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Original Article

Safety and Efficacy of Ureterorenoscopy in the Management of Ureteric Stone During Pregnancy

Aftab Ahmed Channa[1*], Sadia Khanam[2], Shumaila Ashfaq[3], Nauman Ahmed[4], Abdul Basit Niazi[5] and Muhammad Zahid Ahmad[6]

[1]Department of Urology, Islam Medical & Dental College, Sialkot, Pakistan
[2]Department of Obstetrics and Gynecology, Islam Medical & Dental College, Sialkot, Pakistan
[3]Department of Anesthesia, Islam Medical & Dental College, Sialkot, Pakistan
[4]Department of Urology, Government KOT Khuwaja Saeed Teaching Hospital, Lahore, Pakistan
[5]Department of Urology, Niazi Medical College Sargodha, Pakistan
[6]Department of Urology, King Edward Medical University (Pakistan) KEMU/Mayo Hospital, Lahore, Pakistan

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***Corresponding Author:**
Aftab Ahmed Channa
Department of Urology, Islam Medical & Dental College, Sialkot, Pakistan
draftab.channa@gmail.com

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ABSTRACT

Ureterorenoscopy is a procedure to examine the urinary tract using an ureteroscope. **Objective:** To identify the effectiveness of ureterorenoscopy for treatment of ureteric stones in pregnant women. **Methods:** A total of 33 pregnant women visited the Obstetric and Urology departments of hospital were included in the study. They had complaint of renal colic pain. Their demographic features, age, trimester and clinical features were noted during initial profile records. The statistical analysis using SPSS Version-21 was performed. **Results:** In this research 33 subjects presented with renal colic pain belonging to a gestation period of 8 weeks to 33 weeks. Ureterorenoscopy was performed on all patients (right side stone in 18, 13 with the left side, and 2 with bilateral). Hematuria was observed in 6 patients, nausea vomiting in 18 patients, the two were presented with acute urine retention, and one patient presented with oliguria due to bilateral ureteric obstruction. Stone was broken, and clearance was observed in 28 (85%) patients. In other 5 (15%) patients, stone was pushed back, and obstruction was relieved. **Conclusion:** Ureterorenoscopy is a definitive first-line Treatment. It is safe and effective in pregnancy with calculus obstructive uropathy.

INTRODUCTION

In the mid-1980s, kidney stones were treated using lithotripsy and percutaneous nephrolithotomy, while ureterorenoscopy was rarely carried out until the 1990s, now the ureteroscopes was being widely used for operating kidney and ureteral stones. Ureterorenoscopy is a process of performing endoscopy, passing it through the urethra, bladder to enter the upper urinary tract. The use of ureterorenoscopy has gained more popularity in recent years.The advancements in procedures have made it a minimally invasive therapy with the least per-operative complications. According to various studies, the formation of stones in the bladder and urinary tract is highly frequent in pregnant women [1]. Patients presenting with urolithiasis during the first or second trimester normally have the complaint of renal colic pain, difficulty in urination, fever, tenderness, and hematuria. Some studies showed

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left hydronephrosis >10mm to be one of the clinical symptoms that predict urolithiasis [2,3]. The most common clinical symptom of urolithiasis in pregnant women is pain on the side of the torso (also called flank pain), and in a study of 144 subjects, around 96.5% of cases reported it [8]. Other symptoms reported are hematuria, urinary retention, and other symptoms such as dysuria nausea and vomiting [4,5]. However, traditional clinical signs can be less significant to base the diagnosis as back or flank pain, and hematuria can also result from the usual pregnancy changes [6]. In pregnant women, urolithiasis management needs detailed clinical assessment and considerate examination of imaging risks to the mother and fetus. As reported, around 0.026% to 0.531% of urinary calculi occurs during pregnancy and may be related to 40% of premature births. Due to the fetus's sensitivity and risks involved with radiation exposure, many scans test are entirely skipped in diagnosing the patient with renal colic pain. According to Lewis's study, such symptoms can lead to premature birth, abortion, or low-birth-weight infants [7,8]. Different methods are widely used to manage ureteric stones depending on the size of the stone and complexity, from ureterorenoscopy to laparoscopic ureterolithotomy extracorporeal shockwave lithotripsy (ESWL). Comparatively, the results of Ureterorenoscopy are reported to be 76.9%-100% accurate than other available treatments [9,10]. Therefore, an abdominal ultrasound examination is mostly chosen for pregnant patients and conclusive investigations are carried out in cases with abdominal pain and alleged renal colic. Around 5–15% in the world are affected by renal colic, with 50% having a repeat rate. Due to the high prevalence, Urinary stone disease is a significant liability in Pakistan healthcare departments [11].

