

The Outcome of Transurethral Electro-Endoscopic Resection of Orthotopic Single System Ureteroceles in Adults Nigerians

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Abstract

Background: Endoscopic transurethral electro-incision and resection are minimally invasive options for treating adult single system ureteroceles. Vesicoureteral (VU) reflux is frequently associated with ureteroceles and can complicate the treatment. The literature on endoscopic management is scanty from sub-Saharan Africa. This study aimed to describe the technique and outcome of adult patients who had transurethral incision and or deroofting of orthotopic single system ureteroceles.

Methodology: This was a prospective study on patients who presented with single system ureteroceles. All were diagnosed either by computerized axial tomography urography or intravenous urography and were followed up and monitored for resolution of symptoms, development of urinary tract infection, and ureterovesical reflux. The patients' demographic information such as their age, sex, details of endoscopic treatments, complications on follow-up were entered into Excel and analyzed using SPSS version 21.

Results: There were eighteen ureteric units managed in 10 patients with single system ureteroceles. The male: female ratio was 3:2. The 30-39 year age group (four; 40%) and 60-69 year age groups (four; 40%) had the highest frequency. Six (33.33%) had calculi, and 83.30% presented with lower urinary tract symptoms (LUTS). Nine (50%) of the ureteric systems had transurethral deroofting of ureteroceles (TUDU), while eight (44.4%) had transurethral incision of ureteroceles (TUIU). Urinary tract infection was the commonest complication. Ureterovesical reflux was present in two and two developed refluxes after TUDU. The patients with refluxes had antibiotics with the resolution of the ipsilateral symptoms. All had preserved renal function.

Conclusion: VU reflux in patients that underwent endoscopic incision or deroofting for single system ureteroceles is infrequent and can be managed conservatively. It is an effective treatment for single-system ureteroceles and has minimal complications.

Keywords: Endoscopic deroofting; incision; Single System; Ureteroceles; Vesicoureteric reflux.

Introduction

A ureterocele is a rare disorder characterized by cystic dilatation of the distal ureter.¹⁻³ The majority of ureteroceles are diagnosed and managed during childhood in developed countries and are often diagnosed prenatally.²⁻⁴ Adult ureteroceles are uncommon, and there is a rarity of guidelines in their management, with various procedures that have been used for treatments, both open and endoscopic.⁵ There are limited data to evaluate the outcome of these various treatment modalities. The treatment objectives include preserving renal function,

unimpeded urine flow, and ameliorating symptoms. Endoscopic transurethral electro-incision and deroofting are minimally invasive options for treating adult single-system ureteroceles.^{5,6} Vesicoureteral (VU) reflux is frequently associated with ureteroceles and can complicate the treatment.

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Endoscopic management in developing countries is infrequently described. This study describes the technique and outcome of adult patients who had transurethral incision and or resection of single system ureteroceles.

Methods

This was a prospective descriptive study on consecutive consenting patients who presented with orthotopic single system ureteroceles between October 2012 and October 2021 and had treatment either by endoscopic transurethral incision (TUIU) or transurethral deroofting (TUDU) at Urology Division, University of Port Harcourt Teaching Hospital and Rosiville Clinic and Urology Centre, Port Harcourt Rivers, Nigeria.

Patients Selection

Consecutive patients at any of the centres diagnosed with orthotopic single system ureteroceles form the sample population. Patients with other types of ureteroceles such as caeco-ureteroceles, double system and ectopic ureteroceles were excluded. All the patients had radiological diagnoses either by computerized axial tomography or intravenous urography. Patients with ectopic ureters, caeco-ureteroceles, those requiring open surgery were excluded. They were all counselled to either incision or deroofting the ureteroceles by electro-resection.

Patient Evaluation

They all had clinical histories and physical examinations done. A diagnosis was made based on either computerized axial tomography (CT) scan with CT urography or intravenous urography. The anatomy of the collecting system, type of ureteroceles, and preexisting UV reflux was noted and discussed with the patient. Urinary tract infection was treated with antibiotics.

Intraoperative technique

The patients all had regional anaesthesia by subarachnoid block; they were prepped and draped in lithotomy position. Antibiotic prophylaxis was given in all cases based on the appropriate sensitivity. We utilize a high-definition endoscopy system with Karl Storz's resectoscope loops and Collin's knife. Cystoscopy was first carried out with the bladder moderately distended, and the bladder cavity was inspected. The ureterocoele is noted and confirmed. A resectoscope fitted with Collin's knife is inserted into the narrowed ureteric orifice, and the lowest cutting energy was used to widen the ureteric opening by

about 5mm. We found that the effective cutting current is variable in our experience and depends on the thickness of the ureterocoele wall. The thicker and larger the ureterocoele, the higher the diathermy energy required to achieve incision. Deroofting was done using the resectoscope loop. Any coexisting calculus was fragmented with Holmium laser or litholapaxy and evacuated from the bladder. A foley catheter is then passed for temporary bladder irrigation, and this is removed after 24 to 48 hours.

