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CASE REPORT

A Documented Rare Case of a Duplicated Renal Collecting System with Ectopic Opening into the Vagina Managed with Robotic Assisted Heminephrectomy of the Non-Functioning Upper Moiety

Varun Agarwal[1] and Ojas Vijayanand Potdar[2,*]

[1]*Consultant Urologist, Uro-Oncologist and Robotic Surgeon, Current Affiliation: MGM hospital, Navi Mumbai*
[2]*Assistant Professor in Urology, Grant Medical College and J.J. Group of Hospitals, Mumbai*

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Abstract

Background: The definition of ectopic ureter is an abnormal opening of the ureter (single or duplex) that does not open in the trigonal region of the bladder. In 80% of these cases, ectopic ureter is associated with complete duplication. The upper moiety of a duplex kidney is usually the origin of a ectopic ureter in most of the cases. The opening of the ectopic ureteric in females can be anywhere from bladder neck to perineum with urethra, vagina, and vestibule. Duplex kidney, also known as duplex collecting system, is a common congenital urinary system anomaly with a morbidity of about 0.8–1%. We present a unique case of a completed duplicated system with ectopic ureter opening into the uterus leading to a non-functional associated upper renal moiety of the affected side which was managed by robotic assisted segmental nephrectomy. **Case presentation:** We present a case of 52-year- old lady who presented to urology outpatient department with complaints of sticky white perineal discharge through vaginum associated with left sided intermittent colicky flank pain who was diagnosed to have complete duplex left moiety with ectopic insertion of the upper moiety ureter into the vagina associated with non-functioning left upper renal moiety. She was managed by robotic assisted Left sided heminephrectomy with excision of left ectopic ureter. **Conclusion:** Our case report thus highlights the importance of adequate evaluation of a patient to determine the anatomy and the function of the kidney to decide for the definitive management of these patients with ectopic ureter and duplex kidneys.

Keywords: ectopic ureter, duplex system

*Corresponding author: Ojas Vijayanand Potdar
Email: ojaspotdar@yahoo.com

List of abbreviations

DJ Stent: Double J stent

CECT: Contrast Enhanced Computerised Tomography

DMSA Scan: Dimercaptosuccinic acid scan

Background

Ectopic ureter is defined as abnormal opening of the ureter (single or duplex) that does not open in the trigonal region of the bladder. In 80 % of these cases, ectopic ureter is associated with complete duplication. Most of the ectopic ureter arises from the upper moiety of a duplex kidney. In females, the ectopic ureteric opening can be located anywhere from bladder neck to perineum with urethra, vagina, and vestibule [1]. Duplex kidney, also known as duplex collecting system, is a common congenital urinary system anomaly with a morbidity of about 0.8%–1% [2]. We present a unique case of a completed duplicated system with ectopic ureter opening into the uterus leading to a non-functional associated upper renal moiety of the affected side which was managed by robotic assisted heminephrectomy.

Case presentation

A 52-year-old female presented to the urology outpatient department with complaints of sticky white perineal discharge associated with intermittent flank pain during these episodes. Local perineal examination did not reveal any abnormality. Per speculum examination of the vagina also was essentially normal. Patient was then evaluated by ultrasound which revealed duplex system with the ectopic ureter showing gross dilatation throughout and draining the upper pole renal moiety into the uterus on the left side whereas the normal ureter draining the rest of the left kidney into the bladder. Patient was then further evaluated using a Computerised Topography (CT) Urography which revealed duplex moiety on the left side with ectopic insertion of the upper moiety ureter into the vagina with moderate dilatation of the entire upper ureter and pelvicalyceal system of the upper ureter. The normal left ureter draining the rest of the left kidney was seen with insertion into the bladder. The right kidney and ureter were normal (Figures 1-5).

