

Urological Injuries in Obstetrical and Gynaecological Surgery at Tertiary Care Hospital

Shazia Naseeb, Piranka Kumari, Shaista Rashid

ABSTRACT

Objectives: To determine the frequency of urological injuries in obstetrical and gynaecological surgery.

Study Design and Setting: The Cross Sectional Study was conducted at Department of Obstetrics & Gynaecology, Jinnah Postgraduate Medical Center, Karachi for duration of 6 months from 31st December 2020 to 30th June 2021.

Methodology: A total of 142 patients selected between the ages of 25 to 55 years of age were included. In this study all patients were included who fulfilled the inclusion criteria undergoing obstetric (cesarean section) & gynecological surgeries (laparatomies & hysterectomies). They were enrolled after taking written and informed consent. Risk factors for urological injuries were assessed in terms of indication (risk for surgery), site of urologic injury, duration of surgery and time interval after surgery. Patients having urological injury from other than obstetric and gynecologic surgeries and those who did not give consent were excluded.

Results: Age range in this study was from 25 to 55 years with mean age of 40.20 ± 6.92 years. Majority of the patients 77 (54.23%) were between 41 to 55 years of age. Mean duration of surgery was 62.16 ± 14.52 minutes. Mean time interval after surgery was 37.51 ± 13.89 hours. In this study, frequency of ureteral injury, urinary bladder injury and mixed injury in obstetrical and gynaecological surgery was found in 01 (0.70%), 19 (13.38%) and 01 (0.70%) patients respectively.

Conclusion: This study concluded that knowledge of pelvic anatomy, careful dissection and patience in difficult cases are the key factors to anticipate and prevent injury.

Keywords: urological injuries in gynaecological surgeries, ureteric injuries, bladder injuries, urological Injuries.

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INTRODUCTION:

Urological injuries in pelvic surgeries are not uncommon and urogenital system grows with each other, sharing common site of development. Urinary bladder and ureter are in close proximity with uterus¹, which makes them vulnerable to injury in pelvic surgeries². In large number of pelvic surgeries performed for gynaecological and obstetrical reasons, bladder and ureter are likely to be injured.³ An estimated 0.3% to 1% of urological injuries occur in gynaecological operations and pelvic surgeries.⁴ Studies reported the prevalence of 16.8% for bladder, 9.6% for ureteric injuries in gynecological

surgery,⁵ and frequency of urological injuries for elective and emergency procedures revealed 0.69%.⁶

Morbidities arising from urological injuries is always frightening for both obstetricians and Gynecologists which leads to longer duration of hospital stay, invasive interventions, repetition of surgery, deterioration of kidney functions and complete loss of kidney potential.^{7,8} Urological injury is serious complication in gynecological operations,⁹ and can occur in uncomplicated gynaecological surgeries too when it is done by unskilled hands.¹⁰

The frequency of urological injuries is dependent on the type of gynaecologic surgery performed, indication of surgery, presence of risk factors like huge cervical and broad ligament fibroids, malignancies especially carcinoma cervix, patients with repeated laparotomies, previous cesarean sections, endometriosis, and distorted anatomy, previous radiation, morbidly adherent placenta, profuse hemorrhage and more in radical hysterectomies.¹¹

Gynaecological operations have been revealed to be accountable for 75% of the ureteric injuries. Bladder injuries are twice or thrice times more commonly reported injury than in ureter.¹²

Incontinence of urine resulting from uro-genital fistula is a

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devastating complication which is not only stressful for surgeons but traumatic for patients. Anuria after surgery is an immediate attention seeking problem, quick diagnosis and early intervention can prevent major complications. Failure of primary repair of urological injuries is not only stressful for surgeons but frightening for patients as leaking urine makes them socially limited.¹³ Urological injuries in pelvic surgery are categorized into early and late morbidities like bladder and ureteric laceration which can be recognized during the time of operation, and late problems appear in the form of vesicovaginal fistula, ureterovaginal fistula, and ureter stricture, which presents after some period of surgery.¹⁴

By Good obstetrical care, urological injuries can be prevented in obstetric patients but this is unavoidable in difficult gynaecological surgeries. Our main purpose of the study is to identify the burden of bladder and ureteric injuries in the patients undergoing surgical procedures for obstetrical and gynaecological reasons in our department of Obstetrics and Gynaecology so strategies could be made to prevent urological complications.

METHODOLOGY:

This study was conducted in Jinnah Postgraduate Medical Centre, Karachi in dept. of OBGYN from the period of 31st December 2020 to 30th June 2021 after approval from the ethical review committee (ERC)of the institute (JPMC) with letter no. F.2-81/2021-GENL/ 57186 /JPMC. This is a cross sectional study. In this study all patients were included who fulfilled inclusion criteria of undergoing obstetric (cesarean section) & gynaecologic surgeries (laprotomies & hysterectomies). They were enrolled after taking written informed consent. Patients excluded from the study were those who developed urological complication and those who did not give consent.

