

# Urological Injuries in Gynaecological Practice - When is the Optimal Time for Repair?

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## ABSTRACT

**Objective:** This is a retrospective study to determine differences in outcome and prognosis between patients with urological injuries treated immediately within 30 days by definitive repair and those in whom definitive treatment was delayed.

**Subjects:** Patients who sustained urinary tract injuries after gynaecological surgery and who were subsequently referred to the Urological Department of (former) Toa Payoh Hospital during the period 1985-1991.

**Results:** There were nine injuries sustained in eight patients: six to the ureters and three to the bladder. One patient had a double injury: a vesico-vaginal fistula and a uretero-vaginal fistula. There were six patients whose injuries were repaired within 30 days of the primary gynaecological operation. They stayed an average of 10-14 days in hospital and were discharged well. They were well both clinically and radiologically on follow-up. Two patients had initial drainage before definitive surgery was undertaken. One patient recovered fully but had to endure the morbidity of a prolonged, 3-month hospital stay. The other patient treated by simple diathermy for her vesico-vaginal fistula, never fully recovered, and subsequently defaulted follow-up.

**Conclusion:** The old dictum of waiting 3 to 6 months to allow oedema to subside, tissue planes to be re-established and the fistula to become smaller, before repair is attempted, should be reviewed. Recently acquired fistulae may be repaired definitively soon after diagnosis of the problem, with good results in competent hands, as supported in this series of patients studied. This shortens the length of hospital stay for the patients and alleviates much of the morbidity endured.

**Keywords:** urological injuries, gynaecological surgery, early repair

## INTRODUCTION

One of the major concerns of the gynaecologist during gynaecological procedures is damage to the urinary tract. Fortunately, this is a rare complication: the incidence being 0.5% - 1% of all pelvic operations<sup>(1)</sup>.

Accidental injury can be a perplexing problem, both to the patient and to the gynaecologist, when it occurs. Difficult convalescence with prolonged

hospital stay and additional surgical treatment increases the post-operative morbidity of the patient.

Much discussion has been made about the diagnosis and surgical repair of these injuries. However, there have been few reports on the differences in outcomes and prognosis between patients with injuries diagnosed and treated immediately by definitive repair and those in whom definitive treatment was delayed with initial drainage being undertaken first. This study looks at the timing of definitive surgery to the urological injuries sustained and describes a better outcome for patients who had their injuries treated early compared to those in whom definitive repair was delayed.

## PATIENTS AND METHODS

A retrospective review of iatrogenic urological injuries due to gynaecological surgery was done for a 6-year period, between 1985 and 1991, in the Urological Department of the former Toa Payoh Hospital, Singapore. This was a specialised urological unit which receives referred cases from various hospitals in Singapore, both from the private and government subsidised hospitals. There were 8 female patients with 9 injuries. Their ages ranged from 44 - 52 years with a mean age of 45 years. The surgeons who performed the definitive repair were all urologists. There were six ureteric injuries and three bladder injuries. The level of specialist performing the gynaecological operations were of different grades ranging from registrars to senior consultants.

## Case 1

This 46-year-old patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy performed for uterine fibroids. She presented three weeks after the primary operation, complaining of abdominal pain and abdominal distension. The histology reported a cut segment from the ureter, in addition to the hysterectomy specimen. An intravenous pyelogram, cystoscopy and retrograde pyelogram were performed, showing transection of a segment of the right ureter at the level of the fifth lumbar vertebrae.

She had a laparotomy four weeks from the primary operation. A definitive re-implantation of

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the proximal ureter into the bladder with the aid of a Boari-Ockerblad flap and a psoas hitch was done. A double-J stent was placed in-situ and removed two months later. She stayed 12 days in hospital after the definitive repair. She was reviewed a month later and was asymptomatic and had a normal intravenous pyelogram. She is well to date.

#### **Case 2**

This 44-year-old patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy for uterine fibroids. She presented 10 days after the primary operation complaining of leaking per vaginum and urinary incontinence. An intravenous pyelogram and cystoscopy were performed showing a mid to high vesico-vaginal fistula.

