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A rare case of unilateral ectopic insertion of ureter into the prostatic urethra demonstrated by 4D CT urography

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ABSTRACT

It is uncommon for the ureter to enter itself in the wrong place during birth. Rate of ectopic insertion of ureter is 0.05-0.025%. In females, insertion into urethra (33%), vestibule, vagina, cervix and uterus (<5%). Identification of the ureteral orifice and its re-ureteric implantation depend on the diagnosis of ectopic ureter insertion. This report describes a 32-year-old man who had an ectopic ureter that was discovered by a 4D CT urogram, an advanced imaging technique that makes CT scanners faster and more accurate. It also captures and evaluates the morphology of the urinary tract as well as movements related to urination and can be used to diagnose obstruction in a patient who is experiencing symptoms.

Keywords: Ectopic insertion of ureter, 4D CT urography, prostatic urethra.

1. INTRODUCTION

A congenital kidney defect known as an ectopic ureter insertion result from aberrant caudal ureter bud migration. According to the Mackie-Stethen hypothesis, the ureteric bud's lateral origin in the embryonic wolffian duct will result in the caudal opening when it is inserted into the urine bladder. According to the trigone precursor hypothesis, a big trigone antecedent will cause the ureter's lateral origin to be more pronounced and a delayed union between urogenital sinus and ureter will increase the ectopia's caudal location (Deng et al., 2016). Ectopic insertion of ureter associated with other congenital anomalies like duplex kidney, duplex ureter in 80-85% and anomalies like VACTERL (Al-Smair et al., 2022). Patients are symptomatic if the ureteral orifice opens beyond the external ureteral sphincter always in males. Incidence is 1:2000 most common in females 5:1. In woman, ectopic orifice is supraspincterically or infraspincterically thus locate at various positions like urethra, vagina, vestibule, uterus and gartner duct cyst (Balawender et al., 2022; Polo-Alonso et al., 2022). Previous studies with IVP, multi detector CT urography with associated 3D imaging provides better temporal and spatial resolution and now 4D CT urography is next level of advanced imaging (Senel et al., 2015).

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2. CASE REPORT

A 32-year-old male with right loin pain and urinary tract infection with blood tests within acceptable ranges. Ultrasonography demonstrates duplex collecting system in right kidney and mild pelvicalyceal system dilatation with grossly dilated ureter on right side. 4D CT urography demonstrated duplex collecting system with mild hydronephrosis and grossly dilated, tortuous ureter on right side (Figure 2). Right ureter seen inserting into prostatic urethra (Figure 3).

Figure 1 Sagittal post contrast CT image showing grossly dilated, tortuous ureter on right side

Figure 2 Coronal post contrast CT image showing grossly dilated, tortuous right ureter inserting into prostatic urethra

Figure 3 Axial 4D CT urogram showing grossly dilated tortuous ureter inserting in to the prostatic urethra and normal excretion of contrast

3. DISCUSSION

Genitourinary tract malformations with ectopic ureteric insertion are rare. And it is accompanied by partial or complete duplication of collecting system (30%) (Al-Smair et al., 2022). Incidence is 0.05-0.025%. The genetical defects that include RET, FGFR2, GATA3 are associated with abnormal ureteral opening and along with renal anomalies. Wegert-law Meyer's states that the upper pole moiety typically inserts into the inferior half of the urinary bladder's medial wall, whereas the lower pole moiety is exactly ectopic in the infra trigone (Schwarz et al., 2021). Patient presents with urinary tract infection when upper pole moiety fails to drain efficiently and may progress to vesicoureteric reflux. Radiological investigation includes 99mTc -DMSA scintigrapy for evaluating renal function. Ectopic ureteric orifice site obtained by IVU, MCUG, MDCT 3D/4D with intravenous contrast administration (Duicu et al., 2018; Mandell et al., 1981). Management and treatment of ectopic insertion of ureter mainly aims in preserving renal function. Some procedures like uretero–ureterostomy (End to side) performed if there is a functional upper pole moiety. In case of non-functional upper pole moiety partial nephrectomy is the treatment of choice to prevent infections and renal scarring (Ghosh et al., 2016).

4. CONCLUSION

Ectopic insertion of ureter is a unusual abnormality associated with double collecting system. 4D CT urogram is an advance imaging method helps in early diagnosis and treatment is important to prevent recurrent infections and loss of renal function due to renal scarring.

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Authors' contribution

M Kalaichezian: Conceptualization, supervision, methodology, resources, data collection, writing and formal analysis.
G Jayasri: Writing, investigation, resources, analysis, draft preparation, review and editing.
G Murugan: Writing, investigation, analysis, review and editing.
All authors have read and agreed to submit the manuscript.

Informed consent

Not applicable.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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