Patient’s data was assembled and scrutinized through statistical package for Social Sciences (SPSS) Version 21. Frequency and percentage were calculated for qualitative variables like type of surgery, site of injury, bladder injury and ureter injury. Mean±SD were calculated for quantitative variable i.e. age, duration of surgery and duration of injury. Stratification was done on age, duration of surgery, time interval after surgery, type of surgery and to observe the effect of these modifiers on outcome

using Chi-square test. P value =0.05 was considered as significant.

RESULTS:

Patients were included in this study within the age range of 25-55 years, mean age of patients’ was 40.20 ± 6.92 years. Most of the patients that is 77 (54.23%) had average age between 41 to 55 years. Mean duration of surgery was 62.16 ± 14.52 minutes. Mean time interval after surgery was 37.51 ± 13.89 hours. Distribution of patients according to indication

Table 1: Stratification of the urological injuries with respect to age

		25-40yrs (n=65)	41-55yrs (n=77)	P-value
Ureteral injury	Yes	00 (0.0%)	01 (1.29%)	0.357
	No	65 (100%)	76 (98.71%)	
Urinary bladder injury	Yes	13 (20.00%)	06 (7.79%)	0.033
	No	52 (80.0%)	71 (92.21%)	
Mixed injury	Yes	01 (1.54%)	00 (0.0%)	0.275
	No	64 (98.46%)	77 (100.0%)	

Table 2: Stratification of the urological injuries with respect to duration of surgery.

		≤60 min (n=62)	>60 min (n=80)	P-value
Ureteral injury	Yes	00 (0.0%)	01 (1.25%)	0.377
	No	62 (100.0%)	79 (98.75%)	
Urinary bladder injury	Yes	07 (11.29%)	12 (15.0%)	0.519
	No	55 (88.71%)	68 (85.0%)	
Mixed injury	Yes	00 (0.0%)	01 (1.25%)	0.377
	No	62 (100.0%)	79 (98.75%)	

Table 3: Stratification of the urological injuries with respect to time interval after surgery

		≤48hrs (n=110)	>48hrs (n=32)	P-value
Ureteral injury	Yes	00 (0.0%)	01 (3.13%)	0.362
	No	110 (100%)	31 (96.87%)	
Urinary bladder injury	Yes	15 (13.64%)	04 (12.50%)	0.002
	No	95 (86.36%)	28 (87.50%)	
Mixed injury	Yes	01 (0.91%)	00 (0.0%)	0.672
	No	109 (99.09%)	32 (100.0%)	

Table 4: Stratification of the urological injuries with respect to type of surgery

		Malignancy (n=34)	Previous surgery (n=56)	Adhesion s (n=27)	Endometriosis/Fibroid (n=25)	P-value
Ureteral injury	Yes	01 (2.94%)	00 (0.0%)	00(0.0%)	00 (0.0%)	0.362
	No	33 (97.06%)	56(100%)	27 (100%)	25(100%)	
Urinary bladder injury	Yes	00 (0.0%)	15 (26.78%)	02(7.4%)	02(8.0%)	0.002
	No	34 (100%)	41 (73.22%)	25 (92.60%)	23 (92%)	
Mixed injury	Yes	00 (0.0%)	01 (1.8%)	00 (0.0%)	00 (0.0%)	0.672
	No	34(100%)	55(98.2%)	27 (100.0%)	25 (100.0%)	

of surgery is shown in Table 1 and 2. In this study, frequency of ureteral injury, urinary bladder injury and mixed injury in obstetrical and gynaecological surgery was found in 01 (0.70%), 19 (13.38%) and 01 (0.70%) patients respectively.

Stratification of the urological injuries with respect to age and duration of surgery is shown in Table, I & II. Stratification of the urological injuries with respect to time interval after surgery and indication of surgery is shown in Table 3 & 4.

DISCUSSION:

Uro-genital system develops with each other and in close relationship so urological complications can be expected in gynecological surgeries. It is reported from a local study that highest number of urological injuries occur in procedures of total abdominal hysterectomy followed by cesarean.¹⁶ Apart from them only few urological complications can result in longer duration of surgery, increase blood loss, prolong hospital stay and may require repeat surgery.