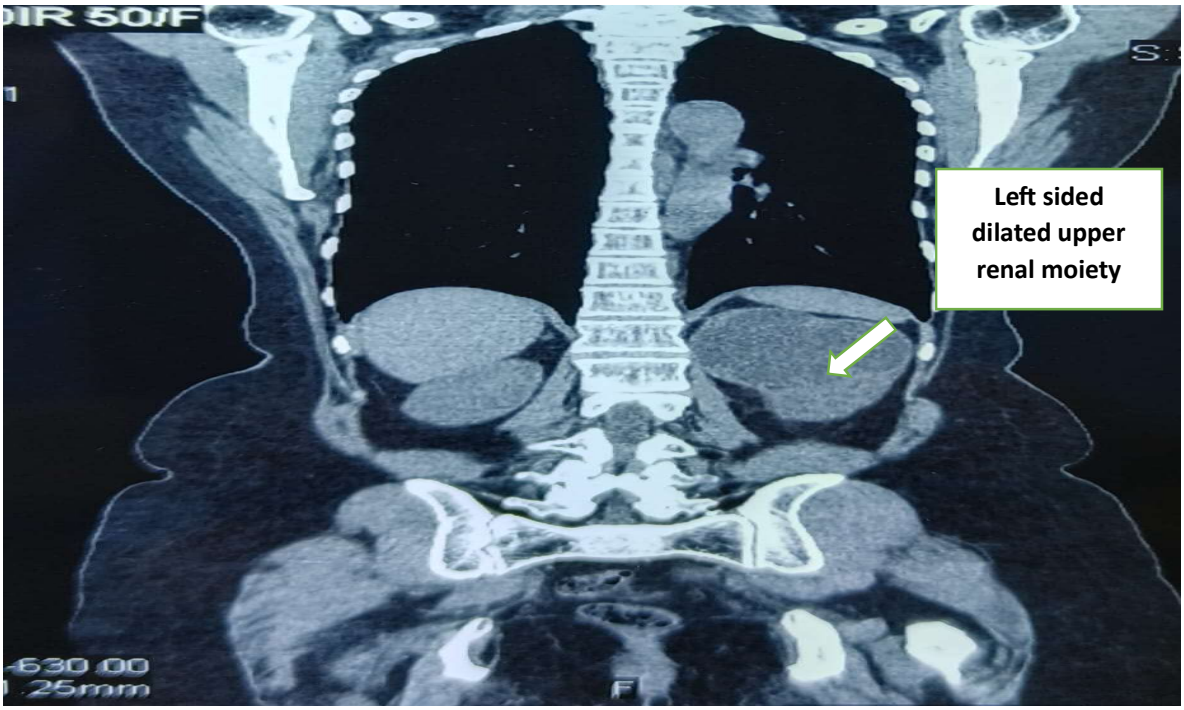

Figure 1. Coronal section of CECT KUB showing left sided dilated upper renal moiety.

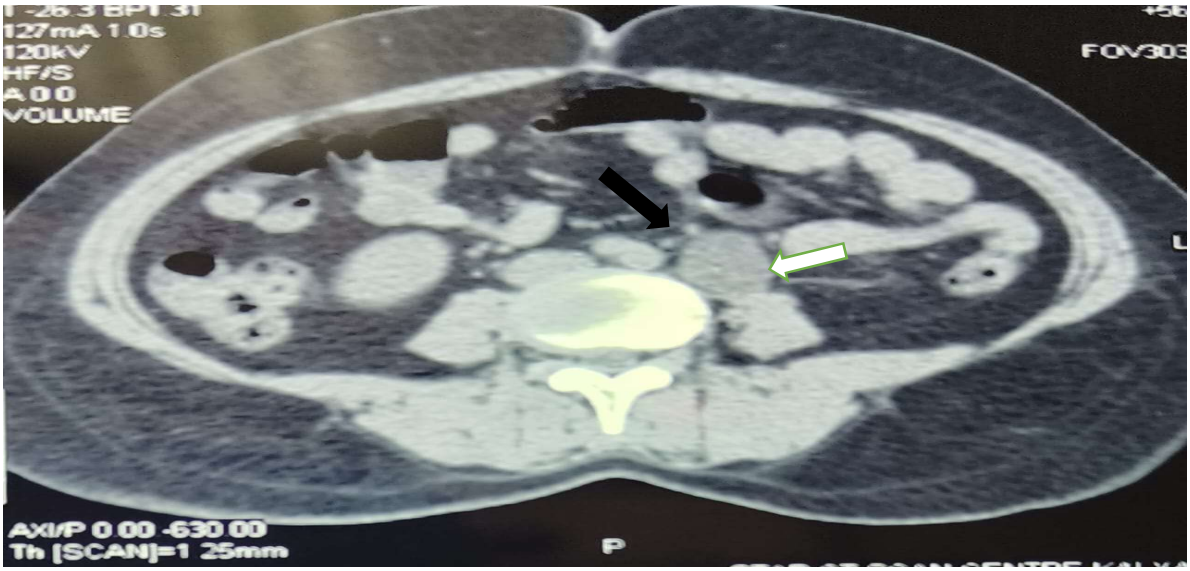

Figure 2. Axial section of CT KUB showing Left sided dilated ectopic ureter and left normal ureter. (Black Arrow-Left ectopic ureter and white arrow-Left ectopic ureter)

