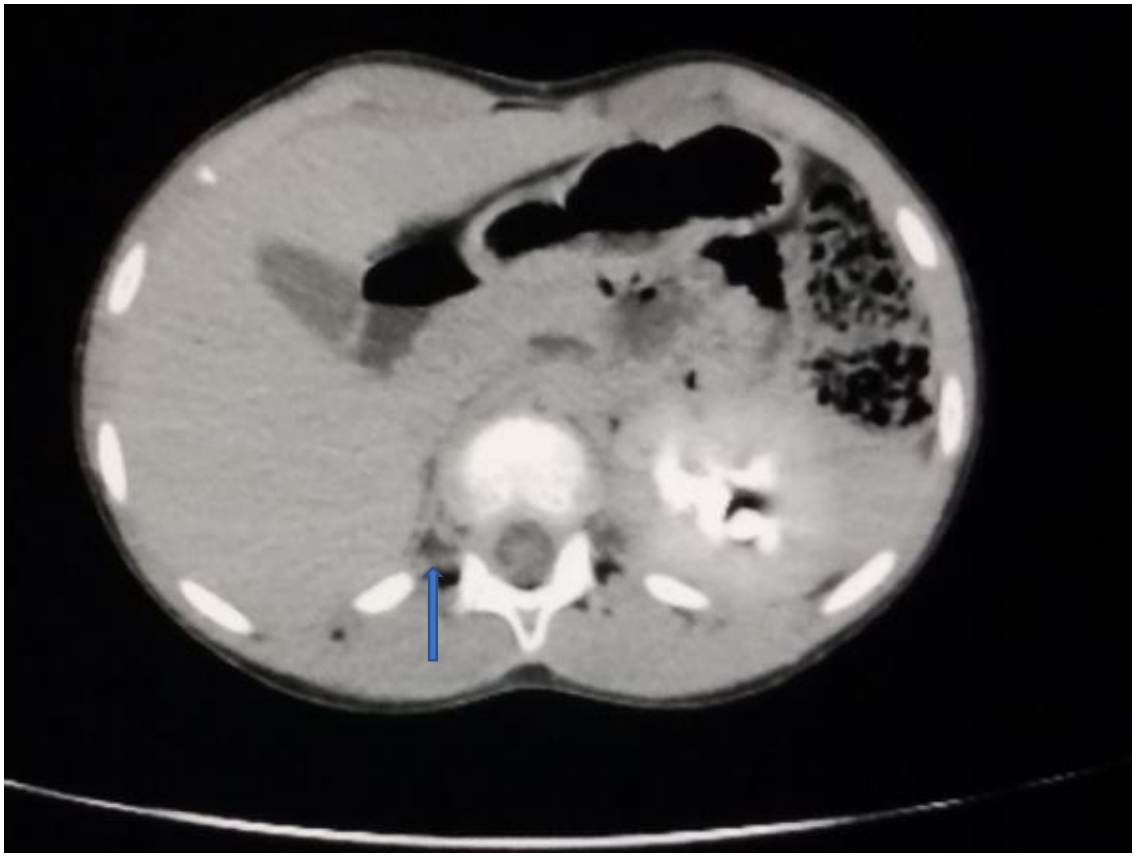


Figure 2 is an axial contrast enhanced computed tomography showing the left kidney that showed uptake and excretion of contrast . The right kidney bed is empty shown by the blue arrow.

