Pubic Bone Resection Provides Objective Pain Control in the Prostate Cancer Survivor With Pubic Bone Osteomyelitis With an Associated Urinary Tract to Pubic Symphysis Fistula

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OBJECTIVE To investigate pain intensity perception in prostate cancer survivors with pubic bone osteomyelitis with an associated urinary tract to pubic symphysis fistula before and after definitive surgical management.

MATERIALS AND METHODS We performed a review of an institutional review board-approved database of prostate cancer survivors with pubic bone osteomyelitis from 2010 to 2015. Demographic and clinical data were extracted. Pain scores were assessed in patients at varying points before and after definitive treatment using an 11-point numeric rating scale. Statistical analysis was performed using a Wilcoxon signed-rank test and NcNemar's test.

RESULTS We identified 16 patients with a median age of 72 who met inclusion criteria. Chronic narcotic use for pain management was noted in 6 of 16 (37.5%) patients preoperatively. No statistical difference was identified between the pain score at the time of diagnosis and after completion of conservative measures (5.5 vs 5.5, $P = .76$). A statistically significant decrease in median pain score at the first follow-up appointment was seen compared to the preoperative pain score (0 vs. 5.5, $P = .0005$). At a median follow-up of 9.4 months (interquartile range 3.7-16.5), a sustained decrease in the median pain intensity score was noted in our cohort compared to their preoperative baseline pain score (5.5 vs 0, $P = .0005$) and pain score at the time of diagnosis (5.5 vs 0, $P = .004$.)

CONCLUSION Pubic bone resection provides immediate and sustained improvement in pain intensity perception in the prostate cancer survivor with pubic bone osteomyelitis with an associated urinary tract to pubic symphysis fistula. UROLOGY 100: 234–239, 2017. © 2016 Elsevier Inc.

The most commonly recognized survivorship issues after treatment of prostate cancer are urinary incontinence and erectile dysfunction, which are well described in the literature.[1-4] However, pubic bone osteomyelitis with an associated urinary tract to pubic symphysis fistula represents an increasingly reported musculoskeletal complication of radiotherapy and ablative treatments for prostate cancer.[5-7] This clinical syndrome is typified by pelvic and thigh pain, difficulty with ambulation, and recurrent urinary tract and pelvic infections. The pain associated with this condition can significantly impact the quality of lives of patients and impede participation in the activities of daily living.

Some authors have anecdotally noted resolution of pain immediately after surgical management. The time course and duration of pain resolution in this population in response to surgical intervention are unclear. Patient-reported outcomes with regard to pain intensity perception are also limited. Our aim was to determine if pubic bone resection provides short-term and sustained objective pain control in prostate cancer survivors with pubic bone osteomyelitis, based on the 11-point numeric rating scale for standard reporting of pain assessment.

MATERIALS AND METHODS

Study Population, Study Design, and Workup

We conducted an institutional review board-approved review of prostate cancer survivors diagnosed with pubic bone osteomyelitis from 2010 to 2015. Patients who had clinical history and examination findings concerning pubic bone osteomyelitis were referred to the reconstructive urology service. All patients underwent magnetic resonance imaging of the pelvis as the definitive

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Figure 1. T2-weighted sagittal magnetic resonance imaging demonstrating a prostatic cavity with an associated prostatosymphyseal fistula (white arrow) in a patient with pubic bone osteomyelitis.

imaging modality to establish a diagnosis (Fig. 1). Physical examination was performed in each patient to assess for difficulty and/or pain with ambulation, and tenderness along the perineum, genitals, pubic region, or suprapubic region.

Once a diagnosis was established, a multidisciplinary algorithmic approach to the management of pubic bone osteomyelitis was implemented, which has been previously published.[6] Antimicrobial directed intravenous antibiotics for 6 to 8 weeks and temporary urinary diversion with catheter placement remain the mainstay of upfront conservative management. Hyperbaric oxygen therapy was provided to patients who have not undergone prior treatment. Those who did not demonstrate a satisfactory clinical response, as defined by continued debilitating pain at the conclusion of conservative therapy, or developed breakthrough suppurative infections while on antibiotic therapy were offered definitive surgical therapy.

