



Original Article

Urological Injuries Following Obstetric and Gynecological Surgeries

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Abstract

Obstetric and gynecological surgeries are not uncommon cause of iatrogenic injury to the urinary tract. In this study, we retrospectively report our experiences with these injuries over the last 8 years. Between January-2000 and December-2008, 80 female with age range of 21 to 65 years, presented to us with various urological injuries following obstetric or gynecological surgeries. The types of injury were as follows: vesico-vaginal fistula (56), uretero-vaginal fistula (14), unilateral ureteral ligation (5), bilateral ureteral ligation (2), ureteral trans-section (2), and vesico-uterine fistula (1). In this series, all patients of urological injuries due to obstetric or gynecological surgery were cured of their complications and were free of any complain related to the procedures, except 3 cases of VVF who experienced a failed initial repair. They were managed successfully by 2nd surgery. Injury may occur during obstetric and gynecological surgeries to the urinary tract. This iatrogenic injury imposes a great impact on physical and mental conditions of the patient and her family. Therefore, it is mandatory for the gynecologists and obstetricians to pay careful attention to the anatomy of the urinary tract in order to avoid such iatrogenic injuries.

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Introduction

Injuries to the urinary bladder and ureter are not uncommon complication after obstetric or gynecological surgeries^{1,2,4}. The estimated incidence of such injuries range from 0.4 to 2.5% for non-malignant conditions^{1,2,3}. The development of urogenital fistula and urinary leakage from the vagina after surgery is a source of misery for the patient, anxiety and a sense of failure for the surgeon. Similarly, development of anuria immediately after surgery is a situation which demands emergency attention to the patient. Early diagnosis and the timely proper management of

these injuries greatly affect the outcome and fate of the patient. Failed primary repair of such injuries represents a burden for the surgeon and for the patient, who suffers from the distress and social limitation imposed by urine leakage. Herein, we retrospectively report the experiences with these iatrogenic injuries over a period of about 8 years.

Materials and Methods

Between January-2000 and December-2008, 80 female, with an age range of 21 to 65 years (mean 32.45±12.4 years) were referred to us with

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different types of trauma to the urinary bladder or ureter(s) following obstetric or gynecological surgery. These patients were managed in the department of Gynecology and Obstetric, Rajshahi Medical College and two other governments

approved private nursing home in Rajshahi Metropolitan area.

Presentation

Table-I shows the types of urinary tract injuries and their relation to the offending surgery.

Table-I: Type of urinary tract injury with their offending surgeries. The values shown represent the number of patients.

Type of injury	Offending surgery (n=80)			Total (%)
	Abdominal Hysterectomy	Caesarean section	Vaginal Hysterectomy	
Vesico-vaginal fistula	40	15	01	56(70%)
Uretero-vaginal fistula	08	06	00	14(17.5%)
Ureteral ligation				
Unilateral	03	02	00	05(6.25%)
Bilateral	00	02	00	02(2.5%)
Ureteral trans-section	01	00	01	02(2.5%)
Vesico-uterine fistula	00	01	00	01(1.25%)
Total	52	26	02	80(100%)

The patients with vesico-vaginal fistula (VVF) presented with total urinary incontinence. They came to us 7 days to 15 years after the offending surgery. Out of 56 VVF patients, 1 had a history of previous failed attempt of repair. Patients of uretero-vaginal fistula (UVF) were presented, 10 days to 12 years following offending operation, with the history of continuous dribbling of urine in spite of having normal voiding pattern. Out of 14 UVF patients, 2 presented with total incontinence without any normal micturation pattern. Patients with unilateral ureteral ligation presented with loin pain and/or cystic renal mass of the affected side. They were referred to us 3 months to 4 years after the offending surgery. Bilateral ureteral ligation produces anuria, and the patients were referred to us within 24 hours of operation. 1 patient, of ureteral trans-section, was diagnosed and managed on-table.

