

## Combined Surgery for Intra-Abdominal Extra-Urinary Lesions in Patients with Renal and/or Ureteral Malignancies

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**Background:** The standard treatment for patients with renal and/or ureteral malignancies is radical nephrectomy or nephroureterectomy. Frequently, intra-abdominal extra-urinary lesions are noted preoperatively or intra-operatively in the gastrointestinal or gynecologic tract. We reviewed our experience with patients during an 11-year period.

**Methods:** From 1991 through 2001, 1059 patients underwent radical operations for renal and/or ureteral malignancies. Of these, 37 patients had simultaneous intra-abdominal extra-urinary lesions preoperatively or intra-operatively and underwent surgery for these lesions at the same time as nephrectomy or nephroureterectomy. These patients were designated as group A and were compared with group B patients who underwent only radical urological surgery.

**Results:** The distributions of age, gender, preoperative evaluations, and histology did not differ significantly between the groups. The most common intra-abdominal extra-urinary lesion was located in the gall bladder (51.4%). Although the patients with intra-abdominal extra-urinary lesions tended to have greater intra-operative blood loss ( $p=0.8621$ ), longer postoperative hospital stays ( $p=0.3414$ ), and higher complication rates ( $p=0.208$ ) than those who did not, the differences were not significant.

**Conclusions:** Given radical operations for renal and/or ureteral malignancies, synchronous surgery for intra-abdominal extra-urinary lesions is feasible and safe with thorough postoperative care.

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**Key words:** renal cancer; ureteral cancer, synchronous, extra-urinary lesion.

The standard treatment for patients with renal and/or ureteral malignancies is radical nephrectomy or nephroureterectomy.<sup>(1)</sup> Frequently, intra-abdominal extra-urinary lesions are noted preoperatively or intra-operatively in the gastrointestinal or gynecological tract. These lesions may be found more often due to the increasing use of computed

tomography (CT) or magnetic resonance image (MRI) for preoperative evaluation.<sup>(2,3)</sup> When lesions are found, the surgeon must decide whether it is appropriate to perform additional procedures at the same time as the radical genitourinary surgery. For example, cholelithiasis is a common disease and cholecystectomy is a technically simple procedure

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with low complication rates. Several researchers found that concomitant cholecystectomy at the time of radical genitourinary cancer surgery does not significantly increase morbidity, mortality, or postoperative hospital stay.<sup>(4,5)</sup> Although a gynecologist or a general surgeon would be consulted and help with the other procedures intra-operatively, the urologist should take most of the responsibilities for postoperative care. If the intra-abdominal extra-urinary lesions were also malignant or multiple, the postoperative clinical course or the following therapies might be complicated and unfamiliar.

After reviewing all the available literature, we found concurrent urological surgery and cholecystectomy.<sup>(4,5)</sup> There were no studies discussing the overall combination of genitourinary radical operations, and gynecological or gastrointestinal procedures performed simultaneously, regardless of whether the intra-abdominal extra-urinary lesion was benign or malignant. Therefore, we reviewed our experiences at the Chang Gung Memorial Hospital during an 11-year period to analyze these types of cases.

## METHODS

### Definitions

"Intra-abdominal extra-urinary lesion" was defined as an independent intra-abdominal lesion in a non-genitourinary organ in which the etiology is not related to the renal and/or ureteral malignancies.

### Patients

From 1991 through 2001, we retrospectively reviewed the medical records at the Chang Gung Memorial Hospital and found 1059 patients who underwent radical operations for renal and/or ureteral malignancies. Of these, 45 patients (4.2%) had simultaneous intra-abdominal extra-urinary lesions preoperatively or intra-operatively. The extra-urinary lesions in six patients were finally observed only after consulting gynecologists or general surgeons intra-operatively, and two patients underwent two separate operations for urinary and extra-urinary lesions during the same admission. These eight patients were excluded from our analysis. Among the remaining 37 patients (group A), 18 patients were men and 19 were women. Patients' ages ranged from 31 to 91 years (mean age, 62.6 years).