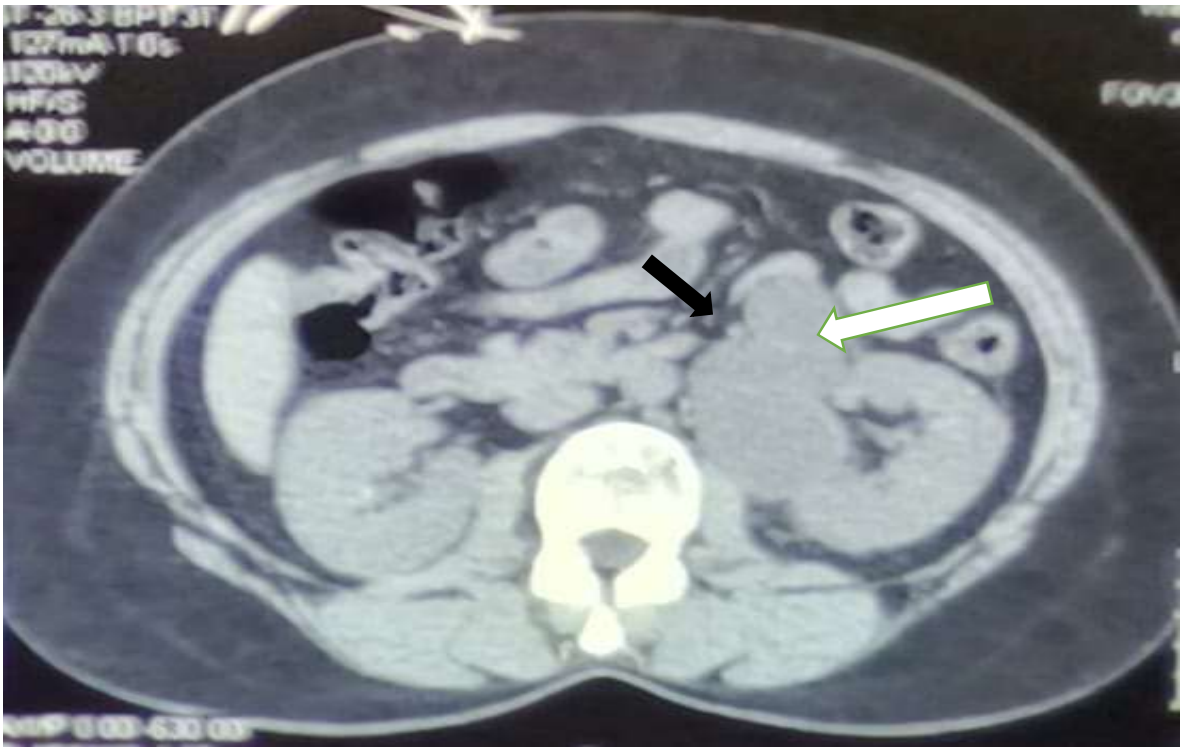

Figure 3. Serial Axial section of CT KUB showing dilated left ectopic ureter draining the upper renal moiety and left normal ureter. (Black Arrow-Left ectopic ureter and white arrow-Left ectopic ureter).

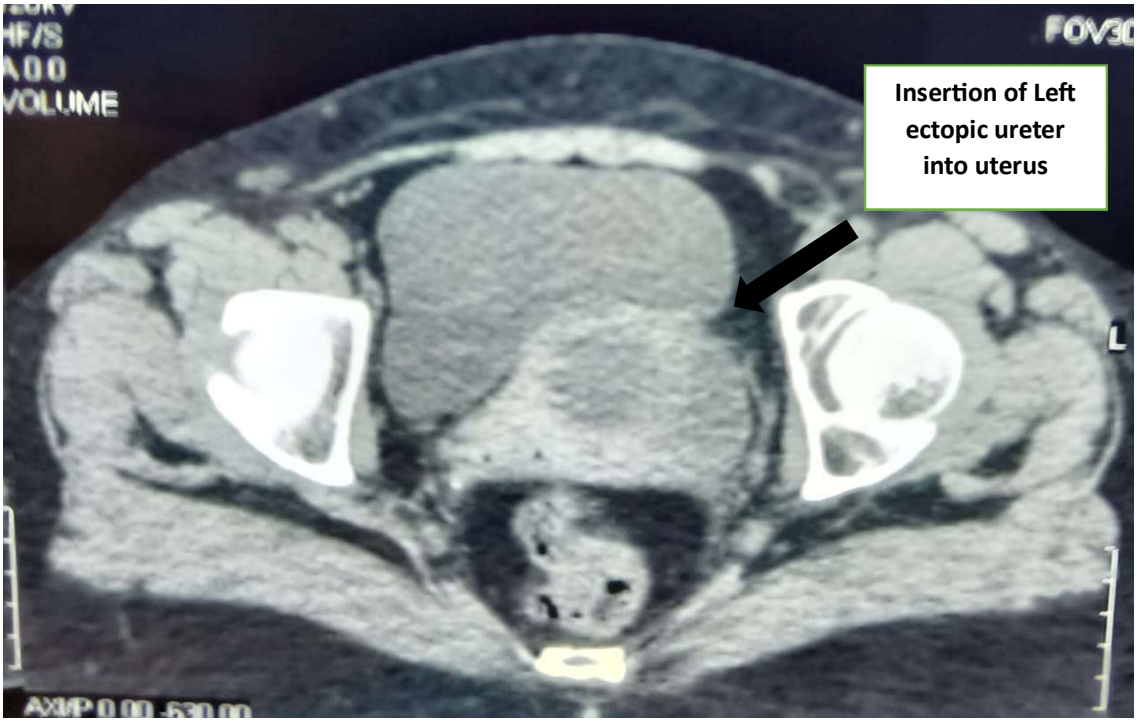

Figure 4. Axial section of CT KUB lower cuts showing insertion of the left ectopic ureter into the vagina.

