

## Ureteric Catheterization Using Infant Feeding Tubes Following Ureteroneocystostomy in a Low Resource Setting

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### Abstract

**Background:** Ureteric catheterization is extensively used in various urological procedures including ureteroneocystostomy. The standard ureteric stents are usually expensive, difficult to access and of variable quality in our setting. Infant feeding tubes have been used in similar low resource setting as ureteral stents. This study seeks to document our experience with the use of infant feeding tubes as ureteric catheters with respect to their complications and outcome.

**Methods:** This is a retrospective study conducted at the National Obstetric Fistula Centre, Abakaliki, Nigeria from January 2014 to April 2016. The records of 23 women who had ureteroneocystostomy were available for review. Ethical clearance to review casenotes was obtained for the study. Infant feeding tube was improvised as ureteric stents to achieve ureteric patency following ureteroneocystostomy. The infant feeding tube was inserted through the bladder into the neo ureteric orifice in each patient which was then connected to the eye of a urethral catheter.

**Results:** All 23 women reviewed in this study had ureteric fistula. Their mean age was  $33.8 \pm 8.8$  years. A total of 13 patients (56.5%) had right ureteroneocystostomy while 10 (43.5%) had left ureteroneocystostomy. All patients had the infant feeding tube for 7 to 10 days. All 23 patients had successful ureteroneocystostomy and the post-operative period was unremarkable. They were followed up for a period of six months and remained dry.

**Conclusion:** In patients with ureteric fistula, infant feeding tubes which are readily available in our environment appear to be effective when used as modified ureteric stents following ureteroneocystostomy.

**Keywords:** Infant feeding tubes; Ureteric fistula; Ureteric catheterization; Ureteroneocystostomy

### Introduction

Indwelling ureteric stents are tubes that allow urine to drain unimpeded from the renal pelvis to the urinary bladder [1]. Ureteral stents represent a minimally invasive alternative to preserve urinary drainage whenever ureteral patency has deteriorated or is under a significant risk of occlusion [2]. Stents and catheters are commonly used in urology for a wide range of indications ranging from urolithiasis to reconstruction, trauma and transplantation [3]. Ureteric stents are of great importance in repair of ureteric fistula [4,5]. Stenting provides urinary diversion, facilitates healing, prevents stricture formation and maintains the diameter of the passage [1,3]. Ureteric stent placement is now considered a standard and indispensable urologic tool [6]. Available literature have also shown the usefulness of stents during colorectal surgery [7,8] and in the management of ureteric endometriosis [9].

An ideal stent should be easy to insert, resistant to migration, tolerated by patient, biocompatible, biodurable, resistant to encrustation, nonrefluxing, radiopaque or visible at ultrasound, easily removed, versatile, affordable and should have optimal flow characteristics [4,6]. Consequences and complications of ureteral stent placement are irritative voiding symptoms, incontinence, suprapubic or flank pain, vesicorenal reflux, hematuria, pyuria, urinary tract

infection, malposition, migration, inadequate relief of obstruction, encrustation, ureteral erosion or fistulization, fracture and forgotten stent [1,3,6,10-12].

Various types of stents have evolved over the years with the use of different kinds of materials so as to get an ideal ureteric stent [4]. The use of readily available and cheap infant feeding tubes as ureteric stents have also been described [13-15]. Despite the advances that have been made, the ideal ureteric stent is difficult to find [4,6].

Arising from the point of availability and affordability, infant feeding tube has found use as ureteral stents and several studies have provided support for the practice [13-15]. Similar reasons were reported by workers in India [13] for the use of infant feeding tubes as ureteral stents in certain types of urological procedure. A related study from Pakistan [15] concluded that open pyeloplasty with feeding tube as a nephrostomy cum stent is cost effective and has least postoperative complication as compared to conventional Double J (DJ) stenting.

This study seeks to document our experience with the use of infant feeding tubes as ureteric catheters with respect to their complications and outcome.

### Materials and Methods

This is a retrospective study carried out at the National Obstetric Fistula Centre, Abakaliki, Nigeria from January 2014 to April 2016. The center provides free surgical services to patients with urogenital

fistula. It has a bed space capacity of 96. Out of 29 patients who had repair of ureterovaginal fistula over the study period, 23 case folders (79.3%) were available for this study. Ethical clearance to review casenotes was obtained. All the patients were referred to our health facility. They had examination in theatre with dye test. During dye test about 100 ml of dye was instilled into the bladder. A negative dye test in the presence of clear urine in the vagina was taken to be ureteic fistula. Infant feeding tubes were used as ureteric stents to achieve ureteric patency following ureteroneocystostomy. In these patients, ureteroneocystostomy was done per abdomen. The ureteric orifices were inspected through the bladder to determine the side that had the pathology. The affected ureter was then re-implanted to the bladder. The end of the feeding tube with a stopper was cut transversely ensuring a smooth end before application. The blunted end of the infant feeding tube was inserted through the bladder into the neo ureteric orifice while the other end was then connected to the eye of the Foley's catheter with vicryl suture for drainage of urine and subsequent ease of removal. Either size 6 or 8 infant feeding tube was used for each patient.