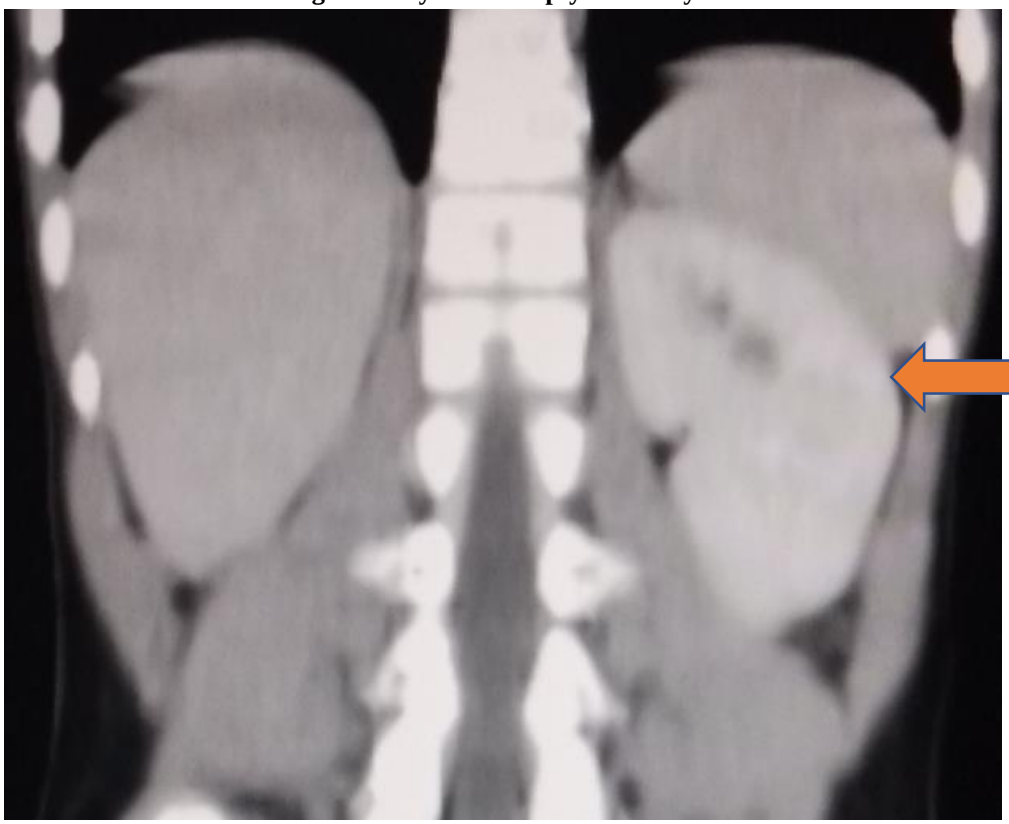


Figure 3 is a coronal reformat contrast enhanced computed tomography image showing the left kidney with prompt uptake of contrast (orange arrow). The right kidney is not visualized.

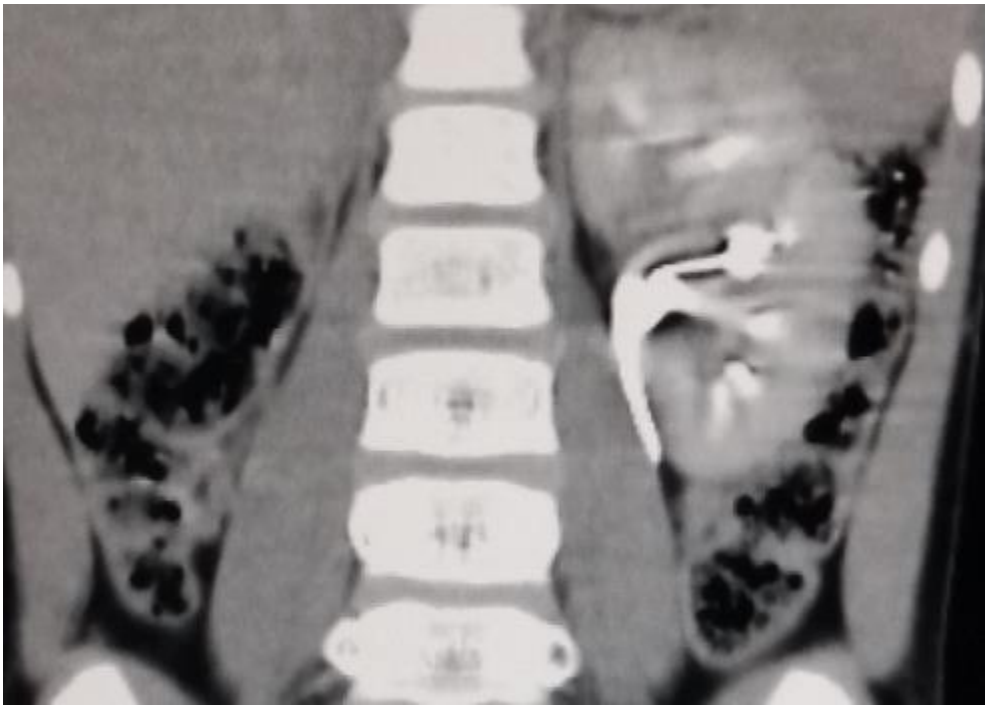


Figure 4 is a coronal reformatted contrast enhanced computed tomography showing the left kidney excreting into the pelvic and the proximal ureter(as shown in the image) and beyond (not shown).