METHODS

The study was conducted at Islam Medical and Dental College/ Islam Teaching Hospital, Sialkot from Jan 2016 to Dec 2019. A total of 33 pregnant women attended the Obstetric and Urology departments of hospital were included in the study. The sample size was calculated by taking the confidence interval as 95%, margin of error as 5%. Non-probability consecutive sampling was employed [12]. Clinical details, including checks for renal functioning, urine culture, ultrasound and consultation records of obstetricians were collected. To ensure safety of the fetus, no KUB, IVU, or CT scan was done on the patients. Inclusion Criteria:Patients with renal colic pain,Patients with ureteric calculi,Patients with hydronephrosis.Patients who didn't respond to oral antibiotics were referred for surgical interventions. Ureterorenoscopy was performed as first-line treatment in all cases with semirigid ureteroscope and DJ stent placement. After induction of spinal anesthesia, Patients were laid in lithotomy position for surgery, the surgeon elevated the right side of patient to divert pressure on the uterus's inferior vena cava. Fetal heart sounds were monitored throughout the obstetrician's operation while ureterorenoscopy was performed using 6/7.5 for semirigid ureteroscope (Wolf) with a 4.2 × 4.6 Fr working channel and 7.3/8 with a 3.6 working channel. For emergencies of the ureteric orifice, balloon dilators were available. Renal ultrasound monitoring was done without fluoroscopy, and fragmentation of stones was done using pneumatic lithoclast, and Upper ureteric stones were confined in the dormia basket during disintegration. An introduction of a DJ stent was done at the close of the process in almost all the cases. Other post-operative care and fetal monitoring were advised for women showing symptoms of cramps and vaginal discharge. Patients were released according to the health of the fetus and the child.

RESULTS

Out of the 33 patients, all women were presented with renal colic pain. The age distribution is shown in the table below (table 1). The patients' mean age is calculated as 31 years (standard deviation: 5.71; range: 22-41years). The most repeated age groups were 30-34 years with nine patients (27%) and 22-26 years and 38 -41 years with seven patients in both (21%) and 26-30 years and 34-38 years with five patients (15%) each with the gestation period varying from 8 weeks (1st trimester) to 33 weeks (3rd trimester). The stone size ranged from 0.4cm to 1.2cm, with a mean size of 0.95 cm.

	Variables	Total Population	Clinical Symptoms	
			Variable	PL=33
Demographics	Mean Age ± SD	31±5.71	**Stone Size-(cm)**	
	Max	41	Mean Size ± SD	0.95± 0.307
	Min	22	Max	1.2
	Gender ,No (%)	Females: 33 (100%)	Min	0.4

Table 1: Demographics of Patients and other clinical symptoms

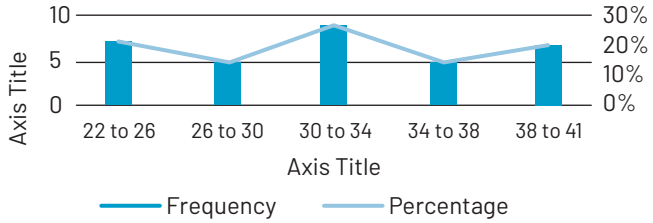

Figure 1: Age-Range of Ureteric Stones in Pregnant Women

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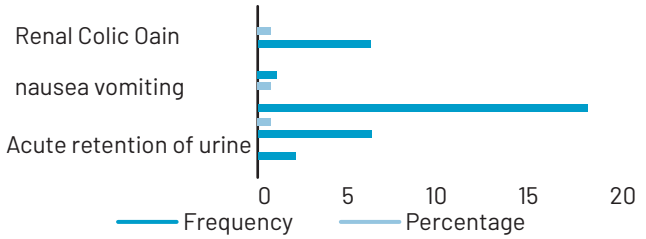

Figure 2: Clinical Symptoms of Patients with ureteric Calculi

Patients presenting during the first trimester were 4, and 2nd trimester was 17, and 12 patients were presented in 3rd trimester. Severe renal colic pain was observed in 6 patients(18%) and haematuria was presented in 6 patients (18%), nausea vomiting in 18 patients (55%), two were presented with acute retention of urine (6%), and one patient (3%)presented with oliguria due to bilateral ureteric obstruction.

