

FREQUENCY AND TYPES OF UROLOGICAL INJURIES IN GYNECOLOGY AND OBSTETRIC PRACTICE IN A TEACHING HOSPITAL

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ABSTRACT

Objective: To determine the frequency and types of iatrogenic urological tract injuries during obstetric and gynecological surgical procedures in a tertiary teaching hospital over a period of two years.

Material and Methods: The study was conducted at the Obstetrics and Gynecology unit of Khyber Teaching Hospital Peshawar from January 2017 to December 2018. Any patient undergoing a surgical procedure irrespective of the nature and time of surgery was included. The nature and type of the primary surgical procedure, anatomical site of injury, time of diagnosis, management and therapeutic success rate was determined. Injury was defined as entry into the urinary tract lumen, crushing, ligation or/and excision of the urinary tract, leakage of urine, post-operative hydronephrosis, or extravasation of contrast outside the urinary tract with or without renal damage that required surgical intervention.

Results: The frequency of iatrogenic injury to the urological tract in obstetrics emergency and elective procedures was 0.036% with urinary bladder the most frequently damaged viscera. No ureteric injury was recorded in obstetrical patients. In gynecological procedure only 0.45% injuries were recorded. All of the injuries were diagnosed and dealt with, during the same surgical session, with no patient requiring reoperation. Outcome of the management was satisfactory with no permanent urological tract damage and mortality.

Conclusion: Good knowledge of pelvic anatomy, meticulous care during technically difficult surgical procedures, involvement of urological surgeon in suspicious cases helped us to identify and treat urinary tract damage at the time of primary injury, with good outcome and minimal morbidity.

Key words: Gynecological and obstetric surgery, Urological tract injury.

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INTRODUCTION

Urinary and genital tracts of human beings are closely related to each other in both embryological and adult life¹. This proximity increases the likelihood of urological injuries in pelvic surgeries². There are certain risk factors which further increase this risk. These factors include previous surgery, pelvic infection, endometriosis, big fibroids and ovarian cysts distorting the pelvic anatomy and advanced malignancies³. However thorough knowledge of pelvic anatomy, fine surgical skills, meticulous techniques and keeping high index of suspicion could translate into lower risk of urological injuries and

good peri-operative outcome⁴. Although risk of mortality is very low but morbidity is very high including prolonged operating time, risk of re-operation, loss of renal functions and poor quality of patient's life⁵.

Appropriate preoperative evaluation to outline the course of ureters is required in technically difficult cases. These investigations include ultrasonography, IVP and ureteric catheterization. Intraoperative measures during abdominal hysterectomy are; appropriate operative approach giving maximum exposure, full examination of the disease in the pelvis and identification of pelvic landmark, adequate mobilization of the bladder in a downward and outward direction, operating close to the pathology, avoiding blind clamping of blood vessels. In complicated cases ureters should be identified in its course before dissection either by exposing their pathway and following them or by ureteric catheterization. When direct visualization is not possible, cystoscopy may be done⁶.

Measures during vaginal hysterectomy are the ad-

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equate development of vesico-vaginal space, pushing the bladder out of the field, taking small bites of Para-cervical and parametrial tissue, avoiding double clamping of uterosacral ligaments and doing vaginal oophorectomy cautiously⁷.

Urological tract injuries in obstetrics and gynecology are divided into 2 main types. Acute injury (laceration, ligation, partial and complete transection) is usually diagnosed intra-operatively. Chronic injury (VVF, uretero-vaginal fistula, ureter stricture) which is identified at a later stage. Very few patients present very late with hydronephrosis and non-functioning kidneys⁸. The incidence of urological tract injuries is variable, being very low in low risk patients and very high in complex surgeries as it also depends on type of surgery. Laparoscopic surgeries are associated with high risk of urological injuries than laparotomy. However, in expert hands the risk of bladder injury is now reduced in laparoscopy but that of ureteric injury is still high⁹.

Medicolegal implications are not uncommon in surgery and allied. Therefore, early detection, repair and pre and post-surgery counseling should be done before performing complex surgeries¹⁰. Detection during surgery and immediate repair on table results in less morbidity and early recovery. It is wisely stated by Higgins who said, "The venial sin is injury to ureter but the moral sin is the failure of recognition"¹¹.