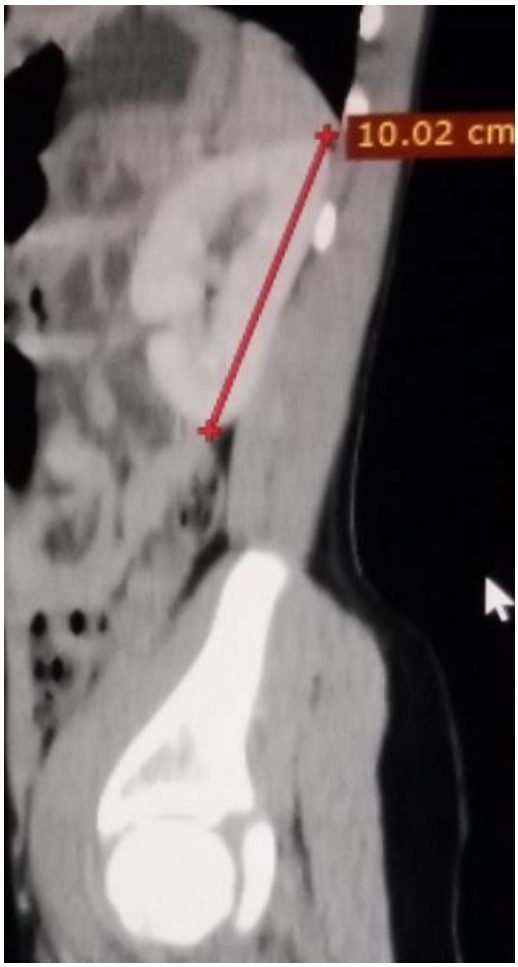
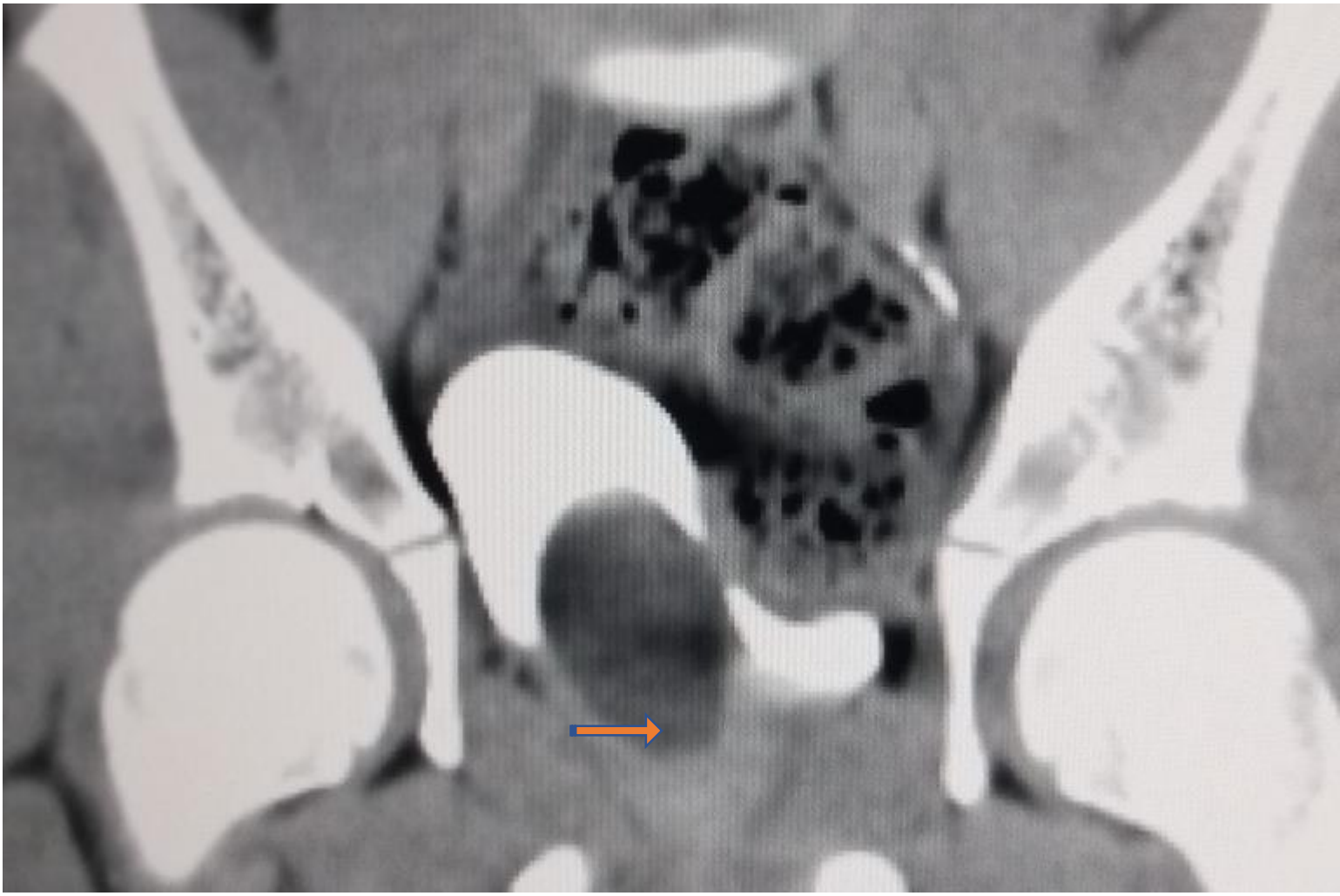