A decision to manage her conservatively with an indwelling Foley's catheter for bladder drainage was made. This was done for six weeks but the fistula failed to heal. Cystodiathermy of the fistulous tract between the bladder and vagina was then performed cystoscopically. The patient stayed a total of 53 days in hospital. She was reviewed a month later with persistent leaking per vaginum on and off. She subsequently defaulted follow-up.

#### **Case 3**

This 52-year-old patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy performed for uterine fibroids. She presented three weeks post-operation, complaining of soiling of her perineum on and off. An intravenous pyelogram and cystoscopy performed showed a low left uretero-vaginal fistula due to a ligature.

She had a laparotomy four weeks from the primary operation. A definitive re-implantation of the proximal ureter into the bladder with the aid of a Boari-Ockerblad flap was done. A double-J stent was placed in-situ which was removed two months later. She stayed for 14 days in hospital and was discharged well. She was seen one month later and was asymptomatic. An intravenous pyelogram done was normal. She was well a year later.

#### **Case 4**

This 44-year-old patient had a total abdominal hysterectomy performed for uterine fibroids. She presented three weeks later, complaining of leaking per vaginum. An intravenous pyelogram, a cystoscopy and a micturating cystogram done, showed a high vesico-vaginal fistula.

She had definitive surgery done four weeks from the primary operation. A trans-peritoneal approach to repair the fistula with the aid of a mobilised vascularised omental pedicle was done. She stayed for 14 days in hospital. She was seen a month later and was noted to be asymptomatic. She had both normal intravenous pyelogram and micturating cystogram. However, she developed a stitch sinus formation over the abdominal incision which was subsequently excised and repaired.

#### **Case 5**

This 49-year-old patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy performed for cervical fibroids impacted in the lower segment. She presented two weeks later complaining of urinary incontinence. An intravenous pyelogram, a cystoscopy, a retrograde pyelogram and a micturating cystogram were done which showed a right uretero-vaginal fistula caused by a ligature and a concurrent high vesico-vaginal fistula.

She had a trans-peritoneal repair of the fistulae three weeks from the primary operation. The proximal ureter was re-implanted with the aid of a Boari flap and the vesico-vaginal fistula was repaired with the aid of a vascularised omental pedicle flap. She stayed 14 days in hospital and was well on discharge. She was seen a month later and was asymptomatic, had a normal intravenous pyelogram and micturating cystogram and a normal ultrasound of the kidneys. She was well 9 months later.

#### **Case 6**

This 45-year-old patient had a total abdominal hysterectomy performed for uterine fibroids. She presented two weeks later, complaining of urinary incontinence and dysuria. An intravenous pyelogram, a cystoscopy, a retrograde pyelogram and a urinalysis done, showed urinary tract infection and a left uretero-vaginal fistula due to a ligature.

She had a laparotomy four weeks from the hysterectomy, after her urinary tract infection was treated. A definitive re-implantation of the proximal ureter into the bladder was done with the aid of a Boari-Ockerblad flap. She stayed 10 days in hospital and was well on discharge. She was asymptomatic a month later and had a normal intravenous pyelogram. She also had a normal ultrasound of the kidneys. She was well 3 years later.

#### **Case 7**

This 44-year-old patient had a total abdominal hysterectomy performed for uterine fibroids. She complained of abdominal pain and distension on the fourth post-operative day and was found to have urine flowing out of her corrugated drain. An intravenous pyelogram, a cystoscopy and a retrograde pyelogram which were done showed a transection of the lower end of the right ureter.

Primary urinary diversion and drainage of urine was done via a percutaneous nephrostomy and a suprapubic catheter. This was left for three months and changed periodically and finally followed by a definitive re-implantation of the ureter using a Boari flap. The patient stayed in hospital for three months. She was well five years later.

#### **Case 8**

This 48-year-old patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy performed for uterine fibroids. A clamp-release

injury of the lower right ureter was recognised intra-operatively.

Immediate ureteric catheterisation was done and replacement of this by a double-J silicone stent was done three days later. This was left for six weeks to provide drainage of urine. The patient was allowed home on the seventh post-operative day and was asymptomatic. She had a normal intravenous pyelogram after the double-J stent was removed six weeks later. She was well 6 months later.

