

A Prospective Comparative Study of Removal of Urinary Catheter at 12 hours versus at or >24 Hours Following Elective Cesarean Section in Women

Dr Aditi Jain¹, Dr. Lata Ratanoo², Dr. Shilpa Kumari³, Dr. Neelam Bharadwaj⁴,
Dr. Pawan Agarwal⁵, Dr. Geetika Sharma⁶, Dr. Indu Gautam⁷, Dr. Harshita
Khandelwal⁸

^{1,3,8} 3rd Year Resident, Department of Obstetrics & Gynaecology, SMS Medical College and Hospital, Jaipur.

^{2,5,7} Associate Professor, Department of Obstetrics & Gynaecology, SMS Medical College and Hospital, Jaipur.

⁴ Senior Professor and Unit Head, Department of Obstetrics & Gynaecology, SMS Medical College and Hospital, Jaipur.

⁶ Senior Resident, Department of Obstetrics & Gynaecology, SMS Medical College and Hospital, Jaipur. of Dentistry Padjadjaran University, Bandung, Indonesia

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Corresponding author: Dr. Lata Ratanoo

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Abstract

Background & Objective: To compare the outcomes of urinary catheter removal at 12 Hours versus at or >24 Hours post elective cesarean section. To assess and compare symptomatic UTI, time of ambulation, length of hospital stays and need for recatheterization amongst these 2 groups.

Methods: In all patients undergoing elective primary cesarean section, Preoperative urine routine and microscopy were sent, UTI was ruled out, clinical examination was performed and were NPO at least 8 hours prior to surgery and given antibiotics. A foley catheter was inserted on the operating table immediately before starting cesarean section. Cesarean sections were performed in the usual manner under spinal anesthesia. After this, in Group 1 patients, catheter were removed 12hours post-operatively while in Group 2 it was removed 24 hours post-operatively. After catheter removal, women were encouraged to void and helped to ambulate.

Results: 2 groups were compared and the overall rates of post caesarean section urinary complaints dysuria (8.69%), urinary frequency(14.13%), urgency(10.86%), burning micturition(9.76%) were higher in 24 hours catheter removal group. The Mean duration of first Post-op voiding time (4 hours), ambulatory time(4 hours) and hospital stay(4 days) were shorter in 12 hours catheter removal group.

Conclusion: Urinary catheter removal post Caesarean section at duration of 12 hours postoperatively is associated with decreased complications and morbidity in post Caesarean section women.

Introduction

Worldwide, caesarean sections are now the most frequently performed obstetric procedures.¹ Rates of caesarean sections have been continuously rising. As a result of improved anesthetic management and the use of prophylactic

antibiotics before surgery to avoid infections, maternal mortality related to caesarean delivery is now uncommon. However, there are still some morbidities that can be avoided, such as urination problems and UTIs. To lower the risk of these

morbidities and avoid postoperative complications, interventional measures should be used.

The use of urinary catheter (flexible elastic tube used to drain urine from bladder) during and after cesarean section is routinely used.¹ Alleged benefits of using catheter includes, maintains bladder drainage that improves visualization during surgery and minimizes bladder injury, less urinary retention post-operatively but it could be associated with increased incidence of CAUTI (Catheter Associated Urinary Tract Infections), urethral pain, voiding difficulty after removal, delayed ambulation and increased hospital stay.¹

There is currently no agreement on a precise time for catheter removal. According to certain research, after a caesarean section under spinal anaesthesia, urine retention and bacteriuria occur more frequently and the catheter stays in place longer³. According to some studies, removing the urine catheter earlier may promote early ambulation and reduce the length of the hospital stay³. There were several studies suggesting that routine use of urinary catheter in all caesarean sections is not essential². Our goal is to strike a balance between the length of urethral catheterization and the benefits of early ambulation, reduced bacteriuria rates, shorter hospital stays, and decreased incidence of urine retention following surgery. Therefore, we will compare the morbidities and benefits of removing the urinary catheter after two different lengths of time in our study.

Aim and Objectives of the Study

- To compare the outcomes of urinary catheter removal at 12 Hours versus at or >24 Hours post elective cesarean section.
- To assess and compare symptomatic UTI.
- To assess and compare time of ambulation.
- To assess and compare length of hospital stay.
- To assess and compare rate of recatheterisation.

