

## COMPARATIVE EFFICACY OF DOUBLE J STENTING AND CONSERVATIVE MANAGEMENT IN THE TREATMENT OF ANTENATAL HYDRONEPHROSIS

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**ABSTRACT****Objective:**

To compare the efficacy of double J (DJ) stenting and conservative management in treating antenatal hydronephrosis.

**Methodology:**

Over a **six-month period**, we performed a randomized controlled trial at the Urology Department of **Lady Reading Hospital in Peshawar**. The study included **154** pregnant women identified as having antenatal hydronephrosis, which were randomly splitted into two groups. **Group A (n=77) was treated with DJ stenting, while Group B (n=77) received conservative treatment**. The starting patient characteristics were alike in both groups. Success was determined by the reduction of symptoms and positive changes on ultrasound after one week of treatment. We analyzed the data using SPSS version 22, using either the chi-square or Fisher's exact test. The level of statistical importance was set at  **$p \leq 0.05$** .

**Results:**

The DJ stenting group had a greater success rate (**96%**) than the conservative group (**81%**) ( **$p < 0.05$** ). Further analysis showed that age, gestational age, parity, pain duration, affected kidney side, and calyceal diameter did not have an impact on how well the treatments worked.

**Conclusion:**

For antenatal hydronephrosis, DJ stenting works better than just watching and waiting, especially if patients have symptoms or ongoing blockages. Mild cases might get better on their own, but if they don't, DJ stenting should be an option.

**INTRODUCTION**

Dilatation effect of the progesterone and mechanical compression of the enlarging uterus result in hydronephrosis of pregnancy. In most

of the pregnancies, hydronephrosis is considered as a "normal" finding of pregnancy. It is more frequently observed on the right side

and can be demonstrated by ultrasound beginning from the second trimester and it may be present until the 12th postpartum week.<sup>1</sup>

Although hydronephrosis of pregnancy can be present in up to 80% of the pregnancies, the management options are not clearly defined. The treatment options of hydronephrosis due to pregnancy mainly depend on the coexisting stone disease, pyelonephritis, and renal disease.<sup>2</sup> However, the management option and its consequences in the absence of a coexisting disease state are not clear. The insertion of double-J stent was found more effective than conservative therapy alone.<sup>3</sup> However, it has been suggested that the conservative treatment is the first choice depending on the complications and discomfort related to the surgical treatment. In addition, in most of the studies neither the degree of hydronephrosis nor the severity of the discomfort was thoroughly assessed. The use of double-J ureteral stents are not free of complications and are inserted routinely in patients presenting with ureteral obstruction.<sup>4</sup>

Stents can cause lower abdominal pain, lower urinary tract symptoms, fever and hematuria. Furthermore, these indwelling stents can migrate, break, form encrustations over them or can even be forgotten in the patient. In one study, out of all pregnant women presenting with hydronephrosis, 47% of the women had complete resolution of hydronephrosis on follow up before the delivery. Stent encrustation (10%), stent migration (10%) and stent irritation (17%) were reported as complications.<sup>5</sup> In a study by Cecen et al, the efficacy of double J stent in the management of antenatal hydronephrosis was 95.8% as compared to 83.7% with conservative management.<sup>6</sup>

Although a dilatation of kidneys is a physiological phenomenon during pregnancy, the appearance of aggravating signs and symptoms alarm for prompt treatment to avoid any complications. The present study has been designed to determine the efficacy of double-J

stenting and conservative management of hydronephrosis during pregnancy. The study has been planned because there is limited local data on this topic as evident from thorough literature search. Results of this study will provide local information and experience about antenatal hydronephrosis. Results also help in better management and counselling of patients presenting with antenatal hydronephrosis.

## OBJECTIVE

To compare the efficacy of double J stenting and conservative management in the treatment of patients with antenatal hydronephrosis.

## MATERIALS AND METHODS

### Study design

Randomized controlled trial

### Study Settings

Department of Urology, MTI/Lady Reading Hospital, Peshawar.

