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## LAPAROSCOPIC REPAIR OF URINARY BLADDER PERFORATED DURING LAPAROSCOPIC SUBTOTAL HYSTERECTOMY: CASE REPORT

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## LAPAROSCOPIC REPAIR OF URINARY BLADDER PERFORATED DURING LAPAROSCOPIC SUBTOTAL HYSTERECTOMY: CASE REPORT

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### SUMMARY

**Bladder injury with subsequent intra-operative laparoscopic repair during a laparoscopic subtotal hysterectomy is reported. The injury was recognised intra-operatively. A successful laparoscopic repair was undertaken using intra-corporeal sutures. The case is highlighted to report potential complications of laparoscopic surgery and their management options. The possible mechanisms of injury, prevention and the principles of management are discussed.**

### INTRODUCTION

The complications of hysterectomies, during the abdominal or vaginal route have been well documented in numerous publications (1-4). More recently with the advent of laparoscopic procedures, several complications of laparoscopic hysterectomies are coming to unfold (5). Querleu *et al* in a French multicentre study reported six bladder injuries amongst 17,521 diagnostic and operative laparoscopies (6). Saravelos *et al* in 1996, reported one case of a delayed presentation of bladder perforation managed conservatively by continuous bladder drainage with a Foley's catheter (7). Gilmour *et al* noted that the frequency of bladder injuries in gynaecological procedures varied from 0.2 to 19.5 per 1000 (8).

The risk factors for potential bladder injury include experience of the surgeon, posterior bladder adhesions, particularly resulting from previous surgery, including Caesarean section (8). In laparoscopic subtotal hysterectomy, dissection of the utero-vesical fold during caudal deflection of the bladder, a high knife bladder injury, especially in the

presence of a cystocoele, failure of obtaining a good cervicovesical dissection plane, an inadvertently placed posterior bladder wall suture may also increase the risk of a injury (9).

In our experience, out of 22 laparoscopic subtotal hysterectomies and 132 cases of total laparoscopic hysterectomies performed at various centres by the principal author, one case of intra-operative bladder injury was encountered (0.64%), and this case is discussed.

In the case presented the bladder was dissected and mobilised off the lower uterine segment successfully and laparoscopic repair was undertaken in view of competent skills in intra-corporal suturing.

### CASE REPORT

The 34 year-old para 2 + 0 was admitted to the Mombasa Hospital in January 2007 with a history of lower abdominal pain and heavy prolonged periods with clots. She gave no history of any intermenstrual or post coital bleeding or dyspareunia.

There was no past medical history of diabetes, hypertension or bronchial asthma. However the patient had had an appendectomy done six years earlier.

Her menstrual cycle was 28–32 days and regular. The flow was heavy and prolonged for seven to eight days. She experienced severe pain during menstruation and bled with clots. The patient has had two Caesarean sections, the last being in 2001. She had used no contraception.

She has been married for 21 years and worked at the Mombasa Hospital. Her husband was a successful businessman.

On examination, the patient was in good general condition, well built, rather obese and well nourished. There was no pallor, cyanosis, icterus or any significant lymphadenopathy. She had no pedal or sacral oedema. The vital signs were normal. She was afebrile and the blood pressure was 120/80 mmHg. The breasts were also normal.

Examination of the cardiovascular, respiratory and central nervous systems did not reveal any abnormalities.

Abdominal examination revealed previous Appendectomy and fannestiel scars. There was no tenderness. The liver and spleen were not palpable. There was no evidence of any intra-abdominal free fluid. The bowel sounds were normal.

On pelvic examination, the external genitalia were normal and the vaginal mucosa appeared healthy. The cervix was firm and regular and appeared normal. The uterus was bulky in size, rather irregular, anteverted and mobile and corresponded to 12 weeks size pregnancy. The right and left adnexae were free of any tenderness or masses. The pouch of Douglas appeared empty. There was a moderate vaginal discharge, which was colourless and odourless.

A pelvic ultrasound reported the presence of a bulky irregular uterus with low diffuse echogenicity involving the body and fundus. It measured 11.2 x 6.6 x 4.8 cm. Both the ovaries were normal. There were no endometrial abnormalities seen. The pouch of Douglas appeared clear. The haemoglobin was 10.7 gms/dl, urea and electrolytes and blood sugar were normal. She was blood group B positive. A Pap Smear done earlier was reported as normal. The thyroid function, renal and liver function tests

were normal. A diagnosis of dysfunctional uterine bleeding was entertained. The patient opted for a laparoscopic subtotal hysterectomy, (LSH) after discussing all her available options.

She was subsequently prepared for a laparoscopic subtotal hysterectomy on the 21st January, 2007. Enema was given in the morning before going to theatre.

Under general anaesthesia a routine pnueomoperitoneum was created through a veress needle. An 11 mm trochar and a 10 mm 30° laparoscope were inserted through the umbilical port. A good view was obtained and moderate pelvic adhesions involving the right cornu of the uterus and the caecum were released by sharp dissection. The uterus appeared rather bulky but regular. Both the fallopian tubes and ovaries appeared normal and healthy. There were no endometriotic lesions seen in the pelvis. However there were dense anterior wall adhesions involving the bladder and the lower uterine segment. The round ligaments, fallopian tubes, ovarian ligaments and broad ligaments were desiccated and resected bilaterally using bipolar forceps, scissors and the harmonic scalpel. The anterior and posterior leaves of the broad ligament were subsequently resected. There were dense bladder adhesions encountered. During the separation of the bladder, a 3–4 cm rent was noted in the dome of the bladder. The posterior wall of the bladder was subsequently gently dissected off the lower uterine segment upto the level of the uterosacral ligaments, posteriorly. The cervix was amputated using the harmonic scalpel, and the uterus was delivered by morcellation.