Materials and Methods

This study was a prospective study conducted over a period of 2 years and 2 months on 184 women admitted in antenatal ward for primary elective cesarean sections in the Department of Obstetrics and Gynecology, SMS Medical College, Jaipur.

Inclusion Criteria

- Those who are willing to give consent.
- Primigravidae women with term pregnancy prepared for elective cesarean section.

Exclusion Criteria

- Women who had preoperative urinary tract infections, bladder injuries during surgery.
- Women with any medical condition where post op urine output measurement is essential like Preeclampsia, eclampsia, gestational hypertension and GDM.

Methodology

Institutional review board and ethical committee clearance was taken. Women undergoing antenatal care on the basis of inclusion and exclusion criteria were selected. Informed consent of the patient was taken. A detailed assessment of patient was performed including history, general examination and obstetrics examination. Routine investigations and a mid-stream urine analysis were done to rule out UTI in preoperative patients.

Patients enrolled in the study were divided into 2 study groups: -

- ❖ **Study group** – Patients in which catheter was removed 12 HOURS postoperatively.
- ❖ **Control group** – Patients in which catheter was removed 24 HOURS postoperatively.

Outcome Measures

- Symptomatic urinary tract infections - Significant bacteriuria, presence of 10^5 CFU of bacteria per ml (clean catch midstream urine sample postoperatively 48 HOURS.)
- Other outcome measures as Dysuria (defined as painful micturition); frequency (micturition

more than 7 times during the day or more than twice during night); urgency (severe irresistible urge to micturate); burning micturition.

- Post-operative first ambulation time.
- Length of hospital stay- from day of surgery till discharge.
- Rate of re-catheterization (those who fail to pass urine >8 hrs after catheter removal).

Statistical Analysis

- Continuous variables were summarized as mean and were analyzed by using unpaired t-test. Nominal / categorical variables were summarized as proportions and were analyzed by using chi-square/ Fischer exact test. P-value <0.05 will be taken as significant.

A total of 184 women were participated in the study group. They were divide into two groups by random allocation table.

In Group I: Catheter removal was done 12hours postoperatively in 92 women.

In Group II: Catheter removal was done 24hours post operatively in 92 women.

Patient preparation:

All the women who were included in the study, preoperative urine routine and microscopy were sent and UTI was ruled out. Any patient under the exclusion criteria were excluded from the study. In all participants, clinical examination was performed. Non stress test was performed on the day of admission. Recently performed haematocrit and serology, blood grouping and typing is checked. Informed consent for cesarean section and anesthesia were obtained. They were kept nil per orally at least 8 hours prior to

surgery. Antibiotic prophylaxis of 1g injection Ceftriaxone intravenous is given 30 minutes prior to surgery after the test dose. In all women who were undergoing elective cesarean section, a foley catheter (French size 16) was inserted under sterile precautions on the operating table immediately before starting cesarean section.

Cesarean sections were performed in the usual manner under spinal anesthesia. Abdomen opened by pfannensteil incision. Then dissecting through different layers of abdomen until the uterus is reached. Uterus is closed with vicryl. Abdomen closure was done.

After this, in Group 1 patients, catheter was removed 12hours post-operatively while in Group 2 it was removed 24 hours post-operatively. After catheter removal, women were encouraged to void and helped to ambulate. Their ambulatory time was noted and their first voiding time was noted in both categories. If even after 8 hours of removal, if they are not able to void or if there is palpable bladder, recatheterization is necessary. (Urinary retention means – difficulty to void 8 hours after catheter removal or residual urine ≥ 200 ml.) In both the groups urine analysis was done 48 hours post-operatively and results were compared.

Results During the study period, a sum of 184 women finally enrolled in this trial.

Out of which, in 92 of them catheter was removed 12 hours post-operatively and in 92 women delayed catheter removal after 24 hours post-operatively was done. The two groups were matched and there were no significant differences between the two groups regarding maternal age and gestational age.