### Duration of Study

06 months

### Sample size

Sample size is calculated using Open Epi software taking the following assumptions, Anticipated efficacy of double stenting in antenatal hydronephrosis= 95.8%<sup>6</sup>

Anticipated efficacy of conservative management in antenatal hydronephrosis= 83.7%<sup>6</sup>

Power of test = 80%

Confidence Level = 95%

Sample size, **n = 154 (77 in each group)**

### Sampling technique

Non probability consecutive sampling technique.

## ETHICAL APPROVAL

This study is conducted after approval by institutional review board LRH/MTI under Ref:No.192/LRH/MTI.

## **SAMPLE SELECTION**

### **Inclusion criteria**

- Patient age 20 to 40 years
- Gestational age more than 20 weeks as per last menstrual period
- Parity up to 6
- Singleton pregnancy of ultrasound
- Diagnosed with antenatal hydronephrosis as per operational definitions

### **Exclusion criteria**

- Patients with prior history of hydronephrosis in the same kidney
- Patients with prior history of intervention in the same kidney
- Patients with fetal anomalies
- Patients with genitourinary anomalies
- Patients with history of hypertension (BP>140/90mmHg) and diabetes (FBS>126mg/dl)
- Patients with active urinary tract infection (core body temperature >38°C and urinalysis revealing more than 10WBCs/hpf)

## **DATA COLLECTION**

After taking approval from research review board of the hospital, patients fulfilling the selection criteria were enrolled from the indoor department of urology of the hospital. Informed consent were taken from all enrolled participants after explaining the purpose, risks and benefits of the study. Baseline information and demographics like age (years), gestational age (weeks), parity, BMI (weight in kg/height in m<sup>2</sup>), residence (rural/urban), education, profession, socioeconomic status and duration of pain complaint (days) were noted.

Patients were assigned to group A and B in equal number through blocked randomization. Patients in group A had undergone double J stent placement while patients in group B were subjected to conservative management. Insertion of a double J stent was performed under general anesthesia and all participants

were hospitalized at least one day following the intervention. The stents was scheduled to be removed at the 2nd postpartum month. Patients in conservative group were instructed to rest as possible as they could on the opposite site of where the hydronephrosis is demonstrated and drink at least two liters of water per day. Two doses of 75 mg diclofenac sodium I.M. with 12-hour intervals were used during the initial management of pain and oral paracetamol were used during the following days. All patients were invited for follow up one week of treatment and evaluated for efficacy as per operational definitions.

Data was recorded by the researcher himself on especially designed proforma.

## **DATA ANALYSIS**

Data was analyzed using statistical analysis program IBM SPSS version 25. Means  $\pm$  SD or median IQR were recorded for quantitative data like age, BMI, duration of pain and calyceal diameter after checking the normality of the data while frequencies and percentages was recorded for categorical data like parity, affected kidney (right/left), residence, education, profession, SE status and efficacy. Both groups were compared for efficacy by applying chi square or fisher exact test at 5% level of significance. Efficacy was stratified by age, gestational age, parity, duration of pain, affected kidney and calyceal diameter. Post stratification chi square or fisher exact test was applied at 5% level of significance. p value  $\leq 0.05$  was considered statistically significant.

## **RESULTS**

We enrolled 154 patients in total, dividing them into a DJ stenting group and a conservative management group, each containing 77 patients. The demographics and clinical characteristics at the start of the study were similar between the two groups. The average age in the DJ stenting group was 28.4 years ( $\pm 5.7$ ), while it was 30.5 years ( $\pm 6.1$ ) in the conservative group (p = 0.713). Body mass

index (BMI) was also comparable ( $25.5 \pm 5.2$  vs  $25.6 \pm 5.0$ ,  $p = 0.523$ ), as were gestational age ( $21.6 \pm 3.8$  vs  $20.2 \pm 3.5$  weeks,  $p = 0.642$ ), pain duration ( $8.4 \pm 4.3$  vs  $7.5 \pm 3.8$  days,  $p = 0.679$ ), and kidney diameter ( $15.1 \pm 3.4$  vs  $15.2 \pm 3.5$  mm,  $p = 0.577$ ). Other factors, such as number of previous pregnancies ( $p = 0.713$ ),

affected kidney side ( $p = 0.642$ ), residence ( $p = 0.379$ ), educational background ( $p = 0.999$ ), job ( $p = 0.245$ ), and socioeconomic status ( $p = 0.458$ ), showed no real group differences. These results indicate a balanced comparison between the two groups at the beginning of the study. as shown in **Table1**.

