

Ureteral Stent Insertion in Pregnants with Intractable Flank Pain: A Clinical Experience

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ABSTRACT

Objective: To evaluate the efficacy of JJ stent placement in pregnant with intractable flank pain.

Methods: Pregnants with flank pain who referred to our clinic between January 2011 and March 2016 were retrospectively reviewed. Patients who did not respond to first conservative treatments and hospitalized were enrolled into the study. Demographic datas, clinical and laboratory findings, surgical interventions such as JJ stenting or percutaneous nephrostomy as well as the complications were all recorded and evaluated.

Results: Forty-one pregnant women were included in the study. No surgical intervention was required in 7 (17%) after second conservative management. 34 patients with intractable flank pain were required JJ stenting/nephrostomy. The mean duration of hospitalization was 2.9±2.7 days. Complications such as migration (n=3), lower urinary tract symptoms (n=1) and hematuria (n=2) were observed in stent applied cases. According to the postpartum imaging (abdominal CT scan) 5 of 32 patients required any additional stone surgery.

Conclusion: JJ stent placement in an emergency based manner was found to be effective and safe with low complication rates in the management of pregnant with intractable flank pain.

INTRODUCTION

Renal colic is a rare but important condition that can cause adverse effects for both the mother and the fetus, which can require hospitalization and invasive treatment during pregnancy.^[1] Renal colic is also the most common nonobstetric reason for hospitalization during pregnancy.^[2] Urolithiasis is one of the main causes of renal colic in pregnant.^[3,4] The physiological dilation of the urinary tract may become symptomatic during pregnancy.^[5] Hydronephrosis is the main finding of the presence of renal obstruction due to physiologic dilatation or ureterolithiasis. Ultrasound (US) is the safest imaging method to determine the presence of obstruction^[6] and choice for routine evaluations with its radiation-free property in pregnancy with renal colic. However it can remain incapable to differentiate ethiological factors that pregnancy induced hydronephrosis and lithiasis.

Conservative treatment including hydration, antibiotics

and analgesia represent the first-line therapy for renal colic during pregnancy.^[7] If conservative therapy fails or patients have any of conditions that febrile urinary tract infections, sepsis, obstructive uropathy, obstruction of a solitary kidney or acute renal failure,^[8] surgical intervention may needed.

In our study we aimed to evaluate the efficacy as well as the safety of JJ stent placement in pregnant women presenting with persistent renal colic attacks.

MATERIAL AND METHODS

Pregnant women with symptomatic hydronephrosis (renal colic) who referred to our outpatient clinic were retrospectively reviewed between January 2011 and March 2016. All patients were treated by conservative management including hydration, analgesics and use of antibiotics in case of bacteriuria as a first intervention. Patients who did not respond to conservative treatment were hospital-

ized. Second conservative management included hospitalization with bed rest, intravenous hydration together with analgesics and antibiotics when bacterial infections were present. The patients who didn't respond these therapies were defined as an intractable flank pain. The hospitalized patients were included in this retrospective cohort study program.

Files of these cases were evaluated with respect to the age, pregnancy week, presenting symptoms, history of stone disease, degree of hydronephrosis, management as well as hospitalization period in a retrospective manner. White blood cell (WBC) count, urinalysis, urine culture and renal sonography were done in all patients at the first visit, and were repeated according to clinical findings. Pyuria was considered as >10 WBCs/mm³ of urine.^[9] Bacteriuria was defined according to Schaeffer.^[10]

The urological interventions such as ureteral stent insertion or percutaneous nephrostomy (PCN) were performed when conservative therapy failed or in case of febrile urinary tract infections, sepsis, obstructive uropathy, acute renal failure or obstruction of a solitary kidney. Both interventions were applied under local anesthesia or sedo-analgesia. Intraoperative US was used to confirm the placement of the upper portion of the JJ stent. It was removed 3-6 weeks after delivery and control renal screening was performed 2-4 weeks after catheter removal by using CT scan. Catheter replacement was performed in patients with a 3-month-long catheterization period. Additionally the complications of JJ stent placement, urinary system findings during post-partum period (presence of stone) as well as additional procedures were all recorded and evaluated.

Statistical Analysis

Statistical analysis was performed with SPSS 22.0 (IBM® SPSS® Statistics V22.0, 2013, USA). All data were reported as mean value±standard deviation, frequency and percentages.