Figure 5 is a sagittal reformats contrast enhanced computed tomography showing the left kidney with its bipolar length measurement.



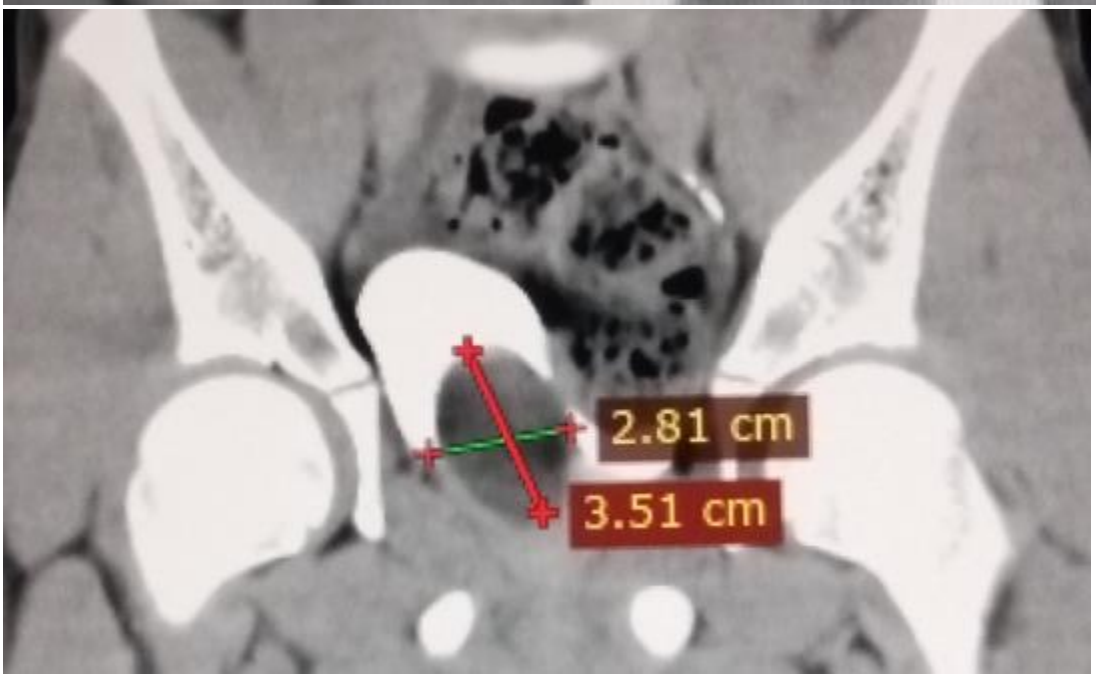


Figure 6a and 6b coronal reformats contrast enhanced computed tomography showing the ureterocele as a filling defect within the contrast opacified urinary bladder(slim orange arrow) with its dimensions.