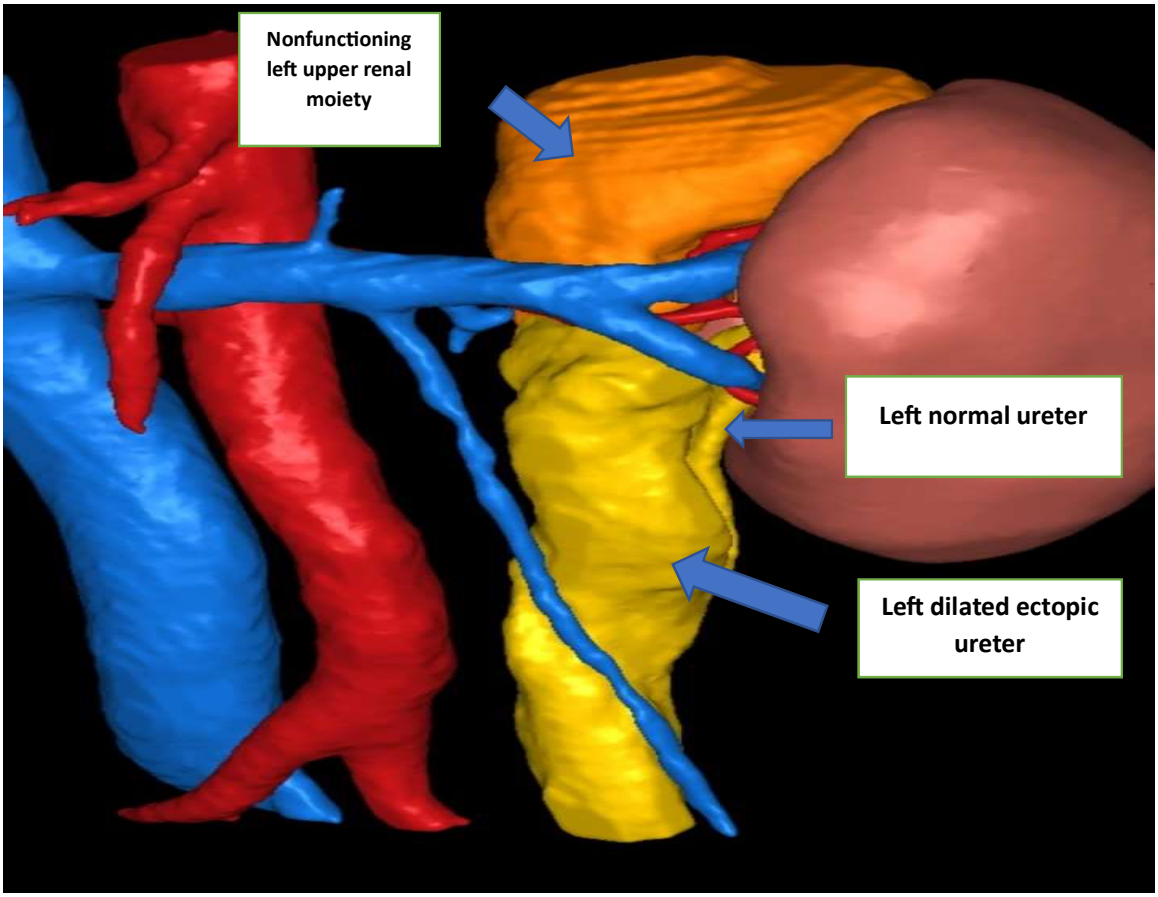

Figure 5. 3 D reconstructed image of the left side kidney showing two ureters- dilated ectopic ureter draining the upper renal moiety situated anteriorly and the normal ureter draining the rest of the middle and lower pole renal moiety situated posteriorly to the ectopic ureter.

In view of the non-functioning left sided upper renal moiety associated with recurrent episodes of left flank pain, decision was made to proceed with Robotic assisted Left sided segmental nephrectomy with excision of the left ectopic ureter. A cystoscopy was done before the definitive surgery which revealed normal bladder wall with normally placed bilateral ureteric orifices. Also, the left normal ureter was stented with 6/24 DJ stent to aid in identification and preservation of the left normal ureter (See Figure 6).