There are many reasons for urological injuries in gynaecological and obstetric surgeries like large fibroid, malignancy, PID, endometriosis, type of surgeries, altered anatomy history of previous surgery, expertise of surgeons and presence of profuse haemorrhage.¹⁷ In the start of advent of laparoscopic surgeries, urological injuries were quite common but with greater advancements in techniques, frequency of urological injuries has decreased yet even now number of ureteric injuries is quite high.¹⁸

With increased awareness and refinement in surgery, prevalence of urological injuries has markedly reduced as they are recognized per-operatively to be managed well in time before the surgery is completed. Thus, by keeping record of these iatrogenic injuries, risk factors can be easily identified so as to develop preventive strategies and manage long-term complications effectively.

We have conducted this study to find out the prevalence of bladder and ureter injuries in pelvic surgeries done for gynaecological and obstetrical reasons.

In this study, frequency of ureteral injury, urinary bladder injury and mixed injury in obstetrical and gynaecological surgery was found in 01 (0.70%), 19 (13.38%) and 01 (0.70%) patients. A retrospective study by Desai RS reported that bladder injury was consistent and it includes bladder laceration and vesico-vaginal fistula. 71.1% had bladder injury and 23.7% had ureteral injury.¹⁴ Rashmi D and Sunil K quoted prevalence of bladder injury and ureteric injuries to be 0.48% and 0.08% respectively.¹⁸

We have 13(9.15%) obstetric cases with bladder injury out of which 11(7.7%) cases with morbidly adherent placenta and 2(1.40%) patients were with previous 3 and 4 cesarean sections without MAP; and it was observed that 1 was mixed (0.7%) injury of MAP in severe haemorrhage.

Aanwar et al reported higher incidence of urological injuries (21.7%) compared to our study. They found bladder injuries

in 11.7% and ureteric injuries in 4.7% of cases of MAP19. Frequency of bladder injury during obstetrical procedure like caesarean section is repeated as 1% and ureteric injury 0.09%.²⁰

Studies of Vandana et al²¹ in 2013, Lee et al²² in 2012, and Choosom et al²³ in 2020 reported prevalence of iatrogenic urologic injuries as 0.42%, 0.19% and 0.042% subsequently which is quite low in comparison to our study at Jinnah Postgraduate Medical Centre. This being a tertiary care hospital receives many referrals of complicated cases like morbidly adherent placenta.²⁴

Bladder was the commonly injured organ in our study and injury was mostly recognized at time of surgery with highest cases of morbidly adherent placentas on previous scars. Fibroid uterus and pelvic adhesion were most recurrent indication of pelvic surgeries.

Obstetrical hysterectomy was the commonest procedure with urological injuries followed by total abdominal hysterectomy. Ureter was damaged in one case of Werthiem hysterectomy while one was noted in case of percreta during cesarean hysterectomy in combination with bladder as mixed injury during profuse hemorrhage. Both of them were clamped closely with uterine arteries and were identified postoperatively.

Urological injury can be reduced by recognizing ureteric pathway by knowing common sites of injury in case of profound haemorrhage by avoiding blind clamping and careful dissection during mobilization with minimal use of diathermy. Bladder injury is the most evident injury in our study during surgery, while diagnosis of ureteric injury was made postoperatively as in other studies²⁶ especially if pelvic surgery is done for malignancy of cervix carcinoma, huge pelvic mass, in case of profuse haemorrhage and in patients with repeated surgeries. Ureter integrity can be checked by injecting frusemide and watch for urinary leakage which gets dilated in cases of obstruction if they are ligated with sutures. Preoperative stenting of ureter helps in identification of ureteric injury. Early recognition of urological injury is necessary to manage them properly at time of surgeries with short term morbidity.²⁷ Whenever patient develops flank pain, fever, hematuria and reduced urine output postoperatively, a strong suspicion must be raised for ureteric injury.²⁸ Cystoscopy can be considered while other investigations like intravenous pyelography and contrast enhance tomography is ultimately needed for diagnosis and prevention of long-term complications.²⁹

Care must be taken while repairing of ureter as it should be stress free. Careful dissection with preservation of blood supply should be done considering proper application of delicate sutures, and attachment of peritoneum and omentum with the repaired ureter, placement of drain to prevent urine collection and putting stent with ureteric catheterization and proximal diversion.³⁰

CONCLUSION:

This study concluded that frequency of urinary bladder injury, ureteral injury and mixed injury in obstetrical and gynaecological surgery was found in 13.38%, 0.70% and 0.70% patients. So, we recommend that a proper protocol should be designed in the high risk patients. Complete grasp on ureteric course, its anatomical relations, anticipation of risk factors of urological injuries and pre-operative stenting in difficult gynecological procedures, keeping radiologist on board and meticulous dissection especially in cases of morbidly adherent placenta are the key elements for prevention of urological injuries.

Authors Contribution:

Shazia Naseeb: Concept Design, Data analysis, Manuscript writing.
Piranka Kumari: Data Interpretation, Data collection
Shaista Rashid: Data analysis

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