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Case Report

# An Interesting Case of Lifelong Urinary Incontinence

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## Summary

A 47 year old female with urinary incontinence since childhood was referred for investigation. She described continuous incontinence which was not associated with coughing, straining nor urgency. She felt she emptied her bladder normally and did not suffer from urinary tract infections. She had no significant past medical or surgical history apart from two normal vaginal deliveries greater than 10 years prior. Full blood count, serum renal function tests, urinalysis, Magnetic Resonance Imaging (MRI) pelvis, Computed Tomography (CT) urography, dimercaptosuccinic acid renal scintigraphy and mercaptoacetyl triglycinerenal scan were performed. CT Urography revealed a duplex right collecting system with an ectopic ureter originating from the right upper pole and inserting into the vagina (Figure 1). The patient was offered upper pole hemi-nephrectomy but opted for conservative management.

## Case Presentation

A healthy 47 year old female patient was referred for the investigation of urinary incontinence. The patient lifelong continuous low volume urine leakage requiring only one incontinence pad per day. It was not associated with lifting, coughing or straining and was not preceded by a sudden desire to void. The incontinence did occur at night, but it did not wake her up. She stated that she emptied her bladder normally, and did not suffer from frequent urinary tract infections (UTI). She has no significant past medical history, was on no medication, had never undergone surgery and had no allergies. She had two normal vaginal deliveries more than ten years prior to presentation and there was no change to her incontinence before or after the pregnancies. Physical examination was unremarkable.

## Investigations

Full blood count, serum renal function tests and urinalysis were normal. Magnetic Resonance Imaging (MRI) of the pelvis was performed as part of a gynaecological investigation. This showed a dilated and tortuous right ureter and a small cystic lesion to the left of the vaginal vault that appeared to arise from the adjacent peri-vaginal tissue. The bladder was normal in appearance (Figure 2). A CT urography was perfomed to assess her upper and lower urinary tracts. It revealed a duplex right collecting system with an ectopic ureter originating from the right upper pole and inserting into the vagina.

## Differential Diagnosis

The differential diagnosis of urinary incontinence in a woman of this age includes; Stress Urinary Incontinence (SUI), Overactive Bladder (OAB), mixed urinary incontinence, vesico-vaginal fistula and ectopic ureter.

## Outcome and Follow-Up

Subsequent Dimercaptosuccinic Acid (DMSA) scan showed an adequate amount of functioning renal tissue and Mercaptoacetyltriglycine (MAG-3) renal scan showed no further obstruction to lower poles. The patient was offered upper pole hemi-nephrectomy but elected to continue to manage her condition conservatively with the use of pads with regular follow up. One year after diagnosis she has had no change in her symptoms nor suffered

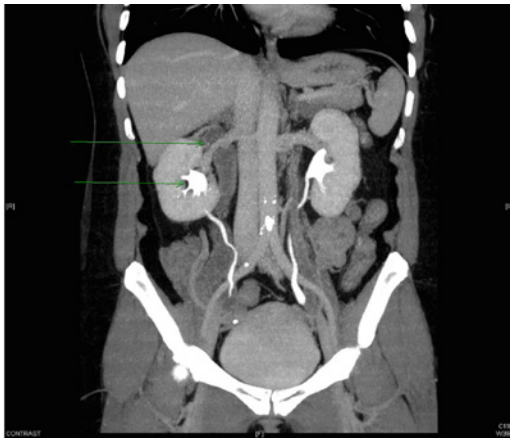

**Figure 1:** Image demonstrates contrast in renal pelvis and ureters. A duplex right kidney was identified with abnormalities. Abnormality (Superior arrow) – Dilated upper pole moiety and (Inferior arrow) –normal lower pole moiety demonstrating the drooping lily sign

**Figure 2**: Image demonstrates the lower right renal moiety inserting in to the bladder at the Right Vesico-Ureteric Junction (RVUJ). A separate dilated lesion is found lateral to vagina and appears to come from the right upper renal moiety.




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any UTIs or other complications.

## Discussion

This case represents a rare presentation of a rare congenital anomaly. An ectopic ureter is a ureter that does not insert into its normal anatomical location. The incidence of ectopic ureters is 1/2000–4000 patients. They can occur in single system kidneys, but most commonly occur as a result of a duplicated renal collecting system [1]. Most case are diagnosed in childhood, as a result of recurrent urinary tract infections. The late presentation and uncommon ureteric insertion site of this patient are rarely seen together [2].