Preoperative Pain Assessment and Management

The intensity and location of the pain were routinely assessed at each visit. We utilized the World Health Organization analgesic ladder, which has been supported as a tool in the management of cancer-related pain.[8] An 11-point verbal numeric rating scale was used to assess pain intensity levels during outpatient and inpatient assessments. The numeric rating scale for pain assessment has been validated as a standard means of assessment of acute and chronic pain perception.[9-11] The pain score provided by the patient at the time of diagnosis of pubic bone osteomyelitis served as the baseline. A total pain score of 0 was evaluated as "no pain." A pain score of 10 was defined as "the worst pain imaginable." A score from 1 to 4 was defined as mild pain, a score from 5 to 7 as "moderate pain," and any score greater than 7 as "severe pain." This clinical stratification for pain severity has been well examined and utilized in other clinical studies.[12-15]

Surgery

A lower midline laparotomy incision extending from below the pubic symphyseal cleft to several centimeters below the umbilicus was the standard operative approach for all patients to facilitate exposure of the pubic symphysis, pubic rami, and abdominal and pelvic viscera. An osteotome and mallet were used for resection of the pubic symphysis. Sequential pubic bone debridement was continued laterally along the pubic rami until all visible infected and necrotic bone was removed and bleeding edges were noted. In cases in which the bladder was deemed not suitable for surgical reconstruction, supratrigonal cystectomy or radical cystoprostatectomy was performed along with continent and incontinent urinary diversion, as well as fecal diversion, based on each patient's individualized assessment. The fascia was closed with a running polydioxanone suture, and the skin was closed with nylon sutures in an interrupted fashion. Pelvic drains were placed postoperatively in all patients.

Postoperative Pain Assessment and Management

Postoperative analgesia after surgery was managed with intravenous patient-controlled analgesia or patient-controlled epidural analgesia, which were managed and titrated by our Acute Pain Service. Nonsteroidal anti-inflammatories and acetaminophen were utilized as adjuncts for pain control based on assessment of each patient's needs. Patients were transitioned to oral hydromorphone or oxycodone when they were tolerating adequate oral intake. Postoperative pain assessment was performed by our nursing staff using the 11-point verbal numeric rating scale every 6 hours on the inpatient wards, as well as at each outpatient clinic visit appointment.

Data Collection and Statistical Analysis

Descriptive statistical analysis was performed with assessment of demographic and clinical characteristics of our patient population. The morphine milligram equivalents were calculated to compare individual narcotic needs within our cohort during their inpatient hospitalization and adjusted for length of stay. The patients' pain scores were extracted at the following time points: (1) at the time of diagnosis, (2) at the preoperative anesthesia assessment after completion of antibiotics and prior to surgical resection, (3) at the first postoperative follow-up appointment, and (4) at the last clinical follow-up documented in the medical record. Patients who underwent surgical intervention at our institution after failure of medical management met our inclusion criteria. Those who elected not to undergo surgical therapy had surgery at outside institutions, and those whose condition stabilized with conservative management were excluded from analysis. Parametric data were reported as mean ± standard deviation, and median ± interquartile range (IQR) was used for reporting nonparametric data. Frequency data are presented as percentages. Statistical analysis of paired continuous nonparametric and categorical variables was performed using Wilcoxon signed-rank test and McNemar's test, respectively. A $P < .05$ was considered statistically significant. Statistical analysis was performed with JMP Pro 12 (SAS institute, Cary, NC).

RESULTS

Patient Population

We identified 20 patients at our institution with a history of prostate cancer who were diagnosed with pubic bone osteomyelitis. Of this cohort, 16 patients with a median age of 72 (IQR 66-75) met our inclusion criteria. Follow up was available for all patients. A median of 8 years (IQR 1.8-14 years) was noted from the time of treatment of prostate cancer to a diagnosis of pubic bone osteomyelitis. Of