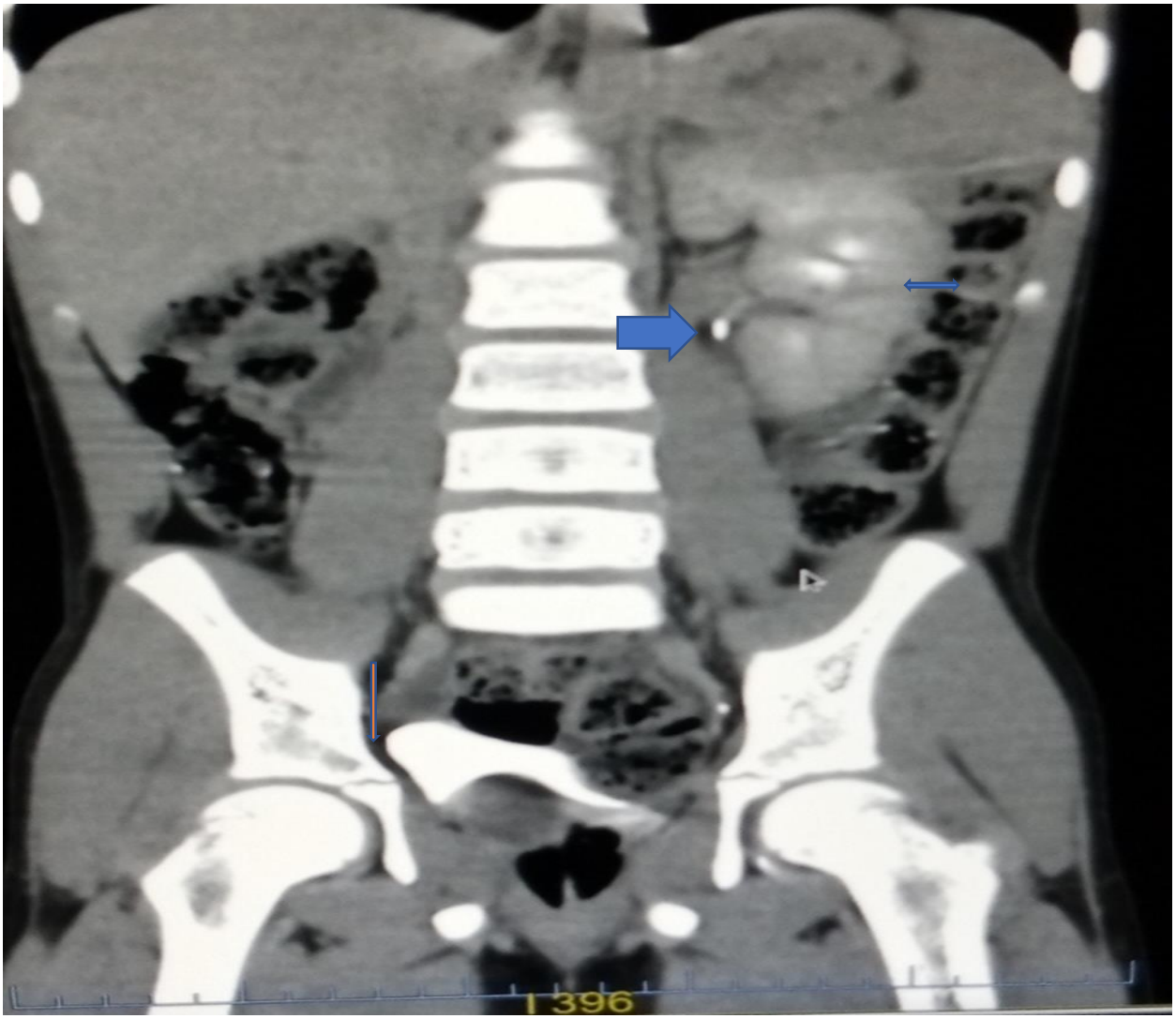


Figure 7 is a coronal reformat contrast enhanced delayed phase image showing the kidney(double edge arrow), part of the ureter(thick blue arrow) and the urinary bladder(slim orange arrow) with a filling defect seen within it.