## RESULTS

Success was measured by absence of symptoms and normal intravenous pyelograms or micturating cystograms on follow-up. The length of hospital stay for the six patients who had early definitive repair ranged from 10 to 14 days. There were no deaths from the series. There was also no renal impairment due to the injuries sustained and only one case of urinary tract infection which was treated.

The five ureteral injuries that were repaired within 30 days of the primary gynaecological operation were all successful. Normal intravenous pyelograms were demonstrated in the follow-up period which ranged from six months to five years. The patients were symptom-free at the last follow-up. The patient who initially had urinary diversion before repair also recovered fully but had the additional inconvenience of a prolonged hospital stay with a percutaneous nephrostomy and a suprapubic catheter for three months before successful repair was done.

The two vesico-vaginal fistulae that were repaired early within 30 days of the injury occurring via the trans-peritoneal route did well. Micturating cystograms and intravenous pyelograms were normal and there were no more symptoms. No stress incontinence was reported. However in the case where initial drainage and subsequent cystodiathermy were performed, the patient failed to heal and complained of persistent leaking per vaginum on and off. This patient defaulted after having been seen only once at follow-up.

## Follow-up/Complications

Follow-up period ranged from six months to 5 years (mean: 2 years). There were no major complication in the patients follow-up. One patient had an abdominal stitch sinus formation which was explored and excised.

## DISCUSSION

The source of the gynaecologist's concern during operation is the retroperitoneal course of the ureters in close continuity with the infundibulopelvic ligament at the pelvic brim and the close relationship of the ureters to the uterine arteries and cervix. The close application of the bladder and urethra to the lower anterior part of the ureters and anterior vagina also predispose these to be damaged during rough handling.

The presentation of urological injuries is usually within the first two weeks of the injury when patients may complain of abdominal pain and distension, wound leak, leaking per vaginum or urinary incontinence. If recognised intra-operatively they should be dealt with immediately. Any case of unexplained fever, loin pain or haematuria occurring post-operatively should alert the gynaecologist to the possibility of damage to the urinary tract. Any suspected case of injury should have intravenous urograms, micturating cystograms or cystoscopy with retrograde pyelograms done to determine the exact site and type of injury. Most often injuries occur unilaterally in either ureter and are distal to the pelvic brim, as occurred in this series of patients. Bladder injuries occur commonly when it is being separated from the uterus during hysterectomy, resulting in vesico-vaginal fistulae which can be high, mid or low.

Having diagnosed the injuries, much controversy exist as to the actual timing of definitive surgery. Repair can be either undertaken immediately ie intra-operatively or within 10 - 70 days of the primary gynaecological operation<sup>(2)</sup> or delayed with initial drainage or urinary diversion first.

Yet some authors advocate a totally conservative approach where a ureteral or urinary catheter is left for as long as possible anticipating spontaneous healing. The patient with a mid to high vesico-vaginal fistula treated conservatively with an indwelling Foley's catheter for six weeks failed to heal and subsequently defaulted after staying 53 days in hospital.

Some surgeons prefer proximal urinary diversion as an initial step and a later repair when tissues appear better healed. The patient with a ureteric injury and who had initial urinary drainage in this series did well but stayed three months in hospital.

Still others would recommend immediate and definitive repair as an early direct intervention of the injury. This was the case for the six other patients who had definitive repair done within 30 days of the urological injury. Their outcomes were successful with a shortened hospital stay of about 10 - 14 days. In recent years, this early aggressive form of management has met with good success rates and shorter hospital stay and morbidity for the patient<sup>(2,3)</sup>.

In conclusion, favourable results have been shown in this small series of early aggressive management of ureteral and bladder injuries. Prevention is the hallmark of gynaecological surgery where urological injuries are concerned but if damage should occur, it is important to recognise it early and have it treated definitively. Early management should be undertaken 10 - 70 days after the initial primary gynaecological operation<sup>(3)</sup> ie from the time when the injury occurred with a bias for earlier intervention when competent urological expertise is readily available. Delay compromises the tissues and thus the repair. This

form of management provides excellent results and shortens the length of hospital stay for the patient. Her early and rapid return to normality helps prevent the much feared litigation which so often follows treatment that is delayed or which caused prolonged suffering before the fault is rectified.

#### ACKNOWLEDGMENT

We would like to thank Ms Connie Cheng for her time spent in typing this manuscript.

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