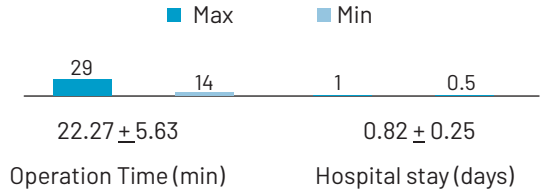

Figure 3: Details of Operation time of Patients The average time taken for the surgical procedure was 22.27±5.63 min while the maximum time noted was 29 mins and 14 mins minimum in the treatment of all the 33 cases; however, the hospital stays varied from 1 day to 6 hours with an average time taken 9.84 hours and 0.82(in days)

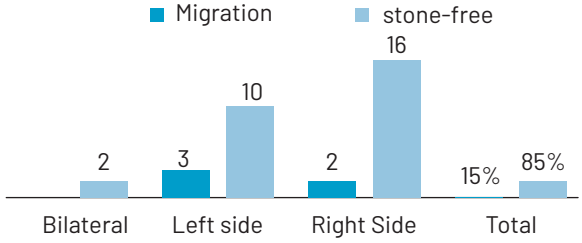

Figure 4: Post-operative Results of stone-clearance location wise

Amongst all the patients presented with renal colic pain, 18 presented with the right side, out of which 48% got stone cleared, and 6% had reported migration towards kidney. While 13 patients presented stones on the left side, 30% successful stone clearance and 9% migration, and lastly, 6% had a successful stone clearance on the bilateral side. Thus, overall stone was broken, and clearance was achieved in 28 patients (85%), and in five patients (15%), stones were pushed back and obstruction was relieved. However, no obstetric or urological complications were noted. Only temporary difficulty in urination and burning micturition in few cases were recorded.

DISCUSSION

According to studies, about 25 to 40% of pregnant patients need intervention, thus raising the need to manage ureteric stones through ureterorenoscopy or other methods. Due to the risks and sensitivity of pregnancy and fetus involvement, ureteric stone removal has, by far, proven to be the safest and effective method. In a published study (2008), the meta-analysis conducted on 108 subjects,ureterorenoscopy treatments were considered safe and efficient [13]. Commonly the rate of stone clearance in pregnant women is higher approximately 80% of the cases are treated clinically. Furthermore, the witnesses' complication rates of URS are low as reported in studies of Semins and colleagues; out of 108 patients, 14 reports showed a complication rate of 8.3% is similar in results in contrast to non-pregnant women. Additionally, Ureterorenoscopy is also reported to be less costly a technique [14]. In our study, the patients' mean age is calculated as 31 years (standard deviation: 5.71; range: 22-41years). While the most repeated age groups were 30-34 years (27%) each, however, the gestation period is varying from 8 weeks (1st trimester) to 33 weeks (3rd trimester). The comparative study reported 25.5±4.6 years (range 16–41 years), and the gestation period of 9 to 36 weeks [15]. Semin and colleagues found a 67.9%, 63.4%, and 66.5% clearance rate in the upper, mid, and lower ureter [16]. While in our study amongst all the patients presented with renal colic pain, on the right, left, and bilateral side; an overall stone was broken, and clearance achieved in 28 patients(85%) and five patients (15%) stones were pushed back, and obstruction was relieved. However, no obstetric or urological complications were noted [17]. Only temporary difficulty in urination and burning micturition in few cases were recorded. Some other studies show the risk of premature birth and renal colic and its complications increase early birth risk [18-21]. In our study, the average time taken for the surgical procedure was 22.27±5.63 min in the treatment of all the 33 cases; however, the hospital stays varied from 1 day to 6 hours. The stone size ranged from 0.4cm to 1.2cm, with a mean size of 0.95 cm. In similar works on 128 pregnant women suffered from acute renal colic/ ureteral calculi of Foshan Maternal and Child Health Hospital, the success rate was 83 to 96%. Abdel-Kader reported ureterorenoscopy conducted on 17 women with stone-free rate to be 100% [22,23].

CONCLUSION

Thus, we can define ureterorenoscopy as a preferred first-line treatment that is harmless and effective for treating obstructive ureteric stones during pregnancy.

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