RESULTS

Forty-one pregnant women were included in the study. Mean age of the patients was 24.2 ± 5.3 years and mean gestational week was 25.2 ± 6.2 . All patients had flank pain and hydronephrosis. Renal stones larger than 5 mm were observed in 9 patients (22%) by first visit US imaging. All patients demographic and clinic data are given in Table 1. No surgical intervention was required in 7 (17%) patients who had relief on symptoms after second conservative management (parenteral treatment). Overall 34 patients with intractable flank pain required surgical intervention. The most common indication was intractable pain (34/34),

with 14 requiring it for acute pyelonephritis (14/34) and 1 for anuric acute renal failure with solitary kidney(1/34). Ureteral stent was inserted into 31 patients unilaterally while only 2 patients had bilaterally. There was one patient treated with percutaneous nephrostomy (PCN) because of the failure of ureteral stent placement. Nearly all (33/34) ureteral stent attempts were successfully completed. Clinical presentation and treatment of methods are given in Table 2. The mean duration of hospitalization was 2.9 ± 2.7 days. The median value for the stenting period in patients was 13 (1-30) weeks. Complications such as migration (n=3), lower urinary tract symptoms (LUTS) (n=1) and hematuria (n=2) were observed in stent applied cases. Migrated JJ stents were switched by the new catheter in 2 patients. The other one was also removed due to patient's unwilling to switching procedure. 3 patients with hematuria and LUTS were observed in two weeks after placement of stent and they were managed conservatively. Complication rates in stenting patients are given Table 3. No pregnancy complication was noted in any of the patients, and all of the fetuses were delivered without complications. According to the postpartum imaging (abdominal CT scan) of 31 patients with JJ stent and 1 patient with percutaneous nephrostomy to investigate the requirement of additional intervention; ureteral stones were found in 2 (6%) patients, kidney stones were found in 7 (22%) patients and both ureter and kidney stones were found in 1 (3%) patient and no stone was found in 22 (69%) patients. 2 patients with stent were excluded because of the lack of the final imaging. Overall 5 of 32 patients required any

Table 1. Demographic and clinic data of patients

Parameter (n=41)	n (%) / Mean±SD
Age (year)	24.2±5.3
Pregnancy week	25.2±6.2
Trimester on presentation	
First	4 (10)
Second	17 (41)
Third	20 (49)
Positive history of urinary calculus	7 (17)
Preoperative Ultrasound findings	
Presence of hydronephrosis	41 (100)
Grade 1 and 2	33 (80)
Grade 3 and 4	8 (19)
Laterality of hydronephrosis	
Left	6 (15)
Right	30 (73)
Bilateral	5 (12)
Presence of stone in any kidney (5 mm<)	9 (22)

Table 2. Clinical presentation and treatment methods for renal colic during pregnancy

Symptoms and findings	n (%)
Flank pain	41 (100)
Acute pyelonephritis (Fever+pyuria/bacteriuria+pain)	14 (34)
Anuric acute renal failure	1 (2)
Intervention	
Ureteral JJ stent	33 (81)
Nephrostomy	1 (2)
Conservative	7 (17)

Table 3. Complication rates in stenting patients

Presence of complication n (%)	JJ stenting patients (n=33)
Migration	3 (%9)
LUTS	1 (%3)
Hematuria	2 (%6)
Total	6 (%18)

additional intervention. Uretorenoscopy (URS) plus laser lithotripsy was used as the main treatment (n:3, 9%), while percutaneous nephrolithotripsy (PNL) (n:1, 3%), extracorporeal shock wave lithotripsy (ESWL) (n:1, 3%) were also used as definitive treatments.

DISCUSSION

Conservative treatment represent the first-line preferred therapy for renal colic during pregnancy.^[7,11] There is need for surgical intervention such as ureteral stent insertion, URS or PCN when conservative treatment fails. In our present study showed JJ stent placement in an emergency based manner was found to be a safe and effective approach with its very low complication rates in the management of pregnant women presenting with intractable flank pain and hydronephrosis.

The physiologic dilatation of the urinary tract in pregnancy may become symptomatic and if left untreated it can result in severe renal infection and urinary sepsis that may threaten the life of either the mother and baby.^[5] The condition that progressing of asymptomatic bacteriuria to symptomatic infection may be due to presence of hydronephrosis during pregnancy. Stasis may also make a

contribution of stone formation in the urinary collecting system.^[12]

US has some advantages such as non-invasiveness, ready availability and lack of radiation exposure^[1] but it has limited sensitivity to detect stones and visualise the ureter. So it's difficult to differentiate the causes of renal obstruction.^[13] Sensitivity of US was reported 38% to 95%.^[14-16] In our study, ultrasonography visualized at least a renal stone in 22% of cases. US is still the first-line imaging method to determine hydronephrosis in pregnant women. The presence of an ureteral stone with symptomatic hydronephrosis during pregnancy is a rare condition, affecting about 1 in every 1500 to 3000 pregnancies^[14,16] it's a similar probability of occurring in a non-pregnant woman.^[17] The major limitation of our study is inadequacy of US imaging to detect stone incidence during pregnancy. For this reason, we determined stone incidence by using postpartum CT imaging. According to these images, ten of 32 patients (31%) had stone disease, five of total 41 patients (12%) also received definitive treatments for urinary stone disease including URS and laser lithotripsy (n=3), PNL (n=1) and ESWL (n=1).

