Urinary Diversions After Radiation for Prostate Cancer: Indications and Treatment

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OBJECTIVE To characterize the presentation and symptom progression culminating in urinary diversion after radiotherapy for prostate cancer at a tertiary care reconstructive urology practice. MATERIALS AND Retrospective review of electronic medical records was performed for all patients between 2005 **METHODS** and 2011 who underwent urinary diversion for urologic complications of radiation therapy for treatment of prostate cancer. We analyzed demographics, type of radiation, presenting symptoms, diagnostic evaluation, and surgical interventions. Of the 30 patients identified, 20% underwent external beam radiotherapy, 37% underwent RESULTS brachytherapy, and 43% underwent combination therapy. Average time from radiation treatment until presentation to our institution was 4.6 years. Overall indications for urinary diversion included fistula (37%), end-stage bladder (20%), devastated outlet (27%), and a combination of end-stage bladder and devastated outlet (17%). Types of urinary diversion included cystectomy with conduit diversion, conduit diversion alone, and chronic indwelling suprapubic catheter. Eight patients additionally required bowel diversion for intractable gastrointestinal symptoms. Patients underwent an average of 4.4 procedures attempting to salvage native voiding function before urinary diversion. CONCLUSION The reported need for urinary diversion after radiation therapy for prostate cancer is rare and thus indications have not been well characterized. We found that all of our patients with rectourethral fistula had prior placement of brachytherapy seeds. External beam radiotherapy resulted in a higher incidence of end-stage bladder dysfunction, whereas brachytherapy seed placement was more commonly associated with a devastated outlet. Surgical management for end-stage disease

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included cystectomy with conduit diversion, conduit diversion alone, and indwelling suprapubic

rostate cancer is the most common nondermatologic cancer among men. Incidence is rising because of widespread screening methods resulting in a higher rate of diagnosis and treatment of clinically localized disease.¹⁻³ With 15-year relative survival rates approximately 91.4%, quality of life after treatment of prostate cancer is becoming an increasingly important topic.¹ Use of radiotherapy in the treatment of prostate cancer has been rising over the past 30 years from 9.1% in 1973% to 26% in 2004 and up to 42% in men aged 65-74 years.¹⁻² Grade 4 genitourinary toxicity after radiotherapy, which can include decreased bladder capacity, severe hemorrhagic cystitis, fistula, organ failure, or need for urinary diversion, occurs in approximately 0%-8.8% patients depending on the definition of toxicity, type of radiotherapy, and time course of the analysis.⁴⁻¹⁰ However, the actual percentage of patients who require

urinary diversion, and the symptoms that culminate in the need for diversion, are relatively unknown. In our tertiary care reconstructive urology practice, we noted the presentation of patients with severe radiation toxicity at time frames relatively remote from their initial radiotherapy, which is often outside the reporting periods noted in the current radiation oncology literature. Because of the remote nature of their radiation-induced symptoms, we sought to better characterize the issues in this population that culminated in the need for urinary diversion after radiotherapy for prostate cancer.

MATERIALS AND METHODS

Institutional review board approval was obtained, and a retrospective electronic medical record review was performed on patients between 2005 and 2011 who underwent urinary diversion for complications of radiotherapy for prostate cancer. Thirty patients were identified and data analyzed including demographics, type of radiation, presenting symptoms, diagnostic evaluation, surgical interventions, and length of followup. We defined end-stage bladder as a decreased bladder capacity <100 mL, decreased bladder compliance demonstrated on urodynamic analysis, refractory detrusor overactivity at low

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Table 1. Demographics

Patients by Type of Radiotherapy	All	EBRT	Brachy	Combo
Total patients	30	6	11	13
Age at radiation (range)	67.5 (55-78)	66.4 (55-73)	67.1 (55-78)	68.4 (60-74)
Age at presentation (range)	72.4 (57-84)	72 (57-79)	72.3 (66-79)	72.8 (60-84)
Time from radiation to presentation (range)	4.6 (1-13)	4.2 (2-7)	5.2 (1-13)	4.2 (1-9)
Patients with pathology	12	1	7	4
Gleason grade 6	6	0	6	0
Gleason grade 7	4	1	1	2
Gleason grade 8	1	0	0	1
Gleason grade 10	1	0	0	1
Prior prostatic procedures	6	4	1	1
TURP	2	0	1	1
RRP	3	3	0	0
RALP	1	1	0	0
Salvage procedures	3	0	2	1
RRP	2	0	1	1
Cryotherapy	1	0	1	0
Follow-up after diversion in months (range)	26.9 (0-206)	14.5 (0-33)	25.4 (1-77)	34.0 (0-206)
AUASI at presentation (range) (n)	25 (10-35) (13)	12.5 (10-15) (3)	24.4 (11-35) (5)	32 (28-34) (5)
Pads per day at presentation (range) (n)	5.8 (1-12) (10)	7.0 (1-12) (4)	5.0 (5) (1)	5.0 (1-8) (5)

