

## Bladder and ureteric injury in gynaecological surgery with surgical interventions

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### Abstract

**INTRODUCTION:** Urological injury in obstetrics and gynaecology are not uncommon because there is a close anatomical association between reproductive and urological system. 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.

**Aims and objectives** The study was a retrospective analysis of all obstetric and gynaecological surgeries over a period of two years from December 2018 to December 2020, there were 2990 LSCS and 10 postpartum hysterectomies done in the department of Obstetrics and gynaecology, department of MYH, MGM Medical college Indore in the given study period. This study was done in the department of Gynaecology in collaboration with department of surgery. Cases with the documented urological injuries during these procedures were analysed further

**MATERIAL AND METHODS:** The study was a retrospective analysis of all obstetric and gynaecological surgeries over a period of two years from December 2018 to December 2020, there were 2990 LSCS and 10 postpartum hysterectomies done in the department of Obstetrics and gynaecology, department of MYH, MGM Medical college Indore in the given study period. This study was done in the department of Gynaecology in collaboration with department of surgery. In suspected cases of bladder injuries cystogram X-ray of the bladder after injection of contrast medium is performed.

**RESULTS:** In this study mean age of bladder injury is 34.8 years and for ureteric injury 35 years. Parity for bladder injury 2.4 and for ureteric injury 3. Gestational age is similar for both is 37 weeks. Among all patients who underwent caesarean section 1.5% suffered from bladder injury, 0.01% ureteric injury and 0.01% for ureteric and bladder injury. Similarly, in peripartum hysterectomy, 40% suffered from bladder injury and no one have ureteric injury. Total 52 [1.5%] cases have injury. Among all patients who suffered from bladder injury, mostly cases are primigravida cases, which are 57% cases. 13% cases are more than two section patients. Others are previous two section 9%, Placenta previa and placenta accreta 7.6%, Previous history of myomectomy and hysterotomy 3.8% and 1.9% cases from 2nd stage labour and CPD patients. In bladder injury, most of the cases are bladder dome [81.5%], posterior wall [14%], lateral wall [4%] cases and none cases in bladder neck injury. Most bladder injury repaired by triple layers vicryl with SPC insertion [44%], without SPC [38%] and only catheterization only 11% cases. All ureteric injury repaired by DJ stent insertion with repair. SPC removed after 14 days.

**CONCLUSION:** 1.5% of the bladder injuries were observed. Early detection and prompt management of bladder injury can decrease the morbidity and mortality in LSCS cases. The incidence urological injuries during obstetrics and gynaecological procedures are rare but the morbidity associated these are significant. Therefore surgeons should be more cautious and high degree of suspicion can help in early diagnosis and avoid the sequel.

### Introduction

Urological injury in obstetrics and gynaecology are not uncommon because there is a close anatomical association between reproductive and Urological system. This is evidenced by the fact that 75% of iatrogenic urinary tract injuries are due to gynaecologic procedures. [1] The incidence of urological injuries in gynaecologic procedures is 0.2 to 1% of all gynaecologic procedures and pelvic operations. [2] Although the incidence of urological injuries during obstetrics and gynaecology procedures are small in number but the associated morbidity is significant in the form of haemorrhage followed by blood transfusion, longer operative time, more febrile morbidity, longer hospital stays and sometimes may need second surgery. The etiology of

urological injury in obstetrics and gynaecology procedures depend upon type of surgery, presence of adhesion due to previous surgery, altered pelvic anatomy due to endometriosis and severe pelvic inflammatory disease, previous radiation therapy, location and size of cervical or broad ligament fibroids and complication like severe intraoperative bleeding. [3]