Post-operative care

They commenced oral soon after recovery from anaesthesia and were discharged home the next day with oral antibiotics.

Follow-up

They were followed up and monitored for resolution of symptoms, development of urinary tract infection, and ureterovesical reflux. The outcome measures were resolution of clinical symptoms and ureterovesical reflux. The patients' demographic information such as their age, sex, details of endoscopic treatments, and complications on follow-up were entered into an electronic Excel proforma and analyzed using SPSS version 21.

Results

Characteristics of patients and ureteroceles

There were eighteen ureteric units managed in ten patients with single system ureteroceles. One had a left single system and a right prolapsed caeco-ureterocoele. The caeco-ureterocoele was not included in the study. There were six males and four females with a male: female ratio of 3:2. The 30-39year age group (four; 40%) and 60-69year age groups (four; 40%) had the highest frequency. Six (33.33%) urinary systems had calculi, and 83.30% presented with lower urinary tract symptoms (LUTS).

Endoscopic procedure

The mean operating time was 30minutes. One had holmium laser lithotripsy to fragment the stone. Nine (50%) of the ureteric systems with associated large ureteroceles or calculi had TUDU for adequate drainage of the system and removing the stone, while 8(44.4%) had TUIU. None of the patients had a double J stent for ureteral drainage.

Complications

Urinary tract infection was the commonest complication (1 cystitis and two pyelonephritis). UV reflux was absent in 14(78%) ureteric units and

observed in 4(22%). Ureterovesical reflux was preoperatively observed in two ureteric systems, and two of the systems with large ureteroceles developed refluxes after TUDU. All the patients with refluxes had antibiotic treatment with resolution of the ipsilateral symptoms. All patients had preserved renal function six months after their procedures and none of the patients developed VU reflux in any urinary system. All the patients maintained preserved renal function throughout the follow-up period. We also found no association of reflux with the side of the ureter ($p=0.719$), presence of ureteric stenosis ($p=0.245$), and calculi ($p=0.213$). The details of the procedure are shown in Figure 1-5 below.

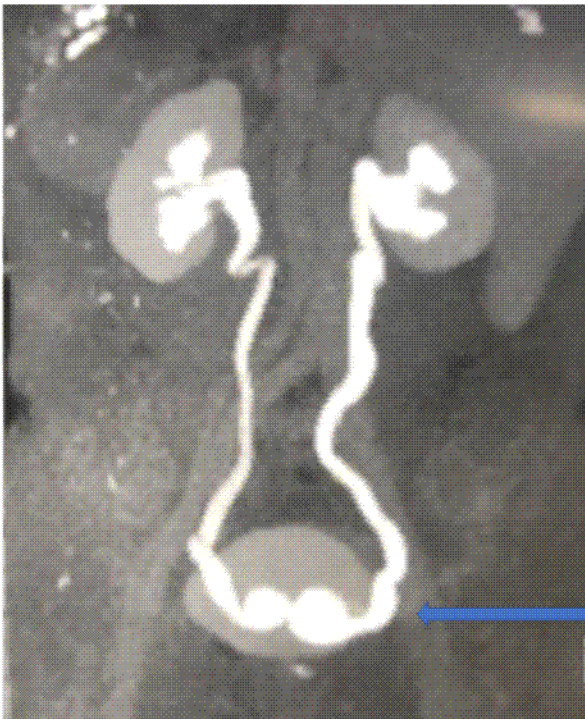


Figure 1: CT urography showing bilateral single system ureteroceles and showing the typical “Cobra-headed” appearance (Arrow).