### Control group

Of the 1059 patients who underwent radical operations for renal and/or ureteral malignancies, 522 patients had urothelial tumors and 537 patients had renal parenchymal tumors. After excluding the patients with intra-abdominal extra-urinary lesions who had simultaneous surgeries, 37 patients from the remaining 1014 patients were chosen as the control group (group B) for comparison with group A. The group B patients were selected by an objective observer who was not involved in this study, based on the chart numbers only and his discretion. The patients in group B did not have intra-abdominal extra-urinary lesions and underwent only radical urologic surgery for treatment of their malignancies. A summary of the patients in groups A and B is shown in Table 1.

### Preoperative assessment

Among the 37 patients in group A, 24 patients (64.9%) came to our clinic for help because of genitourinary tract symptoms, e.g., hematuria, flank pain, or both. Nine patients (24.3%) were referred to our clinic from gastrointestinal clinics due to gastrointestinal discomfort, abdominal pain, or bowel habit change. The remaining four patients (10.8%) were diagnosed during health examinations and then referred to our clinic for further management. No patient was diagnosed and referred from the gynecology department.

In the preoperative evaluation, 25 patients (67%) had abdominal sonography. Thirty-three patients (89%) received abdominal CT and four patients (11%) underwent abdominal MRI. Most intra-abdominal extra-urinary lesions were found using these examination methods. To evaluate the urinary collecting system, intravenous pyelography was performed for 10 patients (27%) and retrograde pyelography was performed for 14 patients (38%). Six patients (16%) underwent renal angiography before surgery and 20 patients (54%) had bone scans to evaluate distant metastases.

Operations were done performed general anesthesia with an abdominal midline incision. Radical nephrectomy or nephroureterectomy was performed first, followed by surgery to remove the extra-urinary lesions (group A patients only). Pathological examinations revealed that there were 23 renal parenchymal tumors (62%) and 14 urothelial tumors (38%).

**Table 1.** Summary and Comparison of the Patient with/without Intra-Abdominal Extra-Urinary Lesions

	Number of patients (%)*		Statistical analysis ( <i>p</i> )
	Group A (37 cases)	Group B (37 cases)	
Age (years)	62.6 (31-91)	58.9 (21-84)	0.2406
Gender:			
Female	19	19	
Male	18	18	
Chief Complaints:			
Genitourinary symptoms	24 (64.9)	26 (70.3)	0.674
Gastrointestinal symptoms	9 (24.3)	6 (16.2)	
Incidentally findings	4 (10.8)	5 (13.5)	
Preoperative evaluation:			
Abdominal sonography	25 (67.6)	28 (75.7)	
Abdominal CT	33 (89.2)	31 (83.8)	
Abdominal MRI	4 (10.8)	7 (18.9)	
Intravenous pyelography	10 (27.0)	10 (27.0)	
Retrograde pyelography	14 (37.8)	12 (32.4)	
Angiography	6 (16.2)	3 (8.1)	
Bone scan	20 (54.1)	19 (51.4)	
Blood loss intra-operatively (mL)	462 (50-2500)	447 (50-1800)	0.8621
Postoperative data:			
Hospital stay (days)	11.2 (7-38)	10 (7-32)	0.3414
Complication (%)	8 (21.6)	4 (10.8)	0.208
Morbidity (%)	6 (16.2)	4 (10.8)	
Mortality (%)	2 ( 5.4)	0 ( 0)	
Pathological findings:			
Renal parenchymal tumor	23 (62.2)	23 (62.2)	
Urothelial tumor	14 (37.8)	14 (37.8)	

\*Group A: Patients with renal and/or ureteral malignancies with an intra-abdominal extra-urinary lesion. Group B: Patients with renal and/or ureteral malignancies only.

### Statistical analyses

Patient information was retrieved from medical records. Morbidity was defined as any peri-operative complication, and mortality was death in the hospital or within 30 days for patients discharged from the hospital.

Commercial software used for statistical analyses was WINKS Basic Edition, TexaSoft. The comparisons of age, intra-operative blood loss, and post-operative hospital stay between group A and B were calculated using Student's independent t-test. Statistical significance was defined as  $p < 0.05$ . The comparisons of chief complaints and complication rates between groups A and B were calculated using the chi-squared test.

## RESULTS

A general surgeon or a gynecologist attended to

all patients preoperatively or intra-operatively. Seven patients had gynecological lesions and six of these were found preoperatively. The other 30 patients consulted a general surgeon only; 28 consultations were performed preoperatively. Three patient consultations were performed intra-operatively because the intra-abdominal extra-urinary lesions were not identified during the preoperative evaluation.