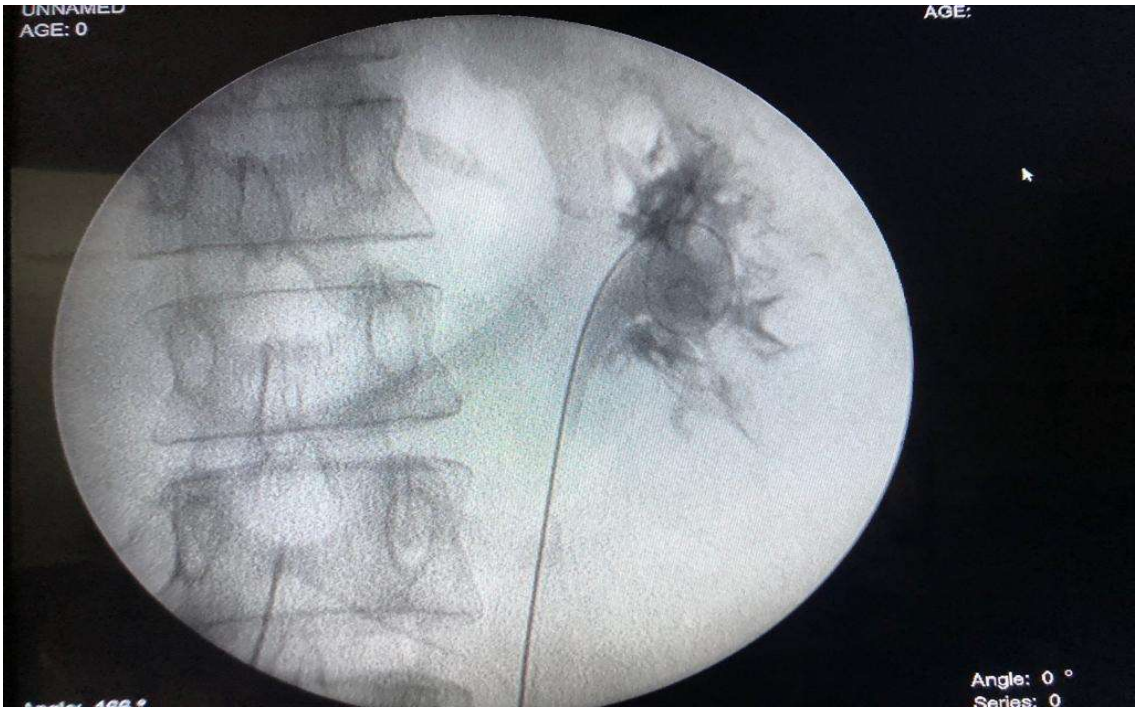

Figure 6. Left sided Retrograde pyelography image of the left side normal ureter draining the middle and the lower pole moiety followed by placement of 6/24 DJ stent to aid in identification during surgery.

Patient underwent robotic assisted left heminephrectomy with excision of the left ectopic ureter. A Da Vinci Xi (Intuitive Surgical) robot with three working robotic arms and one arm for camera was used for the surgery. A standard supraumbilical incision for 8 mm camera port and three more 8 mm ports were inserted -one in the left subcostal region, one in the lower left quadrant and one 5 cm above and superior to the left anterior superior iliac spine were inserted and one 12 mm assistant port were utilised for the robotic surgery (See Figures 7 and 8).