Physiological hydronephrosis is more common on the right side due to the uterus enlargement on the right side and a dilated uterine vein compressing the right urinary tract^[18,19] in contrast, sigmoid colon protect left ureter from the compression. Andreoiu et al.^[1] found larger proportion of right-sided hydronephrosis due to uterine compression while left-sided colic is more likely to indicate the presence of a stone. Our study confirms that the incidence of right sided hydronephrosis is much common than the left side.

Some studies in the literature showed that the success rate of conservative treatment in patients with symptomatic hydronephrosis was 92.9-94%.^[5,20] Unlike these studies our success rate was found to be 17%. This may be due to not including the patients that treated with first conservative therapies in our outpatient clinic.

Indications of drainage in pregnant with hydronephrosis are unresponsiveness to conservative therapies (ongoing sepsis despite antibiotherapies) and any impairment of renal function, pain and obstruction.^[21] In our present study, drainage is needed in 34 of patients. Fainaru et al. stated that mean duration of hospitalization was 5.3 days in a similar study,^[20] while in this study the mean duration was 2.9 days. The reason of longer duration of hospitalization may be due to the conservative treatment was applied more than 90% of the patient, while shorter duration in our study may be related to progressive healing after invasive treatment such as ureteral stenting. The quality of life and pain scoring in patients can be shown as a lack of study because of the retrospective design but the short duration of hospitalization can be shown as a proof of the dramatic re-

response to treatment. Urinary infection rates with symptomatic hydronephrosis in pregnancy were found in 22.9%^[22] and 28%^[23] of patients. Similarly in our study, this rate was found to be 34% and ureteral stenting were performed in these cases. The stent placement may have some complications like catheter migration, stent irritation, stent encrustation, haematuria, ascending pyelonephritis caused by vesico-urethral reflux and stone formation.^[24–28] The overall complication rate of JJ ureteric stenting, i.e. stent migration, LUTS and hematuria, was found to be 18% in this study that similar with the other series (6–37%) We also found that most of the cases were occurred after mid-pregnancy as expected.^[11] Tortuosity of ureter that is likely occurred in late pregnancy may limit the placement of JJ stenting.^[29] Although most of our patients were in third trimester, nearly all patients had successful stenting.

In this study, there was no need for ureteroscopy in any patient thereby all surgical procedures were performed under local anesthesia or sedo-analgesia. Although ureteroscopy and holmium laser lithotripsy can be used safely for diagnostic and therapeutic purposes during pregnancy,^[30] it should be considered that drugs used in general anesthesia such as halothane, nitric oxide are used in many procedures,^[1,30,31] and reported as pregnancy category 'C' and still has unknown effects on the fetus.

CONCLUSION

In the light of our findings and the available literature data as well, JJ stent placement in an emergency based manner was found to be a safe and effective approach with its very low complication rates in the management of pregnant women presenting with conservative therapy resistant (intractable) flank pain.

Ethics Committee Approval

Retrospective study.

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Conflict of Interest

None declared.

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İnatçı Flank Ağrısı Olan Gebelerde Üreteral Stent Uygulanımı: Klinik Deneyimlerimiz

Amaç: İnatçı flank ağrısı olan gebe hastalardaki JJ stent uygulanmasının güvenilirliğini ve etkinliğini değerlendirmeyi amaçladık.

Gereç ve Yöntem: Ocak 2011 ve Mart 2016 tarihleri arasında flank ağrısı nedeniyle başvuran, birincil konservatif tedavilere cevap vermeyen ve bu sebeple kliniğimize interne edilen hastalar retrospektif olarak tarandı. Hastaların yaş, gebelik haftası, başvuru semptomları, taş öyküsü, hidronefroz derecesi, uygulanan tedavi şekli ve yatış süreleri yanında JJ stent ya da perkutan nefrostomi uygulanan hastalar ve komplikasyonlar kaydedildi.

Bulgular: Çalışmaya 41 gebe hasta dahil edildi. 7 hasta ikincil konservatif tedavilere yanıt verdi ve tedavi sonrasında ek bir girişim ihtiyacı duymadı. Tedaviye yanıt alınamayan ve inatçı flank ağrısı olarak değerlendirilen 33 hastaya JJ stent, 1 hastaya ise JJ stent takılmaması üzerine perkütan nefrostomi kateteri uygulandı. Ortalama hastane yatış süreleri 2.9 ± 2.7 gündü. Stent uygulanan olgularda migrasyon (n=3), alt üriner sistem semptomları (n=1) ve hematüri (n=2) gibi komplikasyonlar izlendi. 32 hastanın postpartum dönemdeki görüntülemelerine göre; 5 (%15) hastada taşa yönelik ek girişim uygulandı.

Sonuç: Mevcut literatür bilgileri ile bulgularımız ışığında inatçı flank ağrısı ile başvuran ve renal dilatasyon saptanan gebe hastalarda JJ stent uygulaması etkili ve düşük komplikasyon oranları ile güvenli bir yaklaşım olarak tespit edilmiştir.

Anahtar Sözcükler: Gebelik; flank ağrısı; hidronefroz; JJ sten.