Figure 2: Transurethral Incision of simple system ureteroceles using Collins's knife

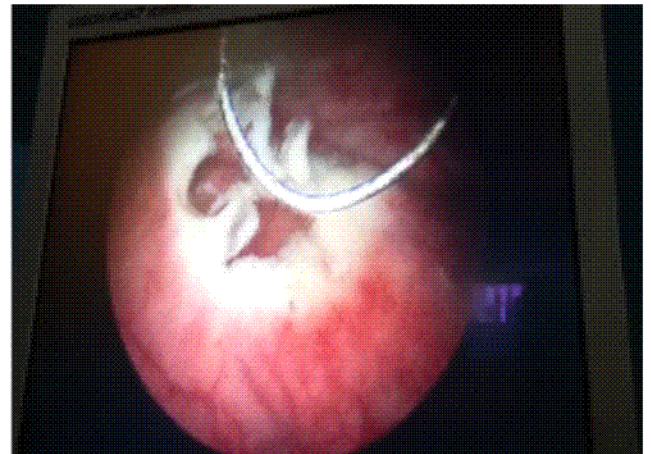


Figure 3: Transurethral deroofing resection of simple system ureteroceles

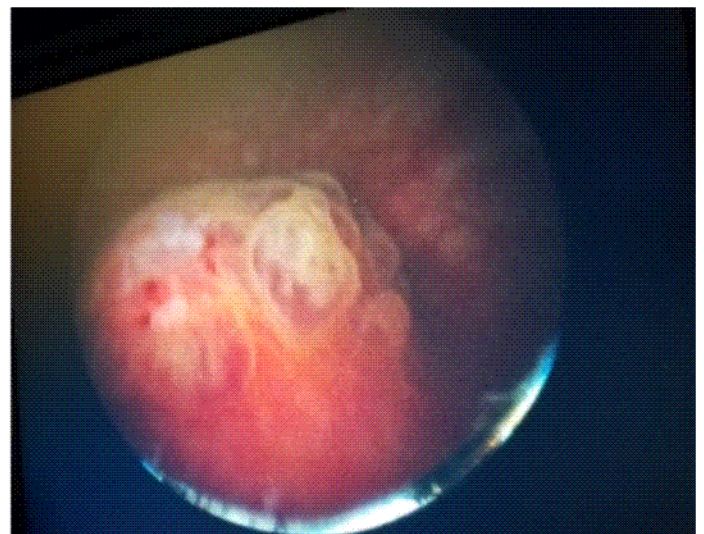


Figure 4: Calculus in a simple system ureteroceles

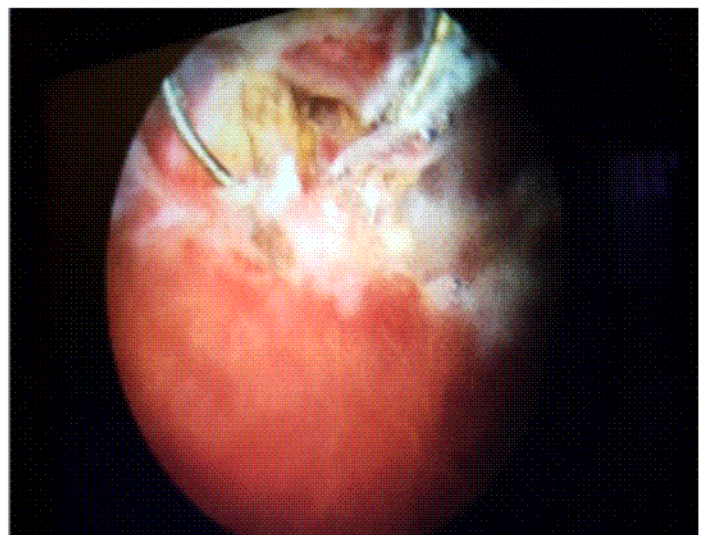


Figure 5: Transurethral deroofing resection of simple system ureteroceles with calculus

Table 1: Association between reflux and side of ureterocoloe, the status of the ureteric orifice, presence of stones

Side	Reflux	%	p-value
left	11	61.1	0.719
Right	7	38.9	
Ureteric Orifices			
Stenotic	14	77.8	0.245
Not stenotic	4	22.2	
Presence of Stones			
No	12	66.7	0.213
Yes	6	33.3	