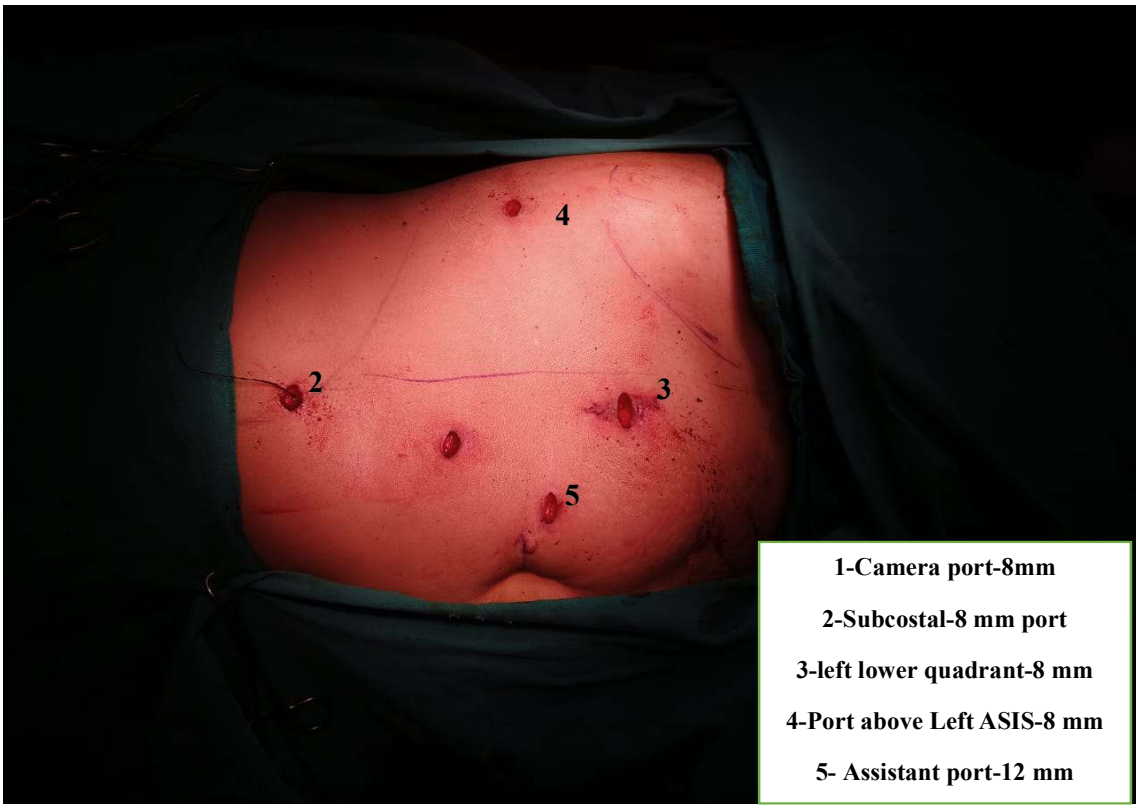

Figure 7. Intraoperative photograph showing port placement for the robotic arms and assistant port.

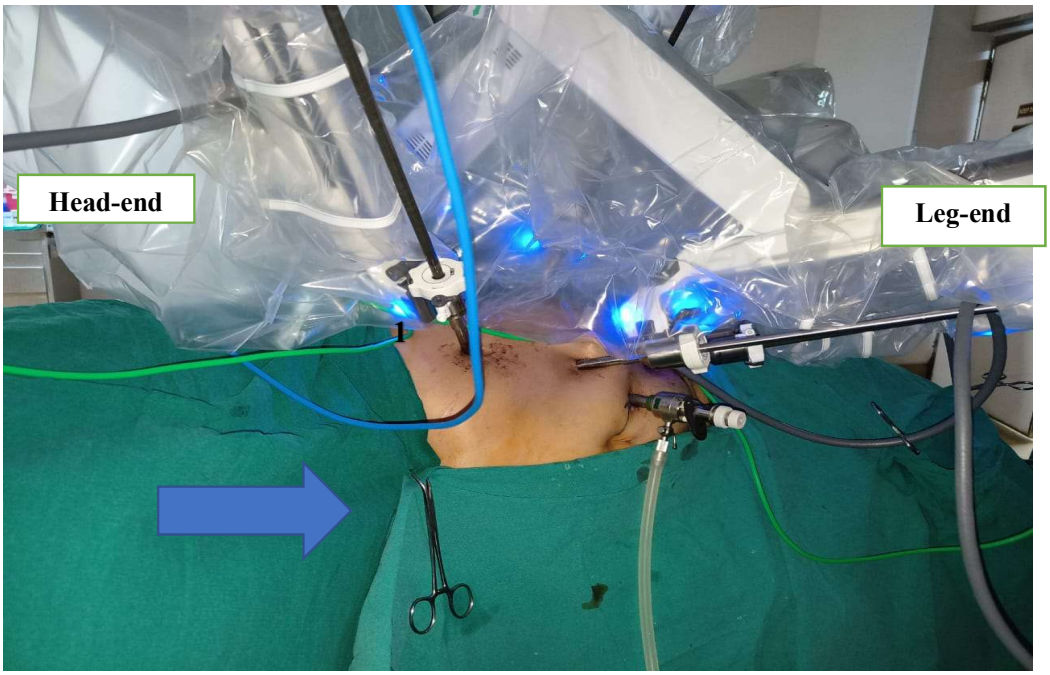

Figure 8. Intraoperative image showing the position of the ports and the Da Vinci Xi robot docked.

The surgery commenced with the mobilisation of the left colon medially from the white line of Toldt to expose the left kidney along with two left ureters and the gonadal vessels. Then the lower pole of the left kidney was exposed by tracing the left ureters. The two ureters were adherent to each other in a common sheath and were carefully separated with the DJ stent in the left normal ureter aiding in identification of the normal ureter (Figure 9).