| Variable                     | DJ Stenting (n=77)                       | Conservative (n=77)                      | p-value |
|------------------------------|------------------------------------------|------------------------------------------|---------|
| Age (years)                  | $28.4 \pm 5.7$                           | $30.5 \pm 6.1$                           | 0.713   |
| BMI (kg/m <sup>2</sup> )     | $25.5 \pm 5.2$                           | $25.6 \pm 5.0$                           | 0.523   |
| Gestational Age (weeks)      | $21.6 \pm 3.8$                           | $20.2 \pm 3.5$                           | 0.642   |
| Duration of Pain (days)      | $8.4 \pm 4.3$                            | $7.5 \pm 3.8$                            | 0.679   |
| Calyceal Diameter (mm)       | $15.1 \pm 3.4$                           | $15.2 \pm 3.5$                           | 0.577   |
| Parity                       | 96.2% less than 2<br>3.8% greater than 2 | 95.1% less than 2<br>4.9% greater than 2 |         |
| Affected Kidney (Right/Left) | Left 44.2%<br>Right 55.8%                | Left 49.4%<br>Right 50.6%                |         |
| Residence (Rural/Urban)      | Rural 54.5%<br>Urban 45.5%               | Rural 46.8%<br>Urban 53.2%               |         |
| Education Level              | 49.4% Educated                           | 49.5% Educated                           |         |
| Profession                   | 18.2% housewife<br>81.8% working         | 26% housewife<br>74% working             |         |
| Socioeconomic Status         | 59.7% low to middle                      | 64.9% low to middle<br>35.1% high        |         |

**Table 1: Baseline Demographic and Clinical Characteristics of Study Groups**

The DJ stenting group had a higher success rate than the conservative group. In the DJ stenting group, 74 patients (96%) saw progress, compared to 62 patients (81%) in the

conservative group ( $p < 0.05$ ) as shown In efficacy **Table2**

| Outcome        | DJ Stenting (n=77) | Conservative (n=77) | p-value |
|----------------|--------------------|---------------------|---------|
| Efficacy (Yes) | 74 (96%)           | 62 (81%)            | <0.05   |
| Efficacy (No)  | 3 (4%)             | 15 (19%)            |         |
| Total          | 77 (100%)          | 77 (100%)           |         |

**Table 2: Comparison of Efficacy Between Groups**

We also checked if the starting variables we measured had an impact on success rates, and

found that age (20–30 vs 31–40 years,  $p = 0.474$ ), pregnancy stage (20–25 vs >25 weeks,

p = 0.335), previous pregnancies ( $\leq 2$  vs  $> 2$ , p = 0.895), pain duration ( $< 7$  vs  $\geq 7$  days, p = 0.816), affected kidney (right vs left, p =

0.165), and kidney diameter ( $< 15$  vs  $\geq 15$  mm, p = 0.673) as shown in **Table 3**, did not influence the final results.