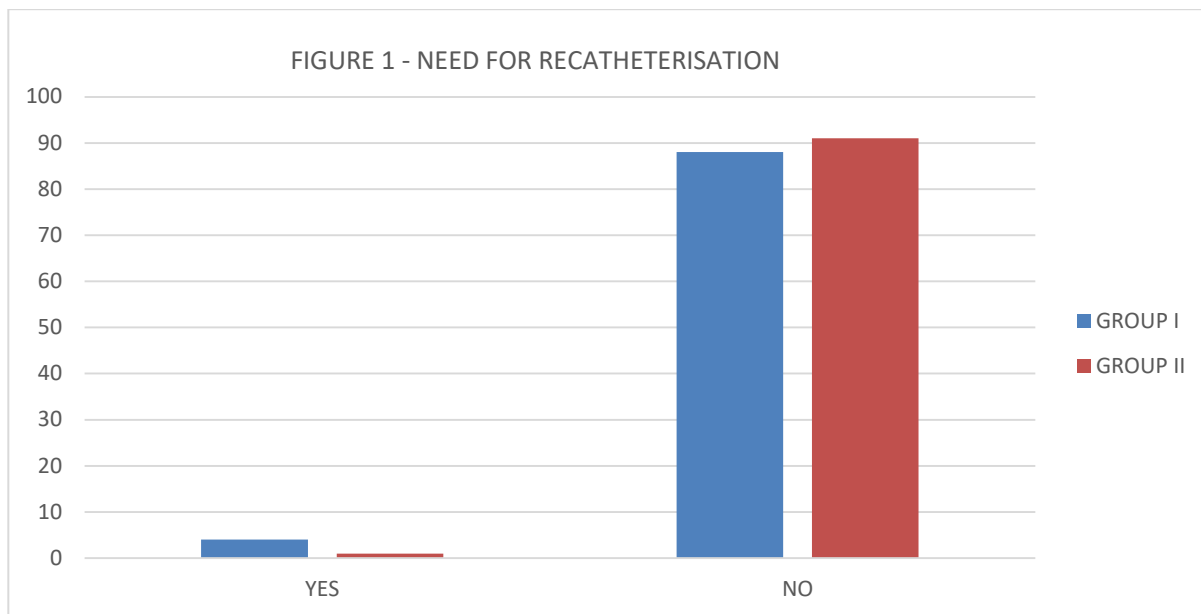


Figure 1: shows that 4 women in the 12 hours post-operative catheter removal group had urinary retention requiring re-catheterization and 1 of the women in the 24 hours post-operative catheter removal group was re-catheterized. This Difference in the need for re-catheterization in both the groups was non-significant (p-value is 0.3645).

Table 1: Distribution of Patients According to their Post-Op Urinary Complaints

	Disease present	Disease absent	Totals	Chi-square statistic	Degrees of freedom	P-value
DYSURIA = GROUP I	1	91	92	4.2057	1	0.0403
DYSURIA = GROUP II	8	84	92			
Totals	9	175	184			
URINARY.FREQUENCY = GROUP I	3	89	92	5.5446	1	0.0185
URINARY.FREQUENCY = GROUP II	13	79	92			
Totals	16	168	184			
URINARY.URGENCY = GROUP I	2	90	92	4.3682	1	0.0366
URINARY.URGENCY = GROUP II	10	82	92			
Totals	12	172	184			
BURNING.MICTURATION GROUP I	1	91	92	5.1816	1	0.0228
BURNING.MICTURATION GROUP II	9	83	92			
Totals	10	174	184			

GROUP I and GROUP II were reviewed post-operatively in view of signs and symptoms of urinary tract infections like dysuria, urinary frequency, urinary urgency and burning micturition.

As seen in Table 1 patients had the following signs and symptoms-

Dysuria - Total 9 patients had complained of dysuria out of which 8 patients were of group II. Significant difference was noted with a p-value of 0.04. Urinary frequency- Total 16 patients complained of increased frequency of urination and out of them 13 patients were of group II.

Significant difference was noted with a p-value of <0.018.

Urinary Urgency- Total 12 patients complained of urgency in micturition and out of them 10 patients were of group II. Significant difference was noted with a p-value of 0.036. Burning Micturition- - Total 10 patients complained of

burning micturition and out of them 09 patients were of group II. Significant difference was noted with a p-value of 0.022.

Post-operative urinary complications after catheter removal and symptomatic UTI were higher in group II.