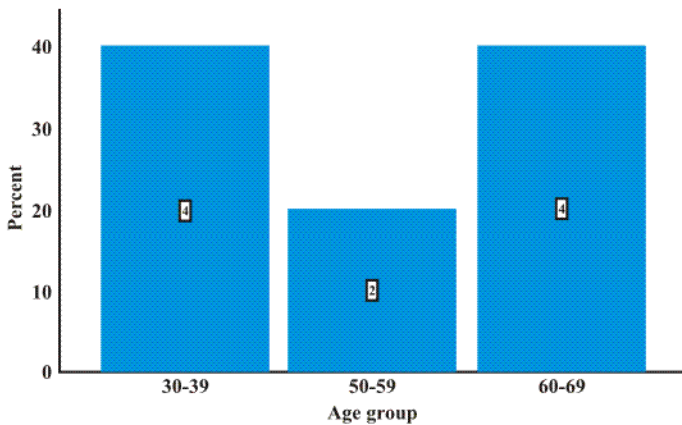


Figure 6: Age distribution of patients with ureterocoloe

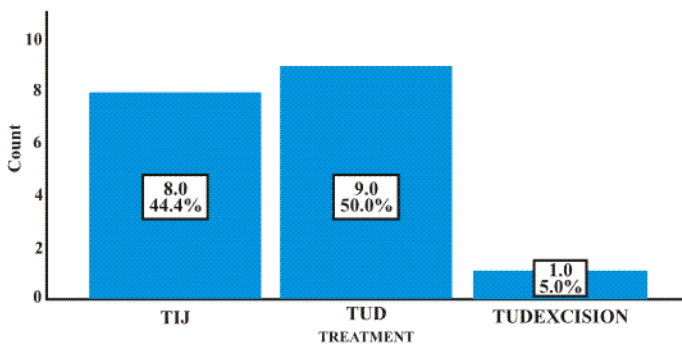


Figure 7: Types of endoscopic treatment for single system ureterocoloes

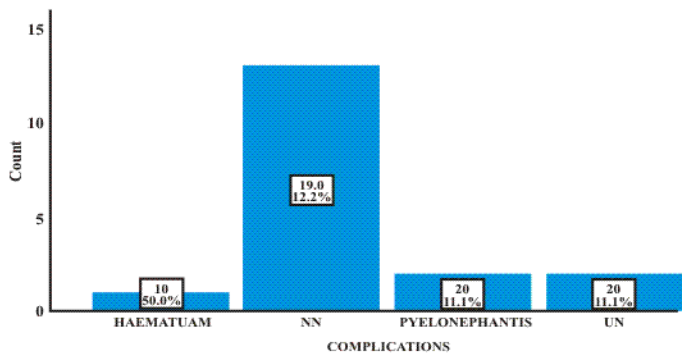


Figure 8: Complications from Transurethral deroofing and Incision of Ureterocoloes

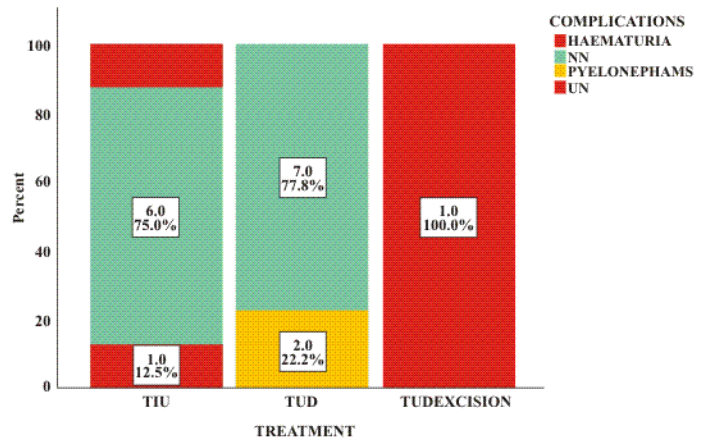


Figure 9: Comparative complications of transurethral incision and deroofing of ureterocoloe

Discussion

Ureterocoloe is a cystic dilatation of the distal submucosal part of the intravesical ureter. The aetiology is unclear, and the majority present and are managed during childhood, especially in developed countries.^{1,2,4} Not many are seen in adults as shown in our study with ten patients over ten years presenting with single system ureterocoloes. The age presentation in our study was bi-modal in the 30-39 year and 60- 69year groups, respectively. It was commoner in males with a male: female ratio of 3:2 even though other studies have reported commoner in females.⁷

Single system orthotopic intravesical ureterocoloes are the commonest type of ureterocoloes, accounting for up to 75% of ureterocoloes. The frequent presentation in adults with preserved renal function suggests a favourable natural history.⁵ Treatment is indicated in patients with recurrent urinary tract infections, deteriorating renal function, impaired ureterovesical drainage, and severe vesicoureteral reflux.⁵

Endoscopic treatment either by transurethral incision or deroofing affords the patient a minimally invasive option with minimal morbidity, leaving open a chance for ureteroneocystoplasty, if necessary, to correct ureterovesical reflux. Many forms of endoscopic treatments have been described, including but not limited to the incision with cold knives, diathermy electro-incision and -resection and lasers.⁸ A study compared holmium laser meatotomy with diathermy meatotomy and found no statistically significant difference in the outcome.⁸ However, there are no available randomized control studies to compare different treatment options.⁹

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