Only three intra-abdominal extra-urinary lesions (8%) were malignancies and they included one colorectal, one appendiceal, and one hepatocellular carcinoma. Nineteen extra-urinary lesions (51.4%) were found in the gall bladder; 18 were cholelithiasis and one consisted of benign gall bladder nodules. In addition to the seven gynecological lesions, there were nine extra-urinary lesions in the liver. Two of nine patients with hepatic lesions also had gallstones. The remaining four patients had intestinal lesions. The details of these lesions are shown in Table 2.

**Table 2.** Summary of Intra-Abdominal Extra-Urinary Lesions

Extra-urinary lesions	No. Patients (Percentage, %)	Combined surgery
Gall bladder lesions*	19 (51.4)	
Gall stones*	18	Cholecystectomy
Chronic cholecystitis	1	Cholecystectomy
Hepatic lesions*	9 (24.3)	
Liver nodule	5	Wedge resection
Liver cyst	3	Wedge resection
Hepatocellular carcinoma	1	Lobectomy
Intestinal lesions	4 (10.8)	
Colorectal cancer	2	Hemicolectomy
Duodenal diverticulum	1	Excision
Mesothelioma	1	Excision
Gynecological lesions	7 (18.9)	
Ovarian cyst or mass	5	Salpingo-oophorectomy
Multiple uterus myoma	1	Total hysterectomy
Choriocarcinoma	1	Excision

\*There were 2 patients with gall stones and hepatic lesions together.

**Basic data and preoperative evaluation**

The gender ratio was similar between groups A and B. The mean age of group A (62.6 years) tended to be older than group B (58.9 years), but the difference was not significant ( $p=0.2406$ ). Although there were nine patients in group A referred from gastrointestinal clinics, six patients in group B had gastrointestinal complaints at first ( $p=0.674$ ). The preoperative evaluation results did not differ significantly between groups A and B.

**Blood loss**

The average blood loss during surgery for the 37 patients with intra-abdominal extra-urinary lesions

was 462 mL, ranging from 50 to 2500 mL. Twenty-four patients (65%) needed blood transfusions. The average blood loss for group B was 447 mL (50-1800 mL) and 14 patients (38%) needed blood transfusions. The average blood loss did not differ significantly ( $p=0.8621$ ) between groups A and B.

**Postoperative recovery**

Postoperative care was performed in the urology ward, however, four patients (11%) were transferred to another ward for further management. Two were transferred to have chemotherapy, one was transferred due to duodenal anastomosis leakage, and the remaining patient was transferred due to poor preoperative cardiac function (transferred back to cardiovascular ward for intensive care). The mean postoperative hospital stay of group A was 11.2 days and that for group B was 10.0 days ( $p=0.3414$ ).

**Complications**

There were six morbidities (16%) and two deaths (5%) among patients in group A (Table 3). Four patients (10.8%) with postoperative complications needed a second operation to resolve the problem. Two patients died due to poor cardiac function or cerebrovascular accident that was not directly related to the surgery. The complication rate for group A tended to be higher than for group B (4 morbidities and no deaths, 11%), but the differences did not reach statistical significance ( $p=0.208$ ).

**DISCUSSION**

Finding intra-abdominal extra-urinary lesions in patients undergoing radical operations for renal

**Table 3.** Complications: Morbidity and Mortality

Complications	Extra-urinary Lesions	No. of Patients in Group A	No. of Patients in Group B
<b>Morbidity</b>			
Wound infection/ dehiscence	Liver cyst	1	4
	Gall stone	2	
Abdominal abscess	Appendiceal tumor	1	0
Anastomosis leakage	Duodenal diverticulum	1	0
Re-bleeding	Gallstone	1	0
<b>Mortality</b>			
Cerebral vascular accident	Gallstone	1	0
Cardiac tamponade	Gallstone	1	0
Total		8	4

and/or ureteral malignancies is common. The frequency among our series of patients was 4.2%. Nonetheless, we believe that the frequency might actually be higher because some urologists might have overlooked intra-abdominal extra-urinary lesions or the patients might have been asymptomatic. Once intra-abdominal extra-urinary lesions are noted, we strongly suggest consulting a general or gynecological surgeon for further investigation and postoperative care if a concomitant operation is indicated.

