Spontaneous Intraperitoneal Rupture of the Urinary Bladder after Radiotherapy for Cervical Cancer

Sun-Ouck Kim, Eu-Chang Hwang, Deok-Hyun Nam, Kwang-Sung Park, Dong-Deuk Kwon, Soo-Bang Ryu

From the Department of Urology, Chonnam National University Medical School, Gwangju, Korea

Spontaneous intraperitoneal bladder rupture is a rare complication of radiation therapy. We report an unusual case of spontaneous intraperitoneal bladder rupture 17 years after pelvic radiotherapy for carcinoma of the cervix in a 59-year-old woman who underwent prompt surgical repair. (J Korean Continence Soc 2009;13:163-5)

Key Words: Bladder, Radiation, Rupture, Spontaneous

Many patients suffer severe complications from radiation therapy for cervical cancer. Severe late complications are observed in 1.24% of patients after radiation therapy for gynecological cancer; these include irradiated bladders, ureteral strictures, and urinary fistulas [1]. Spontaneous intraperitoneal rupture of the urinary bladder is a rare complication of radiation therapy. Here, we present a case of spontaneous bladder rupture after whole-pelvis radiation therapy for cervical cancer.

Case Report

A 59-year-old woman was referred to the department of urology at the Chonnam National University Hospital with a 2-week history of slight gross hematuria and lower abdominal discomfort. She reported normal bowel function and no history of abdominal trauma. She had undergone treatment for stage Ib squamous cell carcinoma of the cervix by Wertheim hysterectomy followed by external beam radiation therapy 17 years previously. The radiation therapy had consisted of 1.8 Gy per day, 5 days per week, for a total of 45 Gy, combined with intracavitary radiation of 24 Gy in six fractions, once per week. No significant complications were reported, and no evidence of disease recurrence had since been documented in routine follow-up. Nevertheless, she reported a long history of several lower urinary tract symptoms after the surgery, including abdominal straining, a weak urinary stream, and tenesmus.

Physical examination on presentation revealed a distressed, but hemodynamically stable, patient with a distended abdomen and diminished bowel sounds. There was
Fig. 1. Preoperative cystography revealed leakage of the contrast medium into the abdomen from the urinary bladder.

marked guarding and mild rebound tenderness over the abdomen. Abdominal ultrasonography revealed significant fluid collection within the abdomen, but no other abnormality was identified in the abdomen or pelvic cavity. Cystography revealed leakage of contrast medium into the abdomen, suggesting intraperitoneal bladder rupture (Fig. 1).

Emergency surgery was performed with a preoperative diagnosis of intraperitoneal bladder rupture. No macroscopic evidence of malignancy was observed, and a perforation measuring 5×5 cm was identified on the dome of the bladder. The bladder margin at the site of injury appeared very pale, friable, and extremely thin, with an estimated bladder wall thickness of 2 mm, with adhesions to the adjacent bowel (Fig. 2). We excised the bladder wall around the perforation to exclude the possibility of malignant perforation, and the bladder was then repaired with interrupted absorbable sutures. An indwelling 16-Fr urethral catheter was inserted.

The patient’s postoperative recovery was uneventful. Cystography on postoperative day 21 revealed no extravasation of the contrast medium and a bladder capacity of 220 cc. Subsequently, the Foley catheter was removed and an attempt at self-voiding resulted in a voided volume of 137 cc at a maximal flow rate of 19.5 ml/s and 83 ml of residual urine. The patient continued small amounts of self-voiding, followed by intermittent self-catheterization. Histological examination of the excised bladder wall showed fibrous, chronic inflammation with diffuse edema without evidence of malignancy.

**Discussion**

A high radiation dose may lead to radiation injury of the adjacent organs, such as the rectum, bladder, and small bowel, of varying severities [2]. The reported rate of clinically relevant side effects following radiotherapy for primary carcinoma of the cervix was 10% overall and 2% to 3% for urological complications [3]. However, late complications of radiation therapy for cervical can-
Spontaneous Intraperitoneal Rupture of the Urinary Bladder after Radiotherapy for Cervical Cancer

cer, such as hematuria, fibrosis, contraction, and several fistulas, may occur in 5-15% of patients and are related to the dose and fractionation of the delivered dose and volume [4]. Fujikawa et al. [2] reported the incidence of spontaneous rupture of the urinary bladder to be particularly high after radiation therapy, reaching 2.0%. They suggested that the high incidence of radiation-induced complications, including spontaneous bladder rupture, is due to the use of high-dose brachytherapy. They also reported that the time to occurrence of complications was 6.4 years for the urinary tract. Urological complications are more likely to occur as long as 15-20 years after treatment. Our patient received radiotherapy 17 years previously with a dose of external beam pelvic radiation combined with intracavitary radiation therapy similar to that in the above-mentioned report. Physical examination may reveal signs of peritonitis, including tenderness and rebound tenderness, although the initial findings may be minimal, as in our case, which was detected 2 weeks later. The mortality rate associated with a delay in diagnosis of 24 hours or more is as high as 25% for spontaneous bladder rupture. Although in our case, surgical treatment was performed successfully 2 weeks later without any complications.

In summary, spontaneous intraperitoneal rupture of the urinary bladder is a rare complication of radiation therapy. A high index of suspicion is required for diagnosis of this rare manifestation of spontaneous bladder rupture in patients with a history of pelvic radiation therapy.

References