Injury to the surrounding structures during surgery is a common complication of all major surgeries. The aim of our study is to find out the frequency of urological tract injuries during gynecological and obstetrics procedures. Regular analysis of the complications occurring during and after operations is very important for clinical audit and for academic purposes. Clinical audit is about measuring the quality of care we provide against relevant standards. This study will not only do the audit of the complications of surgeries but will also help us to identify the factors causing these surgeries. This will further help us to set the priorities for improvement in clinical care.

MATERIAL AND METHODS

This was retrospective chart review carried out in Obstetrics and Gynaecology unit, Khyber Teaching Hospi-

tal from 1st January 2017 to 31st December 2018. Approval from ethical committee was obtained before the study. All patients undergoing major obstetrical, (caesarean section, forceps delivery) and gynecological procedures (total abdominal hysterectomy, vaginal hysterectomy, anterior colporrhaphy and posterior colpoperiniorrhaphy and laprotomy) in the above mentioned specified time period were included in the study. Patients undergoing minor procedures like EUA, D&C and debridement of wound were excluded from the study. The injury was defined as entry into the urinary tract lumen, crushing, ligation or/and excision of the urinary tract, leakage of urine, post-operative hydronephrosis or extravasation of contrast outside the urinary tract with or without renal damage. Retrospective analysis of case record of patients included in the study was carried out. Patients who have sustained injuries were identified. Data was collected on preformed proforma. Frequencies and percentages were calculated for nature of urological injury, time of diagnosis, methods of repair and outcome.

RESULTS

Total number of admissions in the study period were 22698. Age of the patients ranged from 25–60 years. Total number of gynecological procedures were 1097. Total number of obstetric procedures were 13847 of which 10 patients sustained urological tract injuries during study period. Injury to the urinary bladder, ureter and urethra were 0.27%, 0% and 0.18% respectively in gynecological surgeries. The incidence is much lower in obstetric procedures being 0.02%, 0% and 0.014% respectively. Fortunately, all of these injuries were identified on the operation table and primary repair was done. Bladder injuries were more than urethral injuries. They were repaired on the table with vicryl 2/0 in two layers. Bladder was drained for 3 weeks. Three ways silastic catheter was inserted and continuous bladder wash was done till hematuria was stopped. Patients with primary repair were observed on daily basis till the time they got discharged. Apart from the routine examination, leakage of urine from wound, flank distension, unexplained fever, prolonged ileus and signs of sepsis were noted in cases with primary repair. No ureteric injuries were observed. Only four urethral injuries were noted, 2 each in the gynecological and the obstetrical cases. They were repaired intra-operatively and fortunately, no side effects were noted. All repairs were performed successful.

Table 1: Total number of urinary tract injuries

		Bladder Injuries	Ureter Injuries	Urethral Injuries	
Total obstetric Surgeries	13847	3	0	2	5(3036%)
Total Gynecological surgeries	1097	3	0	2	5(0.45%)

Table 2: Frequency of urinary tract injuries in different obstetric and gynecological cases

Name of procedure	Number of procedures	Anatomical site of injury			Time of diagnosis	%
		Urinary Bladder	ureter	urethra		
Total abdominal hysterectomy	576	2	0	0	Primary surgery	0.347
Obstetric hysterectomies	44	1	0	0	Primary surgery	2.25
Vaginal hysterectomy	101	0	0	1	Primary surgery	0.9
Anterio-posterior colporrhaphy	155	0	0	1	Primary surgery	0.6
Laparotomy	221	1	0	0	Primary surgery	0.45
Caesarean section	3218	2	0	0	Primary surgery	0.06
Forceps delivery	295	0	0	1	Primary surgery	0.33
Vaginal delivery	10334	0	0	1	-	0.009

DISCUSSION

Khyber Teaching Hospital is one of the three tertiary teaching hospital of Peshawar, KPK. It is a referral center for treatment of difficult cases from all over KPK and neighbouring Afghanistan. The hospital has an open admission policy which results in admission of patients who are hemodynamically unstable, technically difficult cases, advanced malignancies and postoperative complication. It is also a teaching and training center for undergraduate and post graduate, so we did not encounter any difficulty in sample collection for the above-mentioned study.