Diagnostic workup

Careful history taking, through physical, including P/V examination were done, 3 swab and dye test were performed. Ultrasonography of kidneys, ureters and bladder; plain x-ray examination; intravenous urography (IVU) were performed as and when indicated. Urethro-cystoscopy was performed in all cases in order to diagnose, and to see the site, size and number of fistula. Out of 56 VVF cases, 42 had supra-trigonal and 14 had

trigonal or subtrigonal fistula. In 9 patients, fistula was multiple. In cases of uretero-vaginal fistulae and ureteral ligation cases, ureteral cannulation and/or retrograde ureteropyelography were done by ureteric catheter to determine the side and site of ureteral injury.

Management

Vesico-vaginal fistulae were treated with definitive repair in all cases. In our series, we follow the principle of 'late repair' of fistula. We deferred 'repair' surgery until 10 to 12 weeks after offending operation in the cases those presented earlier. 42 cases of supra-trigonal fistulae were repaired abdominally through the previous lower midline incision. Bladder and vaginal walls were dissected and closed separately with a routine omental patch interposition using 2-0 vicryl suture. 14 patients with trigonal or subtrigonal fistulae were repaired through vaginal approach. No patient required permanent urinary diversion.

Out of 14 patients of uretero-vaginal fistula, 8 were left sided, 4 were right, and in 2 cases, these were bilateral. Ultrasonography and cystoscopic ureteral catheterization were done to determine the side of injury and so the fistula. In unilateral cases, lower ureter was exposed by oblique inguinal muscle cutting incision of the affected side and for bilateral situations, lower midline incision were

used. Dissection of lower ureter and ureteroneocystostomy over a D-J stent were done in 11 patients. Two patients managed by psoas hitch and in 1 case boari flap was needed to bridge the gap of ureteral damage. D-J stent placed in all patients. Patients of unilateral ureteral ligation were presented to us 3 months to 4 years after the offending surgery with loin pain. Two of them had renal mass due to hydronephrosis. Ultrasonography and cystoscopic ureteric cannulation confirmed us the side of ligation. Out of 5 unilaterally ureteral ligated patients, 3 were managed by exploration of lower ureter and ureteroneocystostomy with D-J stenting. For 1 patient, boari flap was needed to bridge the gap of ureteral damage. One patient presented with huge hydroureteronephrosis, severe renal cortical thinning and less than 10% of split renal function on renogram. Simple nephrectomy was done for that patient. We faced 2 patients of bilateral ureteral ligation who were presented with anuria and bilateral loin pain and were managed within 30 hours of offending operation. In 1 patient, left side was managed by deligation and D-J stenting through a proximal ureterotomy, and right side by ureteroneocystostomy, as the injury was extensive. In other one, bilateral ureteroneocystostomy with D-J stenting were needed to manage the damage. Stents removed cystoscopically, 2 to 3 months after surgery in all patients.

Two patients of ureteral trans-section, happened on left side, were detected on-table and spatulated end-to-end anastomosis over a D-J stent were done with 5/0 vicryl suture.

Patient of vesico-uterine fistula was managed by careful dissection and closure of bladder and uterus with omental patch interposition.

Follow-up

Patients were followed-up 3 to 6 months following definitive surgical correction of the urological injuries. Follow-up included history-taking, physical examination, ultrasonography, IVU and cystoscopy when indicated.

Results

All patients of vesico-vaginal fistula, repaired abdominally, were dry immediate post-operatively and subsequent follow-up period. 14 patients, with trigonal or more distally placed fistulae were managed trans-vaginally. Out of these 14 patients; fistula recurred in 3 cases, 5 to 7 days following surgery. They were treated by re-operation later on.

Surgery was successful in all cases of uretero-vaginal fistula. They were dry all through, and their post-operative IVU showed normal morphology and function of the upper tract.

All cases of unilateral or bilateral ureteral ligation treated either by deligation or ureteroneocystostomy ran a smooth post-operative course and showed perfect renal function at follow-up IVU.