The bladder tear was repaired laparoscopically in two layers using continuous 2/0 vicry, intracorporeal sutures. Haemostasis was well achieved.

The bladder was catheterised, and a small quantity of clear urine obtained. Good peritoneal lavage gave assurance of having achieved adequate haemostasis. An intra-abdominal drain was left *in situ*. The uterine specimen was sent for histological evaluation, which confirmed myometrial hyperplasia with foci of adenomyosis.

An in-dwelling catheter was retained for ten days and was subsequently removed. The patient was subsequently reviewed at three months and was voiding urine normally without any complaints.

## DISCUSSION

Bladder injury during laparoscopic surgery, although rare, is a dreaded complication. Only a few cases of this unfortunate complication have been reported (10-12). Harkki-Sirne *et al* reported the incidence of urinary tract injuries during gynaecologic laparoscopy to be one to two injuries per 1000 procedures (13). This rate appears to be similar to published rates of urinary tract injuries after laparotomy (14).

In most instances, bladder injuries are recognised and rectified intra-operatively, however, Georgy *et al* reported one case of a delayed diagnosis, which presented with haematuria, 24 hours after surgery (15). In the case presented a bladder injury was recognised intra-operatively.

Daniell *et al* (16) reported a delayed vesico-cervical fistula in a 35 year-old nulliparous female undergoing a laparoscopic supracervical hysterectomy, for pelvic endometriosis. He argued that the fistula may have been attributed to thermal necrosis of the small volume cervix, coupled with sub-clinical cervicitis, leading to breakdown of the bladder floor. The patient presented was a 34-year-old, para 2 + 0, who had undergone previous surgery, and had significant risk factors that made her prone to a bladder injury. Caudal deflection of the bladder during vaginal dissection was rather difficult, in this case, hence the resultant injury.

Injuries of the urinary system have been eluded in several reports. Jones (17) reported an incidence of one vesicovaginal fistula (0.2%), five bladder injuries (1.0%) and two ureteric injuries (0.4%) at the North Adelaide Memorial Medical Centre, South Australia, in a series of 500 laparoscopic hysterectomies, giving a total urinary system injury rate of 1.6% (17).

The case presented was the first such complication encountered by the author in his series of laparoscopic subtotal and total laparoscopic hysterectomies numbering. The patient was obese with two previous Caesarian section scars and the adhesions encountered may have predisposed to the bladder injury.

Munro (18) and Hasson (19) advocated the supra-cervical hysterectomy with adequate ongoing surveillance of the cervix, since the absence of dissection close to the bladder, ureters and cervix minimised the risk of intra-operative urinary tract

injury. Other advantages of retaining the cervix include the reduced incidence of post-operative cuff infection and a reduced chance of subsequent vault prolapse.

In this patient a subtotal hysterectomy was undertaken and the intra-operative recognition of the bladder tear with subsequent laparoscopic repair allowed the patient a successful recovery without prolonged discomfort.

Technically this operation was difficult, with abundant lower uterine segment scarring and adhesions and distortion between the bladder and the anterior vaginal wall. It is of paramount importance to maintain a good rapport and communication between the patient and the surgical team. This is a trying time for the patient and the families and quality time spent to explain and discuss the complication and ongoing management issues of the situation goes a long way in easing the anxiety and stress for all. At the end of the day, the goal is to achieve a satisfactory outcome and recovery.

Nezhat *et al* noted that the management of intra-operative bladder injuries depends on the size and location of the cystotomy, and noted that cystotomies of upto 10mm in diameter resulting from needles or laparoscopic trocars need not be repaired, and can be managed conservatively by simple bladder drainage for five to 14 days post-operatively (20).

Larger bladder injuries can be managed by laparoscopic repair or by laparotomy. Laparoscopic repair of bladder injuries, although somewhat controversial, has been shown in a number of reports to be a viable alternative to the more invasive repairs performed by laparotomy (21,22). Before repair of a bladder injury is undertaken, the surgeon must ensure that the injury does not involve the trigone, because ureteral obstruction may result from misplaced sutures (22). Reich *et al* recommended a two layered closure of the bladder injury (22). Font *et al* recently recommended a one layer mass closure (23). In the case presented a two layered closure proved successful.

Waihenya in a review of a ureterovaginal fistula following a laparoscopic hysterectomy noted that in high risk cases, a high index of suspicion of the possibility of bladder or ureteral injury should always be mandatory even when the operative procedure appears easy (24).

## CONCLUSIONS

Intra-operative bladder injuries from gynaecological procedures are liable to occur due to the inherent anatomic and pathological factors in the pelvis. Every effort should be made to identify and rectify injuries during the intra-operative period. In high risk patients, where previous surgeries may predispose to injuries, it is of paramount importance to prevent and rectify such complications at the soonest.

It is important that in patients with previous scars, a good clinical evaluation of uterine mobility is performed before a laparoscopic hysterectomy is undertaken. Adequate skills in laparoscopic techniques are paramount, before these procedures replace the abdominal approach.

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