The incidence of bladder injury and urethral injury in gynecological surgery was 0.27% and 0.18% respectively in our study, whereas, there incidence in obstetrics procedures was 0.02% and 0.014% respectively. There was no ureteric injury in our study. This incidence is less than the reported incidence of 0.5–1.5% in literature^{12,13}. Rashmi D and Sunil K quoted incidence of bladder injury and ureteric injuries to be 0.48% and 0.08% respectively⁸. Raut V reported higher incidence of bladder and ureteric injuries compared to our study. They found bladder and ureteric injuries in gynecological surgeries to be 1.23% and 0.11% respectively and in obstetric procedures they found it to be 0.67% and 0.33% respectively¹¹.

Most frequent injury in our study was bladder injury. Two bladder injuries were noted in 576 cases of TAH (0.347%). The reason was densely adherent bladder due to previous surgeries. Single bladder injury occurred in 221 cases of laparotomy (0.45%) where laparotomy was performed for tubo-ovarian mass with dense pelvic adhesions. This is low as compared to the incidence noted by Carley ME (0.58%) whereas results by Gilmour D are comparable to our study (0.26%)¹². Thorough pre-operative assessment of patients, improved surgical techniques and thorough knowledge of urinary tract has resulted in decrease in incidence of urological injuries¹³.

In obstetrics 1 bladder injury occurred in 44 obstetrics hysterectomies, making incidence of 2.25%. It favorably compares with results of other studies which showed bladder injury incidence to be 6.1%¹⁴. Indications for ob-

stetrics hysterectomies in our study were rupture uterus, mishandled cases referred from periphery and PPH not responding to medicines and conservative surgical procedures. All these conditions are associated with distorted pelvic anatomy and intractable hemorrhage which make bladder more prone to injury. Only two bladder injuries were noticed in caesarean sections (0.06%). One of the injury was due to dense adhesions from previous 3 caesarean sections and while other injury was noticed in second stage caesarean section¹⁵.

Not a single case of ureteric injury was noticed in our study. Ureteric injuries are commonly seen in difficult cases where pelvic anatomy is distorted. Such cases were thoroughly assessed before the surgery. Detailed diagnostic imaging was done before performing surgery and these cases were done first on list by senior most consultant. This could be the reason of no ureteric injury in our study. Moreover, ureteric injuries more commonly reported in literature occurred during laparoscopic surgeries¹⁶ but laparoscopic surgeries were not done during our study period.

Four urethral injuries were noticed in our study, 2(0.01%) in obstetrics and 2(0.18%) in Gynecology. In obstetrics 1(0.33%) injury was seen in forceps delivery and 1(0.99%) in normal vaginal delivery. In gynecology, 1 (0.9%) urethral injury occurred during vaginal hysterectomy and 1(0.6%) occurred in anterior colporrhaphy and posterior colpoperineorrhaphy. Forceps delivery is associated with high risk of genital tract injury. The incidence 1 in 295 (0.33%) is quite low. This may be due to improved surgical skills and better operative protocols. Another reason could be the increase in caesarean section rate in favor of instrumental vaginal delivery for safe obstetrics¹⁷. Urethral injuries in gynecological surgeries (0.18%) were due to scarred vagina from previous vaginal surgeries. It favorably compares with the results shown by Sahito RA¹⁴.

The detailed retrospective analysis of the patient's record revealed that large abdominal masses, dense adhesions, history of previous surgeries, rupture uterus and massive intraperitoneal bleeding increased the risk of uro-

logical tract injuries. Similar predisposing factors are also reported by Daly JW and Rajasekar D^{18,19}.

A single center retrospective study is the main limitation of this study. Due to increase in the rate of caesarean section and increase in the use of minimally invasive surgery, the risk of urological tract injuries is also increased. Every unit should have their SOPs for management of such cases. Post graduate trainees should be properly trained and supervised in this respect.

CONCLUSIONS

Iatrogenic urological tract injuries, though less life threatening, but carry considerable morbidity. Injuries not detected in time will present with incontinence and fistulae which not only cause morbidity but will also badly affect the quality of patient's life. These injuries can be prevented by having meticulous anatomical knowledge and maintaining a high index of suspicion in complex surgeries.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Gillani S: Main Concept.

Akhtar Z: Data Collection & Drafting.

Ahmed S: Statistical analysis.

Bangash AG: Data Collection & Literature review.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.