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# CAESAREAN SECTION AND BLADDER INJURY

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**Abstract**

***INTRODUCTION****: Cesarean section is a live saving procedure but when performed without appropriate indications can add risk to both mother and baby. As per WHO report, at population level, Cesarean section rates higher than 10% are not associated with reductions in maternal and new-born mortality rates. In India as per District level household survey 3 (DLHS) Cesarean section rate is 28.1% in private sector and 12% in public sector health care facilities. The close embryonic development and anatomical proximity of the urinary bladder and genital organs, are responsible for the urinary tract to injury during surgical procedures in the female pelvis. During LSCS bladder injury is demonstrated by the presence of gas filling up the Foley bag or visibly bloody urine in the Foley bag. Veress needle injuries and other small injuries to the bladder can be successfully managed conservatively by catheter drainage for seven to 14 days followed by cystography while large bladder injuries, such as from 5 or 10 mm trocar or surgical dissection usually require suturing the injuries closed. Risk factors for bladder injury during LSCS include previous operations, expodure to radiation, malignancy, chronic infection, and inflammation.*

***MATERIAL AND METHODS****: In suspected cases of bladder injuries cystogram X-ray of the bladder after injection of contrast medium is performed. For extraperitoneal injuries (grade 2) without complicating factors, treatment is a insertion of Foley catheter for 7 - 14 days. grade 3 to grade 5 injuries generally require operative repair. Closed suction drains should be left in place after repairs. Suprapubic tube placement is not necessary in most cases. For injuries to the ventral bladder, dome, or posterior bladder, the mucosa is closed in a running fashion using 3-0 vicryl followed by a seromuscular running suture of 2-0 vicryl. The bladder is irrigated to ensure a watertight closure. A third layer in a Lembert fashion can be used in cases at high risk for fistula formation or when a leak is identified. In the laparoscopic setting, a one-layer closure is performed using 2-0 vicryl to close all layers of the bladder. An additional layer can then be added using a 2- 0 vicryl in a Lembert fashion for more extensive injuries.*

***RESULTS****: There were 986 LSCS done in the department of Obstetrics and gynaecology in the given study period. Of which 14 were diagnosed with the bladder injuries during. Among all patients who suffered from bladder injury, 3 cases were primigravida and 11 were multigravida type. Out of 14injuries, 10 injuries were repaired in 2 layers by vicryl 2.0 without insertion of SPC (suprapubic cystectomy) whereas 4 injuries were repaired by primary repair with vicryl 2.0 with insertion of SPC. In post-operative period patients were monitored for vitals, urine output and stitch sites of wounds. No complications were found in 13 patients post operatively and Foleys catheter and SPC catheter were removed after 12 days of operation in those patients.*

***CONCLUSION****: 1.4% of the bladder injuries were observed. Early detection and prompt management of bladder injury can decrease the morbidity and mortality in LSCS cases*

## Introduction

Cesarean section is a live saving procedure but when performed without appropriate indications can add risk to both mother and baby. As per WHO report, at population level, Cesarean section rates higher than 10% are not associated with reductions in maternal and new-born mortality rates[i].In India as per District level household survey 3 (DLHS) Cesarean section rate is 28.1% in private sector and 12% in public sector health care facilities[ii]. This survey shows that Cesarean deliveries in institutional births have increased randomly in India, especially in private sector health care sectors. Also it has been shown that there are various reasons for increase in

Cesarean section like patient's preferences, social norms, fear of vaginal delivery[iii], [iv].

The close embryonic development and anatomical proximity of the urinary bladderand genital organs, are responsible for the urinary tract to injury during surgical procedures in the female pelvis[v].

In gynecologic surgery, bladder injury commonly occurs during abdominal hysterectomy. Bladder can be managed by a two- or three-layer closure with absorbable suture and Foley catheter bladder drainage and bladder filling with blue-colour saline again makes bladder injury diagnosis easier[vi].

During LSCS bladder injury is demonstrated by the presence of gas filling up the Foley bag or visibly bloody urine in the Foley bag. Veress needle injuries and other small injuries to the bladder can be successfully managed conservatively by catheter drainage for seven to 14 days followed by cystography while large bladder injuries, such as from 5 or 10 mm trocar or surgical dissection usually require suturing the injuries closed[vii].

Risk factors for bladder injury during LSCS include previous operations, expodure to radiation, malignancy, chronic infection, and inflammation. Sometimes unrecognized bladder injury usually present clinically in the early postoperative period. Signs and symptoms of unrecognized bladder injury can be drainage from a surgical incision, increased output from surgical drains, vaginal leakage, apparent oliguria, and urinary ascites[viii].

**MATERIAL AND METHODS**

Present study was carried out in the dept. of General Surgery in collaboration with Dept. of OBGY at Ananta Institute of Medical Science and Research Centre Rajsamand. This study was done in the department of Gynaecology in collaboration with department of surgery. This was a Prospective interventional study. Written informed consent from all the participants was taken.

There were 986 LSCS done in the department of Obstetrics and gynaecology in the given study period. Of which 14 were diagnosed with the bladder injuries during.

Diagnosis of the injuries to bladder was as follows

Staging of the bladder injuries[ix].

Grade 1: contusion, intramural hematoma or partial thickness laceration

Grade 2: extraperitoneal bladder wall laceration 2 cm or intraperitoneal 2 cm

Grade 3: extraperitoneal>2 cm or intraperitoneal 2 cm

Grade 4: intraperitoneal bladder wall laceration >2 cm

Grade 5: intra- or extraperitoneal bladder wall laceration involving the trigone or bladder neck.

