Solitary Plasmacytoma of the Penile Urethra Treated With Primary Radiotherapy

Introduction

Solitary plasmacytomas are localized, potentially curable collections of monoclonal plasma cells, accounting for less than 5% of plasma cell neoplasms.¹ Approximately 80% of solitary extramedullary plasmacytomas (SEPs) are found in the upper aerodigestive tract, with uncommon involvement of other sites including the GI tract, urogenital region, and epidermis.² SEPs of the urethra are rare, with up to eight published cases reported to date³⁻¹⁰ (Table 1). Here we describe a patient with SEP of the penile urethra managed with primary radiotherapy.

Case Report

A 35-year-old man presented to his primary care provider with 2 months of painless hematuria. Urinalysis excluded urinary tract infection, and computed tomography (CT) of the abdomen and pelvis showed no abnormalities of the genitourinary tract. Cystoscopy was performed and revealed a 3-cm papillary, irregular urethral lesion located between the penile and bulbar urethra. Figure 1 shows two cystoscopic views of the lesion, identified by a red asterisk. This was biopsied, with pathologic review showing amyloidosis with positive Congo red stain as well as a lambda light chain restricted plasma cell population, thought to be most consistent with extramedullary plasmacytoma (EP). Urine cytology was negative for neoplastic cells. Further systemic work-up was performed per the National Compre-

hensive Cancer Network (NCCN) guidelines for multiple myeloma.¹¹ A comprehensive metabolic panel including creatinine and albumin, complete blood count with differential, and serum levels of calcium, lactate dehydrogenase, beta-2 microglobulin, and C-reactive protein were all within normal limits. Results from a serum free light chain assay, serum quantitative immunoglobulin testing, 24-hour urine for total protein, and both serum and 24-hour urine protein electrophoresis and immunofixation electrophoresis revealed no evidence of an underlying monoclonal gammopathy. A bone marrow aspirate and biopsy including marrow immunohistochemistry and flow cytometry confirmed no evidence of neoplastic lymphoplasmacytic proliferation. A complete skeletal survey demonstrated no discrete lytic or blastic lesions of the visualized osseous structures. A postbiopsy positron emission tomography–CT revealed moderate focal [¹⁸F]fluorodeoxyglucose uptake in the mid-to-distal penile urethra with no corresponding soft tissue abnormality on CT (Fig 2; the blue arrow points to an area of residual [¹⁸F]fluorodeoxyglucose uptake).

The patient elected to undergo primary radiotherapy, and he was treated with image-guided, intensity-modulated radiation therapy to the penile urethra and inguinal lymph nodes to 45 Gy in 1.8 Gy per fraction, with a conedown to the penile urethra to an additional 5.4 Gy. He declined sperm banking and was treated with a testicular clamshell shield in place. Total radiation dose was 50.4 Gy prescribed to the 95% isodose line, which is outlined in red on images from CT-based radiation planning in Figure 3.

By 37.8 Gy, he developed grade 2 dermatitis limited to the skin folds of the groin, and by 45 Gy, his dermatitis progressed to grade 3 with moist desquamation at the penis and groin folds. This required

Table 1. Published Reports of Solitary Extramedullary Plasmacytoma of the Urethra