Caesarean section is a life saving procedure but when performed without appropriate indications can add risk to both mother and baby. As per WHO report, at population level, Caesarean section rates higher than 10% are not associated with reductions in maternal and new-born mortality rates. [4] In India as per District level household survey 3 (DLHS) Caesarean section rate is 28.1% in private sector and 12% in public sector health care facilities. [5] This survey shows that Caesarean 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 Caesarean section like patient's preferences, social norms, fear of vaginal delivery. [6] 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. [8] In gynaecologic 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. [9] 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. [10] Risk factors for bladder injury during LSCS include previous operations, exposure to radiation, malignancy, chronic infection, and inflammation. Sometimes unrecognized bladder injury usually presents 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. [11]

## Material And Methods

The study was a retrospective analysis of all obstetric and gynaecological surgeries over a period of two years from December 2018 to December 2020, there were 2990 LSCS and 10 postpartum hysterectomies done in the department of Obstetrics and gynaecology, department of MYH, MGM Medical college Indore in the given study period. This study was done in the department of Gynaecology in collaboration with department of surgery.

### Inclusion criteria

-The cases who had undergone various obstetrics procedures [LSCS and hysterectomy] during this period.

### Exclusion criteria

-The minor obstetric and gynaecological procedures where the possibility of urologic injury is almost negligible like medical termination of pregnancy, cervical encirclage and gynaecological procedures like dilatation and curettage, conization and laparoscopic tubal ligation.

Of which 49 were diagnosed with the bladder injuries during. Diagnosis of the injuries to bladder was as follows Staging of the bladder injuries.

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 Xray 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.

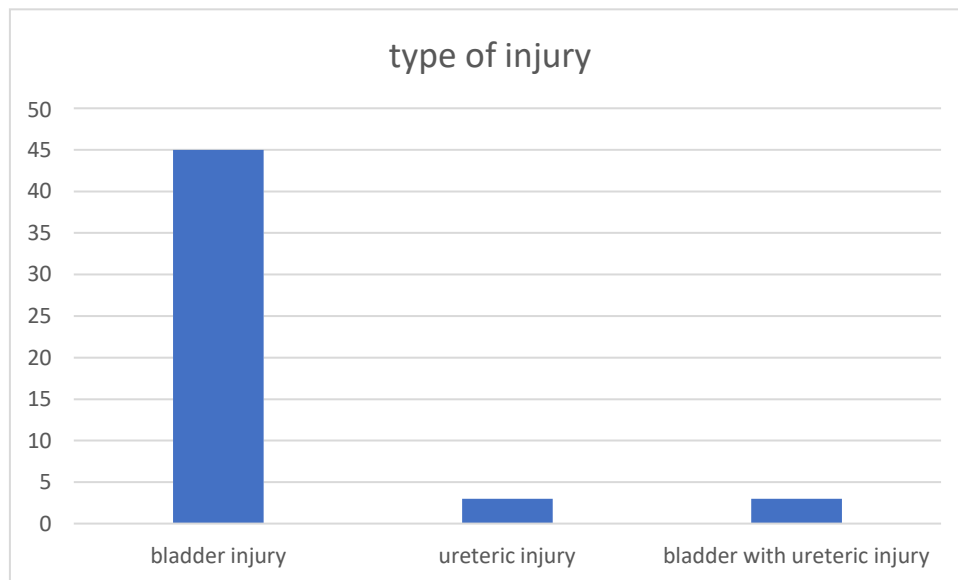
## Results

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

**Table 1: type of injury**

Type of surgery	Bladder injury	Ureteric injury	Ureteric with bladder injury
LSCS	1.5% [45]	0.01% [3]	0.01% [3]
Peripartum hysterectomy	40% [4]	0 [0%]	0 [0%]