In assessing any female patient with urinary incontinence, taking an accurate history and physical exam is essential. Often the cause can be determined by history alone. Women suffering from SUI will give a history of incontinence with coughing, sneezing or during physical activity. Women with an Overactive Bladder (OAB) will describe incontinence without any recognised stressor and often report sudden onset urgency, frequency and nocturia. Patients that describe both SUI and over-active bladder type symptoms might have mixed urinary incontinence. Continuous urinary incontinence could indicate a vesico-vaginal fistula particularly if there is a history of pelvic surgery. Alternatively, it can result from an ectopic ureter. For anatomical deformities such as ectopic ureter or vesico-vaginal fistula, imaging modalities are often necessary to confirm diagnosis [3,4].

Such imaging will depend on the setting. In the case of continuous urinary incontinence where ectopic ureter is suspected, renal ultrasound is often the initial diagnostic test. This may show a duplex kidney, dysplastic or normal upper pole moiety, and hydronephrosis. If the ectopic ureter drains into a normal calibre ureter and is therefore non-dilated, renal ultrasound may not be as helpful. CT urography or MRI urography may be required for further evaluation and to confirm the diagnosis [5].

The insertion site of the ectopic ureter often determines how the patient presents, and this varies between males and females. In males, the ectopic ureter inserts above the external urinary sphincter; 50% insert into the posterior urethra, 30% into the seminal vesicle and the remainder to sites including the vas deferens, bladder neck, prostate and epididymis [6]. As a result of insertion above the external urinary sphincter, males do not present with incontinence, but present with antenatal hydronephrosis or UTI. As with our patient, most females present with incontinence, as the insertion of the ectopic ureter will bypass the external urinary sphincter. Affected females will most commonly have normal voiding patterns with small volume leakage or spotting incontinence. The most common sites of female insertion include bladder neck and upper urethra (33%), vaginal vestibule between urethra and vaginal opening (33%), vaginal vault (25%) and less commonly the cervix or uterus (<5%) [5].

Duplex systems stem from anomalies of the ureteric bud. Premature leads to a bifid renal pelvis, or an incomplete duplex, with ureters that meet before the bladder. A duplex kidney with two distinct ureters occurs when two ureteric buds arise and both independently migrate to the metanephros. In this setting, the more cranial ureteric bud will connect to the upper pole. However at their caudal end, as the ureteric buds integrate into the bladder, that of the upper pole will rotate and migrate to a position more medial and caudal to that of its lower pole twin. This is the Weigert-Meyer Law. Insertion may be into the bladder or elsewhere along the mesonephric duct urogenital canal, as in our patient.

Treatment of an ectopic ureter is based mainly on the impact of the symptoms on patient's lifestyle, any adverse effects on renal function and age. Conservative management is a valid option in adults, but does not solve the incontinence problem and has potential risk for the future. The main form is the use of pads to help with the constant leak associated with ectopic ureter. The type of pad is chosen according to patient preference and the volume of incontinence [3].

Curative treatment requires surgery, and is preferred in children and symptomatic adults. Surgery tries to prevent further complications, solve the incontinence and reduce the UTI rate. The upper pole moiety is most commonly associated with an ectopic ureter. It is usually poorly functioning and can be treated by upper pole hemi-nephrectomy in these cases. Retaining the distal ureteric stump carries a less than 10% chance of re-operation for distal ureteric removal, whilst reducing the morbidity from a complete ureterectomy. When upper pole function is preserved, ureteric re-implantation is preferred. In this case, both ureters from the duplex kidney should be re-implanted together as they share a common sheath. Other alternatives to ureteric reimplantation include those techniques which drain the upper pole system into the lower pole system such as uretero-ureterostomy or an uretero-pyelostomy [7].

## Learning Points/Take Home Messages

1. The differential diagnosis of urinary incontinence in adult women is broad and includes ectopic ureter.

2. A history of lifelong continuous incontinence in the absence of stress or urgency symptoms is typical.

3. Conservative management is most appropriate in an adult patient with less troublesome symptoms and preserved renal function.

4. Surgical management consists of upper pole hemi-nephrectomy or ureteric re-implantation.

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