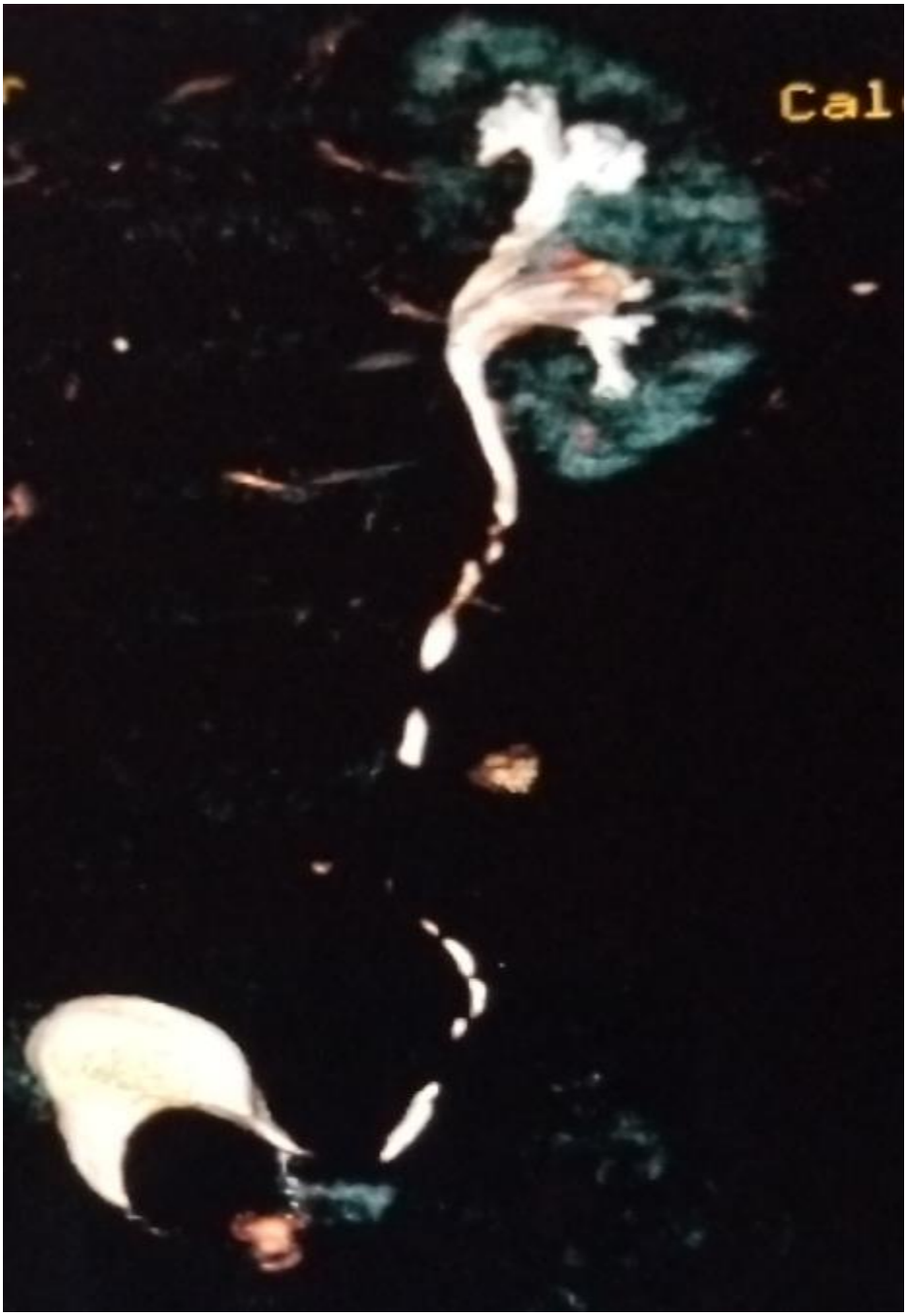


Figure 8 is a volume render image showing the KUB view of the left collecting system with mild dilatation of the superior moiety, the ureter and urinary bladder with the intravesical ureterocele.

DISCUSSION

Ureters are normally implanted in the superolateral angle of the trigone of the urinary bladder. Ureterocele refers to abnormal dilatation of the distal ureter, either entirely within the bladder (intravesical type) or extending into the urethra (ectopic type).[14] Intravesical ureterocele is usually unilateral and supports this current case, since only 10 percent is bilateral.[4,8,15] Most ureteroceles, especially the ectopic ureteroceles are found in conjunction with a duplex collecting system.[16] Unlike renal agenesis/solitary, both ureterocele and ectopic ureter are much common in females.[6,13,17] in addition, ectopic ureterocele is more often diagnosed in childhood.[18] This is in contrast to our case, wherein a male child with intravesical ureterocele with a single urinary collecting system.

