

**Original article:**

## **Retrospective Analysis of Urological Injuries during Obstetric and Gynecological Procedures**

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**Abstract:**

The female genital and urinary tracts are anatomically closely related; therefore, the potential for injury to one must always be considered when operating on the other. The risk of damage increases when the normal anatomy is altered by primary pathologic factors or when it is insufficiently identified during intraoperative complications, such as severe bleeding or pelvic adhesions. The true incidence is difficult to ascertain from the literature because most studies review only patients who became symptomatic and required urologic intervention. Injuries due to obstetric and gynecologic surgery are normally divided into two categories: acute complications such as bladder laceration or ureter laceration that can be identified immediately during the operation, and chronic complications such as vesicovaginal fistula, ureterovaginal fistula, and ureter stricture, which can occur later on. To avoid injury to the urinary tract, the gynecologist must have an accurate understanding of pelvic anatomy, use a meticulous and methodical surgical technique, and maintain a constant high degree of vigilance.

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### **INTRODUCTION**

The female genital and urinary tracts are anatomically closely related; therefore, the potential for injury to one must always be considered when operating on the other. The risk of damage increases when the normal anatomy is altered by primary pathologic factors or when it is insufficiently identified during intraoperative complications, such as severe bleeding or pelvic adhesions. The true incidence is difficult to ascertain from the literature because most studies review only patients who became symptomatic and required urologic intervention. Injuries due to obstetric and gynecologic surgery are normally divided into two categories: acute complications such as bladder laceration or ureter laceration that can be identified immediately during the operation, and chronic complications such as vesicovaginal fistula, ureterovaginal fistula, and ureter stricture, which can occur later on. To avoid injury to the urinary tract, the gynecologist must have an accurate understanding of pelvic anatomy, use a meticulous and methodical surgical technique, and maintain a constant high degree of vigilance. This study was performed to investigate the clinical features of urologic complications such as iatrogenic ureter, bladder, and kidney injuries following obstetric and gynecologic surgery and to help to prevent future occurrences of urinary tract injury.

### **MATERIALS AND METHODS**

All patients who underwent obstetric and gynecologic surgeries in the pelvic cavity in last three years at our center were analyzed. All patients had a detailed history taken and a clinical examination performed. Through retrospective review, we researched the site of injury, etiologic characteristics of the injury, etiologic disease of obstetric and gynecologic surgery, and therapeutic success rate with

respect to time of diagnosis and treatment of complications. Urological complications were defined as laceration, transection, rupture, or ligation of the genitourinary tract found during surgery or as hydronephrosis and leakage of contrast media out of the urinary tract found after surgery that required interventional or surgical treatment. Success of the first repair was the criterion for successful treatment.

## **RESULTS**

The most common type of urinary tract injury was bladder injury, including bladder laceration and vesicovaginal fistula. Of these patients, 73% had bladder injury 18% had ureteral injury, 2.1% had vesico-vaginal fistula and 1.1% had ureterovaginal fistula. Among cases with ureteral injury, most had lacerations, none had transections. The right and left ureters were injured with similar frequency, and no patients had bilateral injury. Laparoscopic-assisted radical vaginal hysterectomy had the highest rate of injury. The incidence of urinary tract injury in relation to the type of surgery was 3.65% for radical abdominal hysterectomy, 0.61% for laparoscopic-assisted vaginal hysterectomy, 0.43% for vaginal hysterectomy, 0.26% for total abdominal hysterectomy. The gynecological and obstetric diseases requiring surgery that were responsible for ureteral injuries were cervical cancer, uterine myoma, endometrial cancer, and endometriosis. Vesicovaginal fistula resulted from treatment of ovarian cancer and uterine myoma in one patient each. All cases of bladder injury underwent either trans abdominal or transvaginal primary repair during surgery with a 100% success rate.

## **DISCUSSION**

Urinary tract injury is the most common complication of pelvic surgery. Its incidence is reported to be from 0.5 to 1.5%, and bladder injury is more common than ureter injury [1,2]. Most bladder injuries, but only one third of all ureter injuries, are identified during surgery. The bladder is the most common site of urinary tract injury during pelvic surgery. The observed high incidence of bladder injury may be due to the fact that such injuries are easier to detect than injuries occurring at other sites. The incidence of urinary tract injury during obstetric and gynecologic surgery could depend on the experience of the surgeon. Preoperative stent insertion was recommended when patients had a history of previous pelvic surgery or there was a strong suspicion of pelvic adhesion. This makes the identification of the ureter easier and makes it less prone to injury. However, its reported cost-effectiveness was lower than expected [3]. The most common sites of ureteral injury during hysterectomy are along the pelvic wall lateral to the uterine artery, the area of ureterovesical junction, and the base of the broad ligament [4,5]. It has been argued that recognition and repair of injury at the time of urinary tract injury or within a week of the injury allows for better results with fewer complications [3,4,5].

## **CONCLUSIONS**

When a urologic complication develops, early diagnosis and early urologic intervention are necessary to prevent the occurrence of delayed urologic complications. Bladder injury occurred very frequently compared to ureteral injury. The difficulty of diagnosis, variety of injured states, and time to complete cure were much greater among patients with ureteral injury.

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