AUASI, American Urological Association symptom index; Brachy, brachytherapy; Combo, combination therapy; EBRT, external beam radiotherapy; n, number of patients; RALP, robotic-assisted laparoscopic prostatectomy; RRP, retropubic radical prostatectomy; TURP, transurethral resection of prostate.

volumes, and/or severe lower urinary tract symptoms. We defined a devastated outlet as having intrinsic sphincter dysfunction, recalcitrant bladder neck contracture (BNC), and/ or refractory urethral and prostatic stricture disease.

RESULTS

Thirty patients required urinary diversion for complications of radiation therapy for prostate cancer. Of these patients, 20% had undergone external beam radiotherapy (EBRT), 37% underwent brachytherapy, and 43% underwent combination therapy. Six patients underwent a prostatic procedure before receiving radiotherapy, including 2 transurethral resections of prostate, 3 radical retropubic prostatectomies (RRPs), and 2 robotic-assisted laparoscopic prostatectomies. Three patients received salvage procedures for biochemical recurrence, including 2 RRPs and 1 cryotherapy procedure. Mean age at the time of radiotherapy was 67.5 years, and patients presented to our institution on average 4.6 years after initial radiation treatment. At initial presentation, the mean American Urological Association Symptom Index score was 25, and patients without an indwelling Foley or condom catheter wore an average of 5.8 pads per day (Table 1).

Patients underwent an average of 4.4 operative interventions aimed at salvage of lower urinary tract function (range, 2-13) before receiving urinary diversion. Indications for urinary diversion included fistula in 37%, end-stage bladder in 20%, devastated outlet in 27%, and a combination of end-stage bladder and devastated outlet in 17%. Types of fistula included rectourethral (RUF) in 8 patients, urethrocutaneous in 2 patients, and pubovesical in 1 patient. All 8 patients with RUF had previously undergone brachytherapy seed implantation, 3 in monotherapy and 5 in combination therapy. Of the 2 patients

who underwent EBRT and developed fistulas, 1 was a pubovesical fistula secondary to bone necrosis and the other was an urethrocutaneous fistula that developed after a bladder rupture during bladder irrigation for clot retention and persisted despite cystorrhaphy. One brachytherapy patient developed an urethrocutaneous fistula after a subsequent abdominoperineal resection for colon cancer. Broken down by type of radiotherapy, in EBRT patients, 33% presented with fistula, 33% with end-stage bladder, 17% with devastated outlet, and 17% with a combination of end-stage bladder and devastated outlet. Among brachytherapy patients, 36% displayed a fistula, 18% had an end-stage bladder, 45% had a devastated outlet, and no patients had a combination of end-stage bladder and devastated outlet. For combination therapy patients, 38% demonstrated a fistula, 15% had an end-stage bladder, 15% had a devastated outlet, and 31% had a combination of end-stage bladder and devastated outlet (Fig. 1).

Types of urinary diversion include cystectomy with conduit diversion in 63%, conduit diversion alone in 17%, and chronic indwelling suprapubic catheter in 20% patients. Among the patients who underwent cystectomy, 12 of 19 (63%) underwent simple cystectomy and 7 of 19 (37%) underwent radical cystectomy. Additionally, 27% of patients required bowel diversion, all for the indication of RUF. In totality, 45% of patients with a fistula underwent cystectomy with conduit diversion, 36% with conduit diversion alone, and 18% were managed with a suprapubic catheter. Three of 8 patients had undergone a prior attempt to repair the RUF. In one patient, the York-Mason procedure was aborted because of the extent of the perifistula fibrosis, and a colostomy was performed with subsequent cystectomy with ileal conduit and proctectomy. Two other patients developed recurrent RUF Download English Version:

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