The feeding tubes were removed between the 7th and 10th postoperative day. After removal of the feeding tubes, the urethral catheters were reinserted to be removed on the 14th postoperative day. All patients had postoperative antibiotics. They also had high oral fluid intake during the postoperative period. All our patients were evaluated for loin pain, haematuria, pyrexia, urinary frequency, urgency and pain on voiding. All patients had urethral catheterization for 14 days. They all went home dry on the 14th postoperative day and had remained dry after six months of follow up.

## Results

All 23 women reviewed in this study had ureteric fistula. The age distribution of patients was between 8 and 46 years with a mean of 33.8 ± 8.8 years. Twenty one (91.3%) of respondents were married. All were Christians. Seventeen (73.9 %) of patients were Igbo. Trading was the most frequent occupation (47.8%). Majority of patients (74%) had a primary level of education. The sociodemographic variables are as shown in Table 1.

Variable	Frequency (%)
<b>Age</b>	
10-19	2 (8.7%)
20-29	3 (13%)
30-39	17 (74%)
40-49	1 (4.3%)
<b>Marital status</b>	
Married	21 (91.3%)
Single	1 (4.35%)
Divorced	1 (4.35%)
<b>Tribe</b>	
Igbo	17 (73.9%)
Yoruba	2 (8.7%)
Urhobo	2 (8.7%)

Others	2 (8.7%)
<b>Level of education</b>	
Primary	17 (74%)
Secondary	3 (13%)
Tertiary	2 (8.7%)
No formal education	1 (4.3%)

**Table 1:** Sociodemographic characteristics of patients.

Cause of fistula	Frequency (%)
Caesarean section	16 (69.6%)
Abdominal hysterectomy	5 (21.7%)
Congenital	2 (8.7%)

**Table 2:** Cause of fistula.

All patients presented with involuntary leakage of urine through the vagina. Most patients (69.6%) of patients had ureteric fistula from caesarean section. This is as shown in Table 2. During examination in theatre, all patients had a negative dye test despite the presence of clear urine in the vagina. A total of 13 patients (56.5%) had right ureteroneocystostomy while 10 (43.5%) had left ureteroneocystostomy. A total of 12 patients (52.2%) had size 8 infant feeding tubes improvised as ureteric stents while 11 (47.8%) had size 6 infant feeding tubes. All patients had the infant feeding tube for 7 to 10 days. All 23 patients had successful ureteroneocystostomy and the post-operative period was unremarkable. There were no significant postoperative complications in our patients. Infant feeding tubes were removed on the seventh to tenth postoperative day by gentle traction without any complication. Patients were discharged on the 14th postoperative day. They remained dry after six months of follow up.

## Discussion

Ureteric catheterization is extensively used in various urological procedures [3]. It is of great importance during repair of ureteric fistula [4,6]. Contemporary stents have improved flow characteristics and are relatively more tolerable once inserted [3]. These standard stent materials are usually expensive and not readily available in our setting. Infant feeding tubes are cheap and readily available in our environment and have been used as ureteric stents in various urological procedures [13,14,16]. Some have advocated the use of infant feeding tubes as an accomplished modified stent in resource limited setting due to its very low cost, easy availability, simplicity and ease of removal [13].

Most gynaecologists and urologists believe that stents stabilise and immobilise the ureter during healing, allow orderly regeneration of

uroepithelium and smooth muscle, help prevent urine extravasation and prevent stenosis [5,17]. Our patients had ureteric stents for 7-10 days though duration of six days to six weeks have been reported [12,14,18,19].

Although several complications following use of ureteric stents have been documented none of the patients in our study had any significant complication. One reason why complications were not common in our patients may be due to the short duration of the stent following surgery. Stent encrustation, stone formation and stent fracture are complications more likely to occur with increasing duration of stenting [10]. Stent migration can also occur [10] though this was not seen in our study. Another probable reason why our patients had no significant complications may be because we strongly encouraged high oral fluid intake following surgery. Low urine output because of less intake increases the risk of complications [6]. The findings of this study are similar to the low complication rate reported by Arshad et al following the use of infant feeding tubes as ureteric stents [2].

In all our patients, infant feeding tubes were successful in providing free drainage. They were discharged on the 14th postoperative day and they all went home dry. The success rate following ureteric fistula repair reported in our study is similar to that reported from Zaria, North-Central Nigeria [20]. They have been on follow up for at least six months and have continued to remain dry and in good condition.

This study is limited by the sample size. Another limitation is that we did not compare the use of infant feeding tubes with standard ureteric stents in this study.

## Conclusion

Infant feeding tubes are useful for short term stenting. In patients with ureteric fistula, infant feeding tubes may be effectively used as modified ureteric stents following ureteroneocystostomy. They are cheap, readily available, easy to insert, easy to remove and complications are uncommon. All stents can at times be associated with complications.

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