Single-system ureteroceles are distinct clinically from the more common duplex-system ureterocele frequently seen in male children.[2] This agrees with the findings in this case report. Conversely, female preponderance in duplex-systems ureterocele and their association with multidysplastic dysplastic kidney. [2]

Our case report is also a single-system ureterocele seen in a male child with a solitary kidney. Literature has it that single-system ureterocele is frequently noted in adulthood, however, in recent years amongst urologists and radiologists in pediatric practice have reported its increasing occurrence .[2,4,15] This case is noted in a 9-year-old male child.

Ureteroceles differ in size ranging from small, clinically asymptomatic lesions to a large lesion, which can obstruct the ipsilateral and contralateral ureters and prolapse into the urethra, causing /triggering bladder outlet obstruction.[3] This patient had unilateral intravesical ureterocele with mild hydronephrosis.

It is worthy of note that no typical clinical picture caused by this condition, nonetheless fever, pyuria and recurrent abdominal pain are habitually present in children.[8]The major clinical presentation/symptom in this patient is recurrent abdominal pain.

This disorder is conventionally diagnosed after urologic assessments prompted by repetitive episodes of a severe urinary tract infection (UTI), although, rarely, urinary obstruction, abdominal pain, palpable abdominal masses, and lithiasis have been stated as the key firstly appearing features.[3,8]

The most prevailing clinical symptom/presentation for ureterocele is urinary tract infection, in about 50 percent of patients, this makes the managing physician to evaluate the urinary system.[19] Nevertheless, no evidence/signal of UTI was found in this patient. This is in tandem with a case earlier reported.[15]

Unilateral renal agenesis (URA) is the congenital absence of one of the kidneys due to inadequate stimulation of the metanephric blastema by the ureteral bud during embryonic development. [20]

URA is typically asymptomatic and may be found incidentally during checkup for congenital abnormalities, enuresis or abdominal pain, or patient possibly will present with clinical features of renal failure.[21] In this case report abdominal pain is the culprit. Approximately half (48 percent) of the patients with URA have accompanying urological anomalies which include vesicoureteral reflux (VUR) 28 percent, ureterovesical junction obstruction 11 percent, ureteropelvic junction obstruction 7 percent and coexisting ureterovesical and ureteropelvic junction obstructions 2 percent[22] ureterocele is noted in this case report which is equivalent to ureterovesical junction obstruction, but differs from a case report of an adult male with URA and bilateral cryptorchism.[23] Since there is a possibility of coexisting anomalies it is advised that all patients with solitary kidney should undergo a screening mictuirating cystourethrography and hysterosalpingography in females, as early detection is key in patient`s care and overall wellbeing. [21]

URA is frequently spotted incidentally with ultrasonography, confirmation with other radiological investigations is extremely important, as observed in our patient.

CONCLUSION

This case report has shown that radiological investigations are important in the evaluation of abdominal pains in our patient. Ultrasonography, intravenous urography (IVU), computed tomography urography (CTU) are complementary investigations in the evaluation of the renal system. Also magnetic resonance imaging (MRI) has a role too, however, not all centers have MRI.

CONSENT: Verbal/written consent was obtained.

Authors contribution: VNA- Manuscript conceptualization, reviewed the manuscript and interpreted the radiological studies, CW-Reviewed and edited the manuscript, also assisted with the interpretation of the radiological studies.

REFERENCES

I. Castellanos-Hemandez H, Garcia-Gonzalez VM, Figueroa-Zarza M, Garcia-Sanchez D, Gutierrez-Ochoa J Giant ureterocele: A case report. Rev Mex Urol 2013;73(2):80-3.

II. Stunell H, Barrett S, Campbell N, Colhoun E, Torreggiani WC, Prolapsed bilateral ureteroceles leading to intermittent outflow obstruction. J Bel Radiol-Btr2010;93(6):312-3.

III. Sepulveda W, Campana C, Carstens E, Rodriguez J, Prenatal sonographic diagnosis of bilateral ureteroceles: the pseudoseptated fetal bladder. J Ultrasound Med 2003;22(8):841-4.

IV. Shamsa A, Asadpour AA, Abolbashari M, Hariri MK, Bilateral simple orthotopic ureteroceles with bilateral stones in ab adult: A case report and review of literature. Urol J 2010;7(3)209-11.