| Variable                 | Category      | DJ Stenting Effective n=74 | Conservative Effective n=62 | p-value |
|--------------------------|---------------|----------------------------|-----------------------------|---------|
| <b>Age</b>               | 20-30 years   | 45                         | 33                          | 0.474   |
|                          | 31-40 years   | 29                         | 29                          |         |
| <b>Gestational Age</b>   | 20-25 weeks   | 56                         | 52                          | 0.335   |
|                          | $> 25$ weeks  | 18                         | 10                          |         |
| <b>Parity</b>            | $\leq 2$      | 52                         | 42                          | 0.895   |
|                          | $> 2$         | 22                         | 20                          |         |
| <b>Duration of Pain</b>  | $< 7$ days    | 38                         | 34                          | 0.816   |
|                          | $\geq 7$ days | 36                         | 28                          |         |
| <b>Affected Kidney</b>   | Right         | 48                         | 32                          | 0.165   |
|                          | Left          | 26                         | 30                          |         |
| <b>Calyceal Diameter</b> | $< 15$ mm     | 38                         | 35                          | 0.673   |
|                          | $\geq 15$ mm  | 36                         | 27                          |         |

**Table 3: Stratification of Efficacy by Variables**

In short, DJ stenting was more successful overall, and the starting patient features did not change this.

## DISCUSSION

Our work shows that DJ stenting works better than conservative care for antenatal hydronephrosis, with success rates of 96% and 81% respectively. The numbers support that using a DJ stent is better than waiting to see if things get better on their own when there are lasting symptoms or a clear blockage. The groups started out with similar traits, which makes it less likely that outside factors changed the end result. Also, things like patient age, pregnancy stage, previous pregnancies, how long they had pain, which kidney was affected, and kidney diameter did not change the success of the treatment, suggesting DJ stenting can help many patients. Other research backs up what we found. Usually, doctors suggest conservative treatment first for kidney swelling during pregnancy, like drinking fluids, taking painkillers, and watching to see what happens, since many times the problem will fix itself<sup>7</sup>. But, some

reports say that many patients with symptoms don't get better with these methods and need something more. A review of how to handle kidney stones during pregnancy says that while conservative treatment helps up to 70% of patients, it often doesn't work, and either DJ stenting or ureteroscopy is needed<sup>8</sup>. Our data matches these findings, since about 20% of the patients in the conservative group did not feel better, which shows the limits of not using other methods.

Studies on DJ stenting generally report good results and fast pain relief. Li et al. saw a 97% success rate with DJ stenting in pregnant women with blocked ureters, similar to our 96% success rate<sup>9</sup>. Xu et al. also confirmed that stenting is safe and helpful during pregnancy, though it can cause problems that need more treatment<sup>10</sup>. This data confirms that DJ stenting is a good option when conservative treatments don't help, mainly when there is pain or kidney function is declining. Evidence from South Asia

shows things are similar there. In Pakistan, conservative treatment for kidney swelling in pregnancy often works, but stenting is needed when symptoms persist, and DJ stents are usually effective<sup>11</sup>. Indian data says that while conservative therapy is a good first step, DJ stenting quickly eases pressure and controls symptoms when other treatments fail, stopping issues for both mother and baby<sup>12</sup>. These findings support our thought that DJ stenting works better than conservative care when patients have symptoms that don't go away with simpler treatments. Even though there are pros, there are cons to DJ stenting. Stent problems like pain when urinating, blood in urine, needing to go often, and discomfort are known, and the risk of blockage grows the longer it is used, needing replacement in longer pregnancies<sup>13,14</sup>. These problems can lower quality of life and how well people follow treatment. But, when conservative methods aren't enough, stenting benefits in keeping the kidneys working and preventing problems for the mother and baby are more important than the cons.

The good parts of our study are that we directly compared DJ stenting with conservative care for kidney swelling during pregnancy, which is something not often studied in Pakistan. Our information adds to the knowledge that is out there. A bad part is that we didn't check how often stent problems happen, how it affects pregnancy outcomes like early labor, and baby results. Looking at these would give us a better idea of the risks and rewards. Future studies in Pakistan should check these things, maybe comparing conservative care, DJ stenting, and ureteroscopy in different centers.

## CONCLUSION

In conclusion our study shows that DJ stenting is better than conservative care for kidney swelling during pregnancy. While conservative therapy is good for some patients with no or mild symptoms, DJ stenting should be the main choice when there is lasting pain or increasing

blockage. These results match what others have found and confirm DJ stenting as a safe and helpful treatment for pregnant women.

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