Author	Clinical History	Treatment Modality	Follow-Up at Time of Publication	Outcome
Campbell et al ⁸	73-year-old man with hematuria; his urethral tumor was thought to likely be a late metastasis from previous oral pharyngeal plasmacytoma	Distal urethrectomy	1 year	No evidence of disease
Bonnet et al ⁹	38-year-old man with dysuria and nocturia	Surgery with adjuvant radiation to 45 Gy	6 months	No evidence of disease
Mark et al ¹⁰	23-year-old woman with history of diethylstilbestrol exposure	Excisional biopsy with adjuvant radiation to 36 Gy	10 years	No evidence of disease
Witjes et al ³	39-year-old man with dysuria	Primary radiation to 46 Gy	1 year	Relapse at 1 year requiring urethrectomy, with no evidence of disease at 1 year after surgery
Mordkin et al ⁴	39-year-old man with dysuria, frequency, and penile pruritis	Primary radiation to 41.4 Gy	12 years	No evidence of disease or late radiation effects
Lemos et al ⁷	56-year-old woman with hematuria and dysuria	Surgical excision	3 years	No evidence of disease
Kraus-Tiefenbacher et al ⁵	35-year-old man with urinary hesitancy	Primary radiation to 45 Gy	3 years	No evidence of disease or late radiation effects
Gokce et al ⁶	51-year-old man with hematuria and palpable penile mass	Primary radiation to 40 Gy	6 months	No evidence of disease
Alcorn et al	35-year-old man with hematuria	Primary radiation to 50.4 Gy	1 year	No evidence of disease or late radiation effects

Fig 1.

narcotic pain control and a 1-week treatment break after which he was able to complete his remaining treatments without further complications. During the course of radiotherapy, he also reported up to grade 1 nausea and constipation, grade 2 dysuria managed with phenazopyridine, and grade 2 fatigue. He maintained a Karnofsky performance status of 90 throughout treatment.

At 1 year of follow-up, the patient continues to show no evidence of disease at the primary urethral site and no signs of systemic progression to multiple myeloma. He additionally reports no significant late radiation effects.

Discussion

SEPs generally present with symptoms related to location; all published cases of urethral SEP were identified due to hematuria or urinary irritative or obstructive symptoms. Because presentation with disseminated plasma cell disease is more common than involvement at a solitary site, the diagnosis of multiple myeloma must be excluded before initiating therapy for SEP. Standard laboratory and imaging work-up for multiple myeloma as recommended by NCCN guidelines is detailed in this case. When localized disease is confirmed, the preferred treatment modality is generally primary radiation, with sur-

gical management alone reserved for small, localized lesions for which resection can be performed without excess morbidity. The indications for adjuvant radiation remain unclear. Chemotherapy is typically reserved for management of disseminated disease.

For SEP of the urethra, four previously published case reports describe treatment with external beam radiation alone.³⁻⁶ Doses ranged from 40 to 46 Gy. One patient experienced local recurrence, reported by Witjes et al³ as occurring 1 year after primary radiation to 46 Gy. The patient was managed with urethrectomy and displayed no evidence of recurrent disease at 1 year postoperatively.³ The other cases showed no evidence of disease with follow-up ranging from 6 months to 12 years. There were no significant late radiation adverse effects reported.

Lemos et al⁷ report one case of SEP of the urethra managed with surgery alone. At 3 years of follow-up, the patient remained without evidence of disease. Of note, Campbell et al⁸ published the first case of EP of the urethra, also managed with surgical excision alone and with no evidence of disease at 1 year postoperatively. However, the patient had a history of oral pharyngeal EP treated with excision and radiation 7 years before identification of the urethral site, suggesting that the urethral EP was a late metastasis as opposed to an SEP.

Fig 2.

Fig 3.

The remaining two case reports^{9,10} describe treatment of SEP of the urethra with initial surgery followed by adjuvant radiation to 45 Gy and 36 Gy. At 6 months and 10 years of follow-up, respectively, neither patient had evidence of disease.

Because there is a relatively high rate of conversion from SEP to multiple myeloma, routine evaluation and screening for disseminated disease is recommended, generally every 3 to 6 months for the first 2 years and with decreasing frequency thereafter. Surveillance studies include serum and urine evaluation for monoclonal proteins, complete blood count, and serum creatinine, albumin, and calcium levels, with radiologic or endoscopic evaluation as indicated given location of the primary site. The median follow-up in the mentioned case reports is 2 years, which is relatively short, given that the median time to relapse is 2.5 years for SEPs.¹² Nonetheless, the preponderance of case reports of urethral EP—including our report of management with primary radiotherapy—reassuringly show no evidence of disease and no significant late effects following local therapy in this rare disease entity.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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