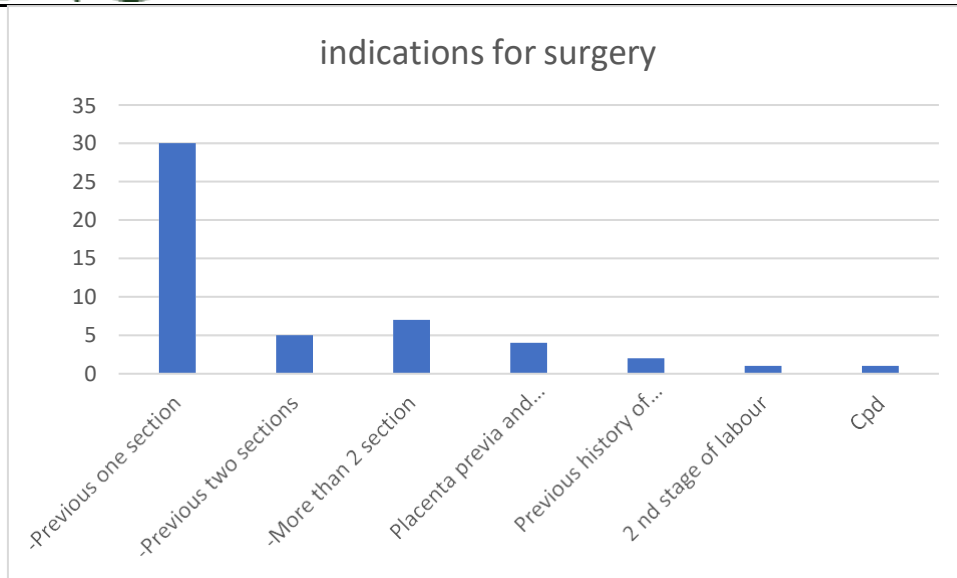
In this study there are 2990 LSCS done and 10 peripartum hysterectomy done. Among all patients who underwent caesarean section 1.5% suffered from bladder injury, 0.01% ureteric injury and 0.01% for ureteric and bladder injury. Similarly, in peripartum hysterectomy, 40% suffered from bladder injury and no one have ureteric injury. Total 52 [1.5%] cases have injury.



**Table 2; indications for surgeries**

Indication	Number	%
Caesarean section		
-Previous one section	30	57
-Previous two sections	5	9
-More than 2 section	7	13
Placenta previa and placenta accreta	4	7.6
Previous history of myomectomy and hysterotomy	2	3.8
2 nd stage of labour	1	1.9
Cpd	1	1.9
Total	52	100

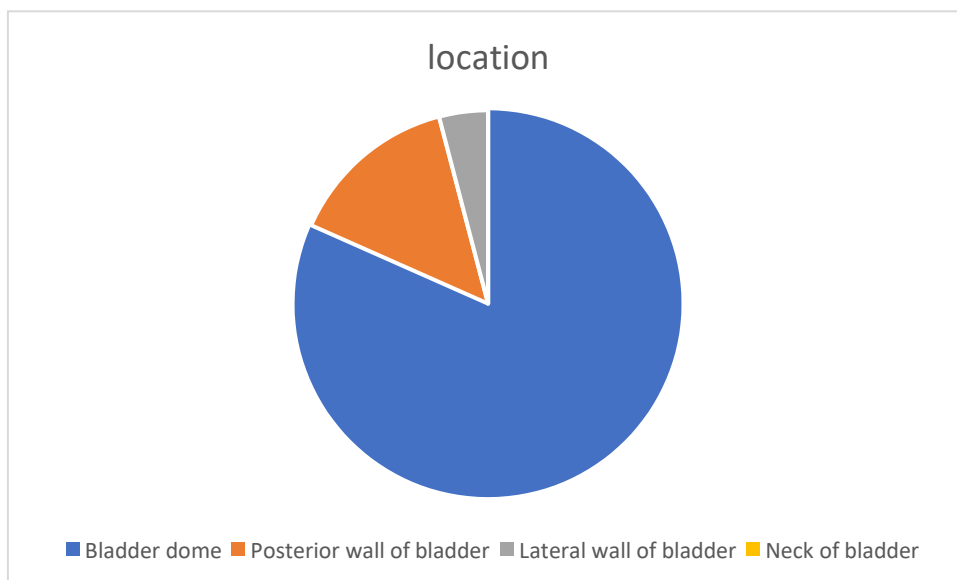
Among all patients who suffered from bladder injury, mostly cases are primigravida cases, which are 57% cases. 13% cases are more than two section patients. Others are previous two section 9%, Placenta previa and placenta accreta 7.6%, Previous history of myomectomy and hysterotomy 3.8% and 1.9% cases from 2<sup>nd</sup> stage labour and CPD patients.