Among our patients, the most common intra-abdominal extra-urinary lesions were gall bladder lesions and most were cholelithiasis. Researchers have found that gallstones are present in 15% to 20% of the population, with many being asymptomatic.<sup>(6,7)</sup> A plain abdominal X-ray film is the routine diagnostic examination for a patient with a urological disorder. Patients with renal and/or ureteral malignancies also undergo abdominal sonography and/or CT. These examinations help identify incidental gallstones among patients with urinary tract malignancies. Similarly, patients with gallstones undergo abdominal sonography, CT, or MRI, which may help to find incidental kidney masses.

Leaving the gallbladder with stones in a patient postoperatively carries a significant risk. In several large series of patients with asymptomatic cholelithiasis monitored for up to 20 years, patients had a 50% chance of developing symptoms attributable to cholelithiasis, and serious complications developed in 18% to 35% of the patients.<sup>(8-11)</sup> Acute cholecystitis following unrelated surgery is difficult to diagnose and has been associated with higher morbidity and mortality rates. Ottinger described 40 patients with postoperative acute cholecystitis resulting in a 47% mortality rate, and Glenn and Wantz reported a 10.9% mortality rate among his patients.<sup>(12,13)</sup> In our study, only one patient with gallstones did not undergo concomitant cholecystectomy and the patient was excluded from group A; this was because of poor general health, and this patient died 5 months later after surgery for the urological malignancy.

Rozanski et al.<sup>(5)</sup> first described six patients who underwent major urological surgery with simultaneous elective cholecystectomy in 1989 and no morbidity or increase in hospital stay was attributed to the additional biliary procedure. Debrock et al (1993) reported a larger series of 31 patients who underwent

cholecystectomy at the time of radical nephrectomy (25 patients), radical cystectomy, and radical prostatectomy; the complication rate was 13%, with five morbidities.<sup>(4)</sup> Among our 19 patients (group A) who underwent simultaneous cholecystectomy, two had morbidities, and unfortunately, the only two deaths occurred in patients who had simultaneous gallstone surgery. The complication rate was 10.8%. There was no evidence to prove a relationship between the biliary tract procedures and complications. Further study with a greater number of patients would be needed to prove or disprove this association. Our results showed that while cholecystectomy combined with urinary tract surgery is a simple procedure, and attention should be paid to postoperative care.

Multiple malignancies of one or more organs was first described by Billroth and later defined by Warren and Gates.<sup>(14,15)</sup> A review of the autopsy data by Hajdu and Hajdu suggested a strong association of renal cell carcinoma (RCC) with multiple malignancies.<sup>(16)</sup> RCC was the fifth most common initial primary cancer in their study, and the incidence of simultaneous colon and renal tumors was 0.1%.<sup>(16)</sup> In our study, there were four patients with simultaneous, double, primary malignancies, which were ascending colon carcinoma/right RCC, appendiceal adenocarcinoma/right RCC, hepatocellular carcinoma/right ureter transitional cell carcinoma, and cervical squamous cell carcinoma/left renal adenocarcinoma. In studies involving patients who had colorectal carcinoma, Polk et al reported the lowest frequency of simultaneous colon cancer and RCC to be 0.046%, out of an overall frequency of multiple malignancies of 3%.<sup>(17)</sup> Mider et al. in 1952, O'Boyle and Kemeny in 1989, and Lee et al. in 1982 reported higher frequencies of simultaneous colon and renal primary malignancies among patients with colon cancer as 0.33%, 0.5%, and 0.9%, respectively.<sup>(18-20)</sup> In 1998, Rabbani et al reviewed the records of patients with multiple primary malignancies in 551 RCC operations.<sup>(21)</sup> Synchronous colorectal malignancies occurred in 16 patients for a frequency of 2.9%, which was much higher.<sup>(21)</sup> The frequency of synchronous colorectal malignancies among our patients was 0.37% (2/537 renal parenchymal malignancies). In 1999, Amoroso et al reported a patient with synchronous colon and renal malignancies who underwent surgeries for both at the same time.<sup>(22)</sup> Kumar et al.<sup>(23)</sup> reported another renal transitional cell