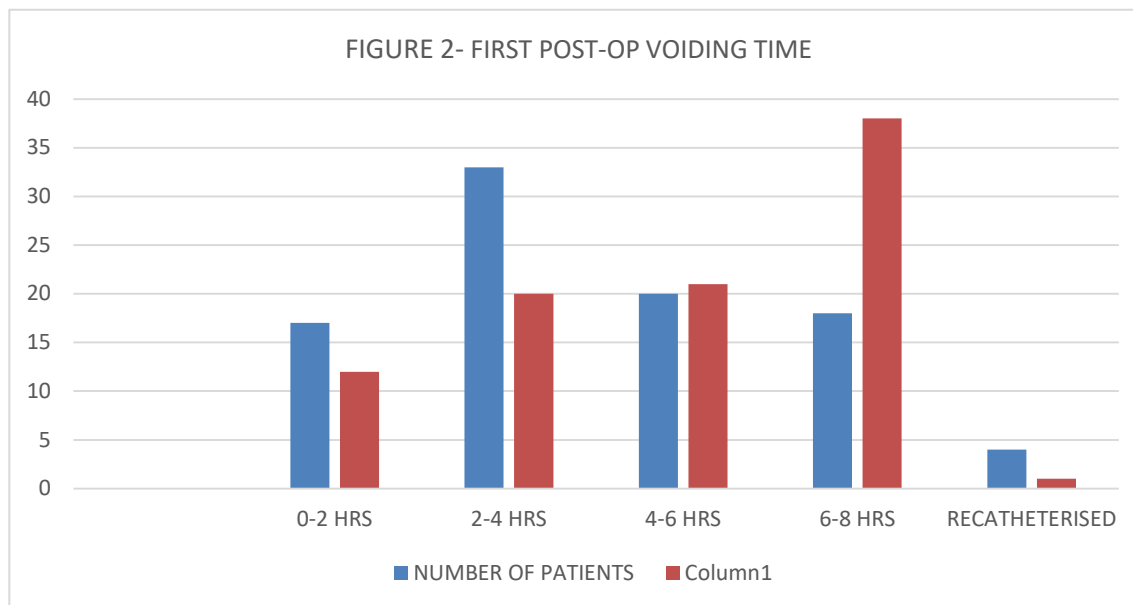


Figure 1: Distribution of Patients According To First Post-Operative Voiding Time

Mean Post-operative voiding time in 12 hours group is 4 hours whereas it is 5 hours in the 24 hours group. Statistical significant difference was noted with a p-value of 0.001.

Post-op voiding time is shorter in 12 hours catheter removal group.

Table 2: Distribution of Patients According To Their First Post-Operative Ambulation

1ST POST-AMBULATION TIME IN HRS	NUMBER OF PATIENTS	
	GROUP I	GROUP II
0-2	20	10
2-4	31	11
4-6	18	38
6-8	17	20
8-10	2	
10-12	4	13
Grand Total	92	92
P value	<0.001	Means statistically different

Mean duration of post-op 1st ambulation in patients of group I was 4 hours while in group II was 6 hours. Significant difference was noted with a p value of <0.001. Ambulation period was shorter than in 12 hours catheter removal group.

Mean duration of hospital stay in GROUP I was of 4 days, whereas in GROUP II it was of 5 days.

P-value of <0.001 was noted and therefore duration of hospital stay is significantly shorter in 12 hours post-operative catheter removal group.

Table 3: Distribution of Patients According To Post-Operative Bacteriuria

POST OP BACTERIURIA RESULTS	NUMBER OF PATIENTS	
	GROUP I	GROUP II
NEGATIVE	90	81
POSITIVE	2	11
Grand Total	92	92

Post-operative bacteriuria was noted in 11 patients of the group II and only 2 patients of group I. Significant difference was seen with p-value of 0.0214.

Discussion

This study is undertaken to determine whether 12 hours post-op catheter removal decreases the occurrence of urinary tract infection, shortens first postoperative voiding time, ambulation time, duration of hospital stay and the need for recatheterization for urinary retention.

In this study, women admitted in the common labour room ward for elective cesarean section were selected after screening for eligibility and consent was taken and complete physical and obstetric examination was done. A pre-operative urine routine and microscopy was done along with other blood investigations. Total 184 women participated in the study and in all participants foley catheter was inserted by resident doctor prior to caesarean section.

In Group I: In 92 women catheter removal was done 12hours postoperatively. In Group II: In 92 women catheter removal was done 24 hours postoperatively.

In the present study, we compared the age group, parity and gestational age between the two groups and they were matched and there is no significant difference.

Indication for CS-

In our study, 28.2% and 30.4% C.S. were due to malpresentation in group I and II respectively, 8.6% and 11.9% C.S. were due to cephalopelvic disproportion respectively, 17.3% and 15.2% C.S. were due to abnormal cardiotocography findings, 19.5 % and 21.7% C.S. were due to oligohydramnios.