Patients of ureteral trans-section and vesico-uterine fistula were also passed a smooth course post-operatively.

Discussion

In this series, only the patients of urological injuries due to obstetric or gynecological surgery were included, and genitourinary fistula due to any other cause were excluded.

There is a general agreement that when inadvertent injury to the bladder or ureter is detected during surgery, immediate on-table repair is the optimal treatment^{1,3}. In contrast, when diagnosis is delayed, some prefer an immediate repair while others prefer repair to be delayed^{1,3,6}. The classic procedure is to delay repair for several months, preferably 3-6, and then to attempt a definitive repair^{1,5,6}. This is the policy adopted in our series. This delay gives the damaged tissue a so-called 'maturation factor' permitting edema to subside, fibrosis to delineate, and inflammatory elements to disappear^{1,6}. Though recently, there has been a tendency towards early repair within 4-6 weeks of injury^{3,4,5,6,8}.

About 70% of patients of this group have had vesico-vaginal fistula (VVF). The commonest site of VVF is at the vaginal vault in the posterior bladder wall, as this is the usual site of bladder

injury during abdominal hysterectomy^{1,3}. This is the situation in our series as well. Hysterectomy-induced fistulae are essentially due to a clean surgical wound with no extensive inflammation or tissue loss, which leads to a small fistula^{1,3,6,7}. Definitive repair of VVF in our series was performed at least 12 weeks after the offending surgery. No VVF repair performed through abdominal route failed. This could be explained by the fact that iatrogenic fistula is usually small, high-up in position and abdominal trans-vesical approach provides wider and comfortable exposure for easy and clean dissection and repair of bladder and vaginal wall. Out of 14 VVF repaired trans-vaginally, 3 failed first operations. They were managed subsequently by re-operation. Our results agrees with the others published reports^{1,2}.

Nearly all gynecological procedures have been reported to cause ureteric injury, with an incidence of 0.4—2.5% for non-malignant conditions^{1,2}. The left ureter is more liable to injury as it is much closer to the cervix than the right ureter^{1,3,7}. In our series, as well as others, ureteric injury was more on the left side (8 vs 4) than that of right. For uretero-vaginal fistulae, we performed definitive surgery at least 10 weeks following offending operation and excellent results were obtained in all of our cases. Our result agrees with other published reports^{1,2,4,5,9}.

Patients of unilateral or bilateral ureteral ligation showed an excellent out-come in our series. Unilaterally ligated patients (6.25%) presented to us at least 3 months after trauma. Though, some authors suggest initial percutaneous nephrostomy (PCN) to be done in unilateral cases to alleviate pain and to protect renal function before definitive surgery^{1,4,5}, we performed definitive procedures directly without any prior drainage procedure. Patients of bilateral ureteral ligation (2.5%), presented with anuria and loin pain, were explored immediately. Patients are alright symptomatically and their renal functions are perfect on follow-up investigations.

Vesico-uterine fistula is one of the least common types of urogenital fistulae. It is only 1(1.25%) case in our series. The incidence of such fistula in other series is 1.3 to 1.7%^{1,7,8}. The patient cured of the fistula after repair.

Conclusion

Injury may occur during obstetrical and gynecological surgeries to the urinary tract, especially to the urinary bladder and ureter(s). This iatrogenic injury imposes a great impact on physical and mental conditions of the patient and her family. Patient becomes greatly embarrassed to herself, to her family and to the society. Obviously, these injuries are preventable. Therefore, it is mandatory for the gynecologists and obstetricians to pay careful attention to the anatomy of the urinary tract in order to avoid such iatrogenic injuries. Indwelling catheterization may be successful as first aid management in some cases. Earliest exploration and appropriate measure is necessary in cases of ureteral obstruction / ligation, especially in bilateral injuries. Appropriate surgical repair of these urogenital injuries are successful and rewarding in almost all cases.

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