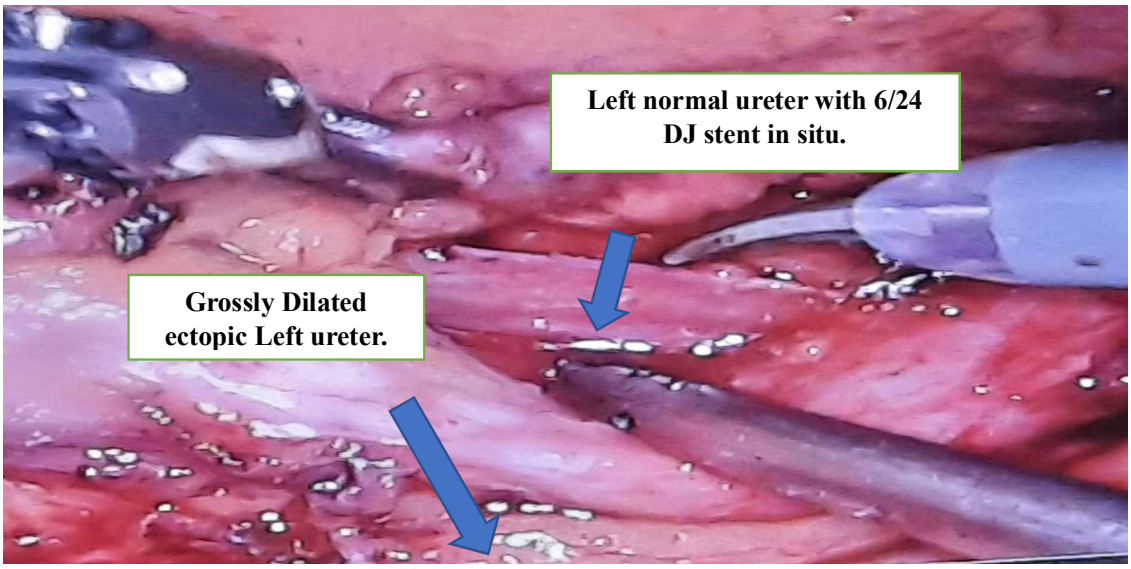

Figure 9. Intraoperative picture showing both the ureters of the duplex moiety of the left kidney.

The left ectopic ureter was carefully traced cranially where it was found to go behind the left renal vein (which was looped using a vesiloop) towards its origin from the left renal upper moiety. (See Figure 10).

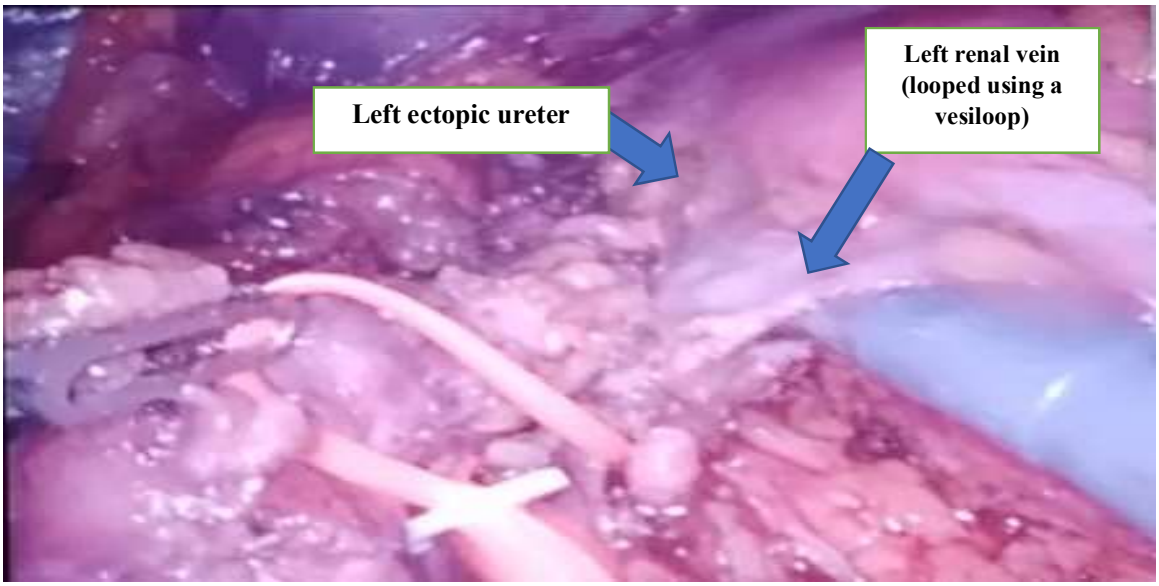

Figure 10. Intraoperative image showing the relation of the left ectopic ureter to the left renal vein (Left ectopic ureter was seen coursing posterior to the left renal vein)

Left sided hemi-nephrectomy of the non-functioning upper mole moiety was completed and the remaining left renal moiety of middle and lower pole was left behind. No renorrhaphy was required as there was clear delineation between the duplex moieties. The ectopic ureter was dissected till the level of external iliac vein and then through a small left flank incision, rest of the lower ectopic ureter was dissected to resect as much as possible of the ectopic ureter and then cut and the lower small segment stump was ligated. A pelvic drain was placed which was removed after 5 days. Patient had an uneventful recovery in the postoperative period with early mobilization and return to activity as the procedure was carried out by robotic assisted technique through small incisions. At 3 month follow up, patient reported no perineal discharge and renal function tests were within normal limits. Thus, this case report highlights the evaluation of patients with duplex moiety with ectopic ureter and their management by robotic surgery to aid in early recovery and earlier return to activity for the patient.