V. Abdulkadir AY, Adesiyun OA, Popoola AA, Adekanye AO. Ureterocele: Self-resolved follow spontaneous extrusion of calculus. Trop J Health Sci 2008;16(2)39-40.

VI. Shokeir AA, Nijman RJ, Ureterocele: an ongoing challenge in infancy and childhood. BJU Int 2002;90:777-83. Doi:10.1046/j.1464-410x.2002.02998.x.x[PUBMED] [Crossref] [Google Scholar]

VII. Chavhan GB. The cobra head sign. A radiology 2002;225:781-2.

VIII. Tahboub A, Herskovits M, Loberant N. Bilateral orthotopic ureterocele. Imaging Sci today 2010;321.

IX. Kiprov DD, Calvin RB, McLuskey RT. Focal and segmental glomerulosclerosis and proteinuria associated with unilateral renal agenesis. Lab Invest 1982;46:275-281.

X. Trigaux JP, Van Beers BV, Delchambre F, Male genital tract malformations associated with ipsilateral renal agenesis:sonographic findings. J Cltn Ultrasound 1991;3:3-10.

XI. Thompson DP, Lynn HB Genital anomalies associated with solitary kidney. Mayo clin proct 1966;41:538-548.

XII. A Bhayana, S Jain Renal agenesis, blind ending ureteral remnant, and ectopic ureterocele. Astrolyte 4 2018:262 Doi:10.4103/astrolyte.astrolyte_10_18[Google Scholar].

XIII. Ozkul B, Aydemir H, Ayhan L, Urfall F. A rare case; concomitant ectopic ureterocele and megaureter with rnal aplasia. Atlas j med .2022;2(4):5[Google Scholar].

XIV. Saadeh A, Mahmoud MM, Azizieh O, Al-Samair A. Unilateral renal agenesis, blind-ended ureter and ectopic ureterocele: An incidental finding on abdominal CT scan. Radiol Case Rep 2022;17(11):4252-6. DOI:10.1016/j.radir.2022.08.039. PMCID: PMC9471340/PMID:36120523.

XV. Adesiyun OA, Oyinloye OI, Akande HJ, Atobatele MO, Adeniyi WA, Abdur-Rahman LO. Bilateral giant orthotopic ureterocele appearing as kissing cobra in a Nigerian child. West Afr J Radiol2015;22:42-4. Doi:10.4103/1115-1474.146151

XVI. Coplen DE, Duckett JW. The modern approach to ureteroceles. J Urol.1995;153(1):166-171. Doi:10.1097/00005392-199501000-00068[PUBMED] [Crossref] [Google Scholar].

XVII. El Hasbani G, Assaker R, Ahmad YJ, et al. Renal agenesis associated with contralateral ectopic ureter and hydroureteronephrosis. Radiol Case Rep.2021;16(3):430-32. Doi:10.1016/j.radcr.2020.12.022.[PMC free articles] [PUBMED] [Crossref] [Google Scholar].

XVIII. Ghaffari N Ectopic ureterocele. Am J Obstet Gynecol.2021;225(5):B14-B15. Doi:10.1016/j.ajog.2021.06.041. [PUBMED] [Crossref] [Google Scholar]

XIX. Gunsar C, Mir E, Sencan A, Ertan P, Ozean CU. Pediatric ureteroceles: Diagnosis, management and treatment options. Iran J Pediatr2010;20:413-9.

XX. Rathi V A blind-ending ureter with infection due to vesicoureteric reflux with associated renal agenesis: A rare cause of pain abdomen. Urol Ann 2011;3(2):100-102. Doi:10.4103/0974-7796’82179’[PMC free article] [PUBMED] [Crossref] [Google Scholar].

XXI. Edwarcls D, Beg I congenital lesions; the kidney and ureter.in:Sutton d ed. A textbook of radiology and imaging. Sixth Edition. London Churchill Livingstone1987;1110-1111.

XXII. Lee FT, Thombury JR The urinary tract, Anomalies in number. In:Paul LW Juhl J(Ed) .Essentials of radiologic imaging. Sixth edition. Philadephia, Lippincott-Raven1993;655-6.

XXIII. Onwuchekwa RC, Sapira MK, Onwuchekwa AC. Unilateral renal agenesis coexisting with bilateral cryptorchism in an adult Nigerian: sCase report. Niger Med J 2009;50(3):71-3[Pubmed] [Google Scholar]