carcinoma and right colon cancer but surgeries were separated, and occurred during a 3-month period. Both of these patients had good outcomes. Halak et al.<sup>(3)</sup> reviewed five synchronous colorectal and renal carcinoma patients from a total with 103 patients with colorectal malignancies. All underwent combined operative procedures in which both neoplasms were resected, without any complications.<sup>(3)</sup> In our study, two patients who underwent concurrent radical nephrectomy and hemicolectomy had longer postoperative hospital stays of 13 and 25 days (mean, 19 days), and one had a secondary operation for an abdominal abscess. Due to the absence of reports of large patient series, performing concurrent operations for colorectal and renal cancer is still controversial.

Making the distinction between a benign hepatic mass and metastatic RCC to the liver is crucial in evaluating a patient with renal cell carcinoma.<sup>(24)</sup> Wishnow et al.<sup>(24)</sup> reported two patients with benign liver lesions incorrectly diagnosed as metastatic RCC initially. Okajima et al.<sup>(25)</sup> reported a case of synchronous triple cancers that were RCC, hepatocellular carcinoma, and squamous cell carcinoma of the oral floor, resected simultaneously with good results. Bennett et al.<sup>(26)</sup> reviewed the records of 900 patients who underwent hepatic resections and found three patients who underwent radical nephrectomy with en bloc partial hepatectomy at the same time without any complications. Technically, it is feasible to perform a concomitant hepatic surgery with urological radical operations. Among our patients, of the nine patients with concomitant hepatic lesions, only one had a postoperative wound infection.

Newell et al.<sup>(27)</sup> reported that only four of 4871 patients (0.08%) with uterine cervical carcinoma had simultaneous RCC. Rabbani et al.<sup>(21)</sup> found three synchronous gynecological malignancies in 197 RCC patients (1.52%). We found a patient with cervical squamous cell carcinoma and left renal adenocarcinoma among our base of 537 female patients (0.19%), but that patient had two separate operations to remove these different tumors. We found no report discussing the feasibility and prognosis of concurrent radical genitourinary operations and gynecological procedures during our literature review. In our experience, we had no complications among the seven patients with simultaneous gynecological lesions.

Our study shows that intra-abdominal extra-urinary

lesions among patients undergoing radical operations for renal and/or ureteral malignancies were common. This appears to be due to the increasing use of abdominal and pelvic CT or MRI. The gall bladder was the most common site of intra-abdominal extra-urinary lesions. Although blood loss, postoperative hospital stays, and complication rates appeared to be higher among patients who undergo concurrent surgeries, more data is needed to prove this association. Synchronous extra-urinary surgery for abdominal lesions is feasible with a complete preoperative evaluation and thorough postoperative care.

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# 腎臟或輸尿管惡性腫瘤病患在接受根除性手術時合併腹腔內 非泌尿系統病灶之評估

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- 背景：** 面對腎臟或輸尿管惡性腫瘤，根除性切除手術是標準治療方式。但是，術前或術中有時會發現腹腔內合併非泌尿系統病灶。本研究之目的乃報告11年來的經驗。
- 方法：** 於1991年至2001年，計有1,059個病患因腎臟或輸尿管惡性腫瘤接受根除性切除手術，其中有37個病患在術中同時接受腹腔內非泌尿系統病灶之切除 (Group A)，我們另外隨機選取37個只接受腎臟或輸尿管惡性腫瘤根除性切除手術的病患 (Group B) 做比較。
- 結果：** 最常見的腹腔內非泌尿系統病灶在膽囊。不論年齡、性別、術前評估或腎臟或輸尿管惡性腫瘤的病理發現在兩組間都沒有特別的不同，雖然合併腹腔內非泌尿系統病灶有較多的術中失血 ( $p=0.8621$ )、較長的術後住院天數 ( $p=0.3414$ )、較高的合併症發生率 ( $p=0.208$ )，但都沒有統計學上的意義。
- 結論：** 腎臟或輸尿管惡性腫瘤病患在接受根除性手術時合併腹腔內非泌尿系統病灶之切除是可行的。  
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**關鍵字：** 腎臟腫瘤，輸尿管腫瘤，合併，非泌尿系統病灶。

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