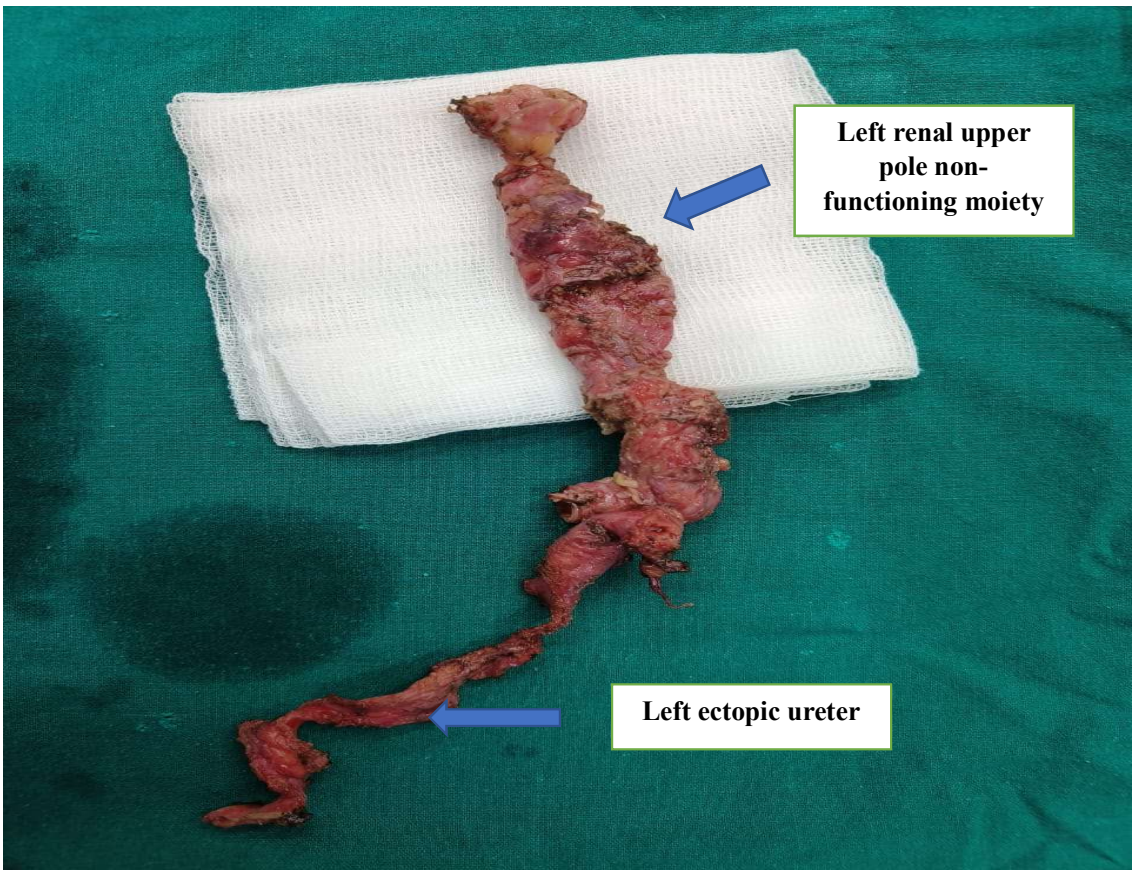

Figure 11. Postoperative image of the resected specimen of Left heminephrectomy with excision of the left ectopic ureter.

Discussion

The definition of ectopic ureter is a ureteric orifice outside the posterolateral extremity of the bladder trigone. The incidence of ectopic ureter is 1 in 2000 newborns. Male to female ratio is 2–6:1.The association of ectopic ureter with a duplicated renal collecting system is in 80-

85 % of the cases [1]. In our case, patient presented with sticky white discharge perineal discharge associated with intermittent episodes of flank pain. On further imaging, she was diagnosed to have complete duplex moiety with ectopic ureter draining upper renal moiety into the vagina and the normal ureter draining the middle and lower renal moiety into the bladder. In all cases imaging studies are mandatory to confirm the diagnosis. Contrast-enhanced computed tomography (CECT) or magnetic resonance imaging urography should be the method of choice for depicting or ruling out an ectopic ureter [3].

USG and IVU are usually performed for diagnosis. However, 16% of ectopic ureters may not be detected by IVP and so imaging modalities like CT/MRI or dimercaptosuccinic acid (DMSA) scan will have to be performed [3].

The renal function finally decided the finally surgical management in these conditions. In a functioning upper pole, the options are distal and proximal ureteroureterostomy (end-to-side). A concomitant ureteric reimplantation may be required in case of an associated lower polar refluxing system. The risk of infection may be eliminated by performing an upper polar nephrectomy in cases of non-functioning moiety [2,4]. In our case, heminephrectomy or the left kidney upper moiety was removed along with the left ectopic ureter.

Conclusion

Our case report thus highlights the importance of adequate evaluation of a patient to determine the anatomy and the function of the kidney to decide for the definitive management of these patients with ectopic ureter and duplex collecting system.

Ethical approval and consent to participate

Consent to participate is obtained from the patient.

Consent for publication

Consent for publication has been given by all the authors mentioned in the study.

Availability of data and material

The data and material required for the concerned patient was collected by use of hospital information system to collect patient related reports and other related data required for the study after obtaining consent from the patient and the hospital administration.

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

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