**Table 3; location of injury**

Location	Number	Percentages
Bladder dome	40	81.5
Posterior wall of bladder	7	14
Lateral wall of bladder	2	4
Neck of bladder	0	0

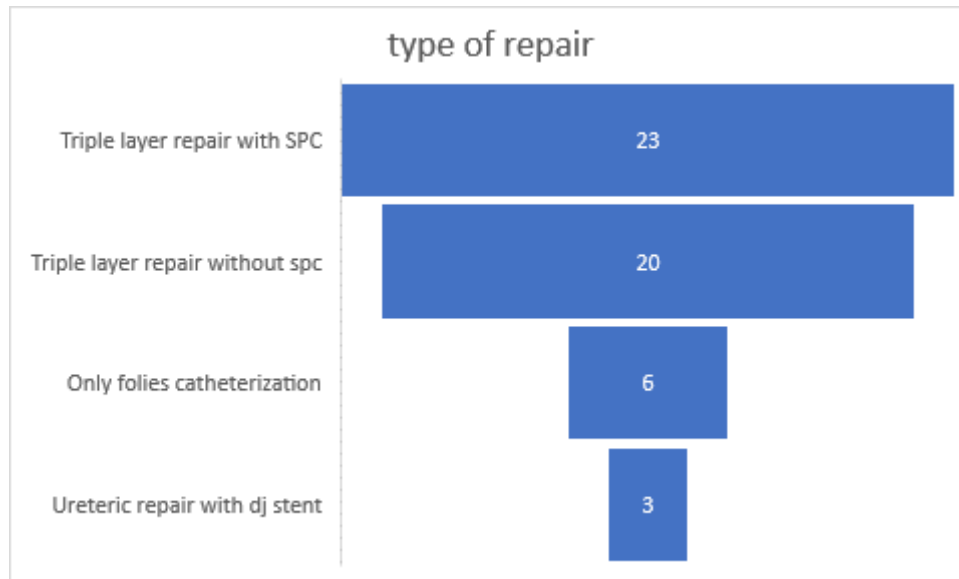
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**Table 4 type of management**

Type	Number	Percentage
Triple layer repair with SPC	23	44
Triple layer repair without spc	20	38
Only folies catheterization	6	11
Ureteric repair with dj stent	3	6

Most bladder injury repaired by triple layers vicryl with SPC insertion [44%], without SPC [38%] and only catheterization only 11% cases. All ureteric injury repaired by DJ stent insertion with repair. SPC removed after 14 days.



**Table no 5 demographic factors**

Factor	Bladder injury	Ureteric injury
Mean Age	34.8 years	35 years
parity	2.4	3
Gestational age	37 weeks	37 weeks
BMI	28.5	29

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## Discussion:

The study was a retrospective analysis of all obstetric and gynaecological surgeries over a period of two years from December 2018 to December 2020, there were 2990 LSCS and 10 postpartum hysterectomies done in the department of Obstetrics and gynaecology, department of MYH, MGM Medical college Indore in the given study period. This study was done in the department of Gynaecology in collaboration with department of surgery. Cases with the documented urological injuries during these procedures were analysed further.

Caesarean delivery (CD) is one of the most common obstetric surgeries. Adhesions are because of abnormal wound healing. 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). The knowledge and understanding of anatomy are the most important tool for a surgeon. During pelvic surgery, the urinary tract is predisposed to injury due to close anatomic association of genital and urinary organ.

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## Conclusion

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