About 26% of patients of group I and 20.65% patients of group II had Other indications for CS of which maternal request and contracted pelvis were most common.

About 11.10% and 13.40% patients had malpresentation in Khaled et al⁴ study while 10.9% and 13.4% patients had malpresentation as indication in Ahmed et al study⁶.

Similarly 19.7% and 19.4% patients had CPD in Khaled et al⁴⁶ study and about 26.2% and 19.4% in Ahmed et al⁶ study.

Need for recatheterization-

It was evident in our study that only 1.08% of group II required recatheterization for urinary retention in comparison to 4.30% patients of group I. No statistically significant difference was found between 2 groups. Emeka et al study showed about 7.3% and 0% need for recatheterization in 8 hrs catheter removal group and 24 hrs catheter removal group respectively, P value = 0.001 . Similar to our study results Alper Basbug et al⁶ study showed about 4.8% and 1.3% need in 2hrs versus 12hrs catheter removal group, results were not statistically significant with P value of 0.59.

Post-op urinary complaints-

In our study 4 most common complaints related to UTI were taken into consideration, these were dysuria, urinary frequency, urinary urgency and burning micturition. In our study, dysuria was seen 1.08% and 19.5% in group I and group II respectively. Similarly, in Khaled⁴ Study dysuria was seen in 1.20% in 6 hrs post op catheter removal group and 17.90% in 24 hrs postoperative catheter removal group. Increased urinary frequency was noted in 3.20% and 14.1% in group I and group II respectively. Similarly, in

Ahmed 5 study urinary frequency was seen in 1.30% in 8 hrs post catheter removal group and 22.30% in 24 hrs catheter removal groups.

Urinary urgency was noted in 2.17% and 10.86% in group I and group II respectively. Similar results were noted in Khaled⁴⁶ study in which urinary urgency was seen in 1.20% in 6 hrs post Caesarean catheter removal group and 19.40% in 24 hrs post Caesarean catheter removal group.

Burning micturition was noted in 1.08% and 9.78% in group I and group II respectively. In Emeka study ,bacteriuria was seen in 3.3 % in 8hrs catheter removal group and 6% seen in 24 hrs catheter removal group ,results were statistically insignificant with P value of 0.274.

So it was seen that post-op urinary complaints were significantly more in 24 hours post-op catheter removal group.

Post-op ambulation-

In our study mean post-operative ambulation time in group I was 4 hours while in group II it was 6 hours. Significant difference was seen showing that 12 hours catheter removal group patients were able to ambulate earlier. Similar results were seen in Alper basbug⁶ study where mean (SD)duration of post op first ambulation time in early catheter removal group was 6.41+/-1.87 hrs and 8.08+/-3.48 hrs in delayed Catheter removal group.

Duration of hospital stay-

In our study, mean duration of hospital stay was 4 days and 5 days in group I and group II respectively. Statistically significant difference was seen showing that 12 hours catheter removal group patients had shorter duration of hospital stay and was discharged earlier. Similar results were seen in Divya Pandey et al⁷ study in which mean (SD) duration of hospital stay of non-catheterised patients was 3.99+/- 1.28 days and 5.2+/- 2.43 days in patients catheterised for 24 hrs.

Post-op bacteriuria-

Mid-stream urinary samples were collected 48 hours post-operatively and tested for leucocyte esterase test and nitrite test which in-turn reflected the presence of bacteria in urine.

Bacteriuria was seen in 2.17% and 11.95% patients of group I and group II respectively.

Statistically significant difference was seen showing that 12 hours catheter removal group patients had lesser incidence of UTI as compared to 24 hours catheter removal group. Emeka study showed bacteriuria of 3.3% in 8 hrs post Caesarean catheter removal group and 6% in 24 hrs group. Divya Pandey⁷ study showed urine culture positive bacteriuria in 4% of non catheterised patients and 29.3% of patients with 24 hrs post Caesarean catheter removal group.

Conclusion

Thus it is concluded from the above study that urinary catheter removal post Caesarean section at a duration of 12 hours postoperatively is associated with less urinary symptoms (symptomatic bacteriuria) ,early ambulation, earlier post op voiding time less rates of bacteriuria and therefore reduced hospital stay and less postoperative complications thereby resulting in decreasing morbidity in post Caesarean section women.

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