In suspected cases of bladder injuries cystogram X-ray of the bladder after injection of contrast medium is performed

For extraperitoneal injuries (grade 2) without complicating factors, treatment is a insertion of Foley catheter for 7 - 14 days. grade 3 to grade 5 injuries generally require operative repair. Closed suction drains should be left in place after repairs. Suprapubic tube placement is not necessary in most cases. For injuries to the ventral bladder, dome, or posterior bladder, the mucosa is closed in a running fashion using 3-0 vicryl followed by a seromuscular running suture of 2-0 vicryl. The bladder is irrigated to ensure a watertight closure. A third layer in a Lembert fashion can be used in cases at high risk for fistula formation or when a leak is identified. In the laparoscopic setting, a one-layer closure is performed using 2-0 vicryl to close all layers of the bladder. An additional layer can then be added using a 2- 0 vicryl in a Lembert fashion for more extensive injuries

Present data was inserted in the Microsoft Excel worksheet and was analysed for percentage, grading of injury, repair of bladder and complications .

**RESULTS**

In our study 986 patients were operated for LSCS of which 14 had bladder injuries.

**Table 1: Showing injury of patients during cesarean**

| Injury | Bladder Injury | No bladder injury | Total |
|---|---|---|---|
| Cesarean section | 14(1.4%) | 972(98.6%) | 986 |

Among all patients who underwent cesarean section 1.4% suffered from bladder injury.

**Table 2: Showing Gravida Type**

| Gravida type | Count |
|---|---|
| Primi | 3 |
| Multigravida | 11 |
| Total | 14 |

Among all patients who suffered from bladder injury, 3 cases were primigravida and 11 were multigravida type.

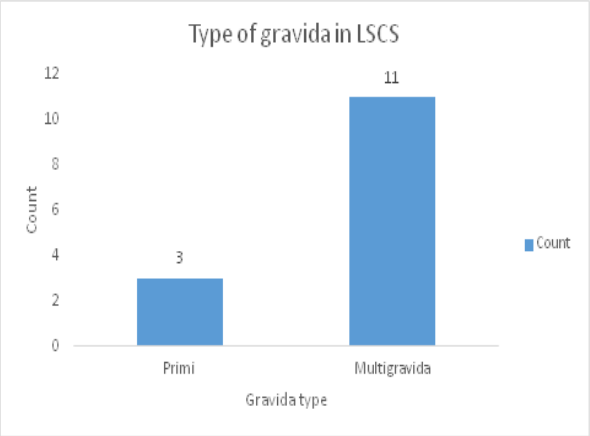


**Figure 1: Type of gravida in LSCS**

**Table 3: Shows repairs**

| Repairs | Count |
|---|---|
| Vicryl 2.0 without SPC | 10 |
| Vicryl 2.0 with SPC | 4 |
| Total | 14 |

Out of 14injuries, 10 injuries were repaired in 2 layers by vicryl 2.0 without insertion of SPC (suprapubic cystectomy) whereas 4 injuries were repaired by primary repair with vicryl 2.0 with insertion of SPC. In post-operative period patients were monitored for vitals, urine output and stitch sites of wounds. No complication were found in 13 patients post operatively and Foleys catheter and SPC catheter were removed after 12 days of operation in those patients. They were discharged after 15 days of operation. 1 complication of surgical site was treated with antibiotics and discharged after 26 days.

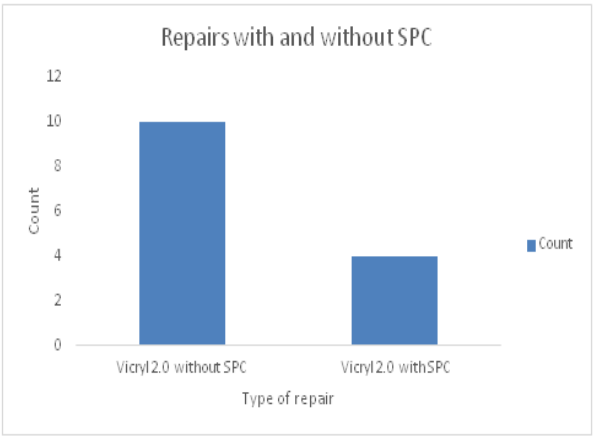


**Figure 2: Type of repair in injuries with and without SPC**

**DISCUSSION:**

Cesarean delivery (CD) is one of the most common obstetric surgeries. Adhesions are because of abnormal wound healing.[x] A fibrin clot is generally formed by the aggregation of blood cells, platelets and clotting of the blood. If fibrinolysis is suppressed i.e., by tissue ischemia and hypoxia, then fibrin deposits may persist and develop into adhesions. Other factors include residual blood, postoperative infection, inflammation and foreign bodies (e.g., sutures)[xi] . The knowledge and understanding of anatomy is the most important tool for a surgeon.[xii] During pelvic surgery, the urinary tract is predisposed to injury due to close anatomic association of genital and urinary organ[5].

In present study 986 patients were operated for LSCS of which 14(1.4%) had bladder injuries. In all 14 injuries, 11 cases were of multigravida and 3 were primigravida cases.

Out of 14 bladder injuries, 11 were detected intra-operatively during urinary leakage and 3 were detected post operatively. Among 14 injuries of bladder, 10 injuries were repaired without insertion of SPC in 2 layers by vicryl 2.0 whereas 4 injuries were repaired with SPC by primary repair with vicryl 2.0. Less morbidity and better quality of life is provided by intraoperative corrections.[xiii]

**CONCLUSION**

In our study 1.4% of the bladder injuries were observed. Early detection and prompt management of bladder injury can decrease the morbidity and mortality in LSCS cases

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