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Original article

Prospective trial comparing intraoperative flexible, rigid, and no cystoscopy after ultrasound-guided transperineal permanent seed prostate brachytherapy

John Sylvester [a], Matthew Perry [b], Erik Togerson [c], Jason Hinton [d, *]

[a] 21st Century Oncology, Bradenton, FL, USA
[b] Florida Urological Specialists, Sarasota, FL, USA
[c] Swedish Urology Group, Seattle, WA, USA
[d] Department of Radiation Oncology, Indiana University, Indianapolis, IN, USA

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ABSTRACT

Objective: This is a prospective trial comparing the impact of intraoperative flexible, rigid, and no cystoscopy on dysuria immediately after permanent seed prostate brachytherapy (PB). It prospectively documents the time course and characteristics of dysuria, as well as the rates of urinary retention post-PB. Furthermore, this study attempts to establish the utility of routine, post-PB cystoscopy, by documenting the incidence of finding significant pathology on cystoscopy.

Materials and methods: Between January 2003 and January 2007, 225 patients deemed by their physician to be candidates for PB alone were recruited to the study. Patients who had external beam radiation therapy and/or androgen deprivation therapy were excluded. Preimplant International Prostate Symptom Score (IPSS), urinary quality of life score, urine leakage score, Sexual Health Inventory for Men score, and Radiation Therapy Oncology Group Bowel Health Inventory Scores were obtained. Patients were assigned to one of the following three groups: intraoperative rigid cystoscopy, flexible cystoscopy, or no cystoscopy following PB. Patient self-administered questionnaires were given to the patient in the recovery room after PB. These questionnaires evaluated the intensity, type, and duration of urinary symptoms associated with the first four urinations post-PB. All patients were seen on postoperative Day 1 when the surveys were retrieved. Patients were then followed up every 3 months. Acute urinary retention (AUR) was documented in the follow ups. Frequencies of significant pathology (defined as bladder tumor, urethral stricture, or large blood clots) were documented at the time of cystoscopy. AUR rates were also evaluated by the isotope used (I^{125}, Pd^{103}, or Cs^{131}).

Results: A total of 225 patients were enrolled into this study, but only 194 patients could be analyzed for dysuria. Thirty-one patients were excluded from analysis (6, 13, and 12 patients from the rigid, flexible, and no cystoscopy groups, respectively). These patients did not return the questionnaire, or were in retention, and thus did not have dysuria scores to report. Baseline characteristics for the 194 patients in terms of preimplant IPSS, quality of life, prostate volume, and isotope used were well balanced between all three groups. There were no significant differences in dysuria between the three cystoscopy groups at any time point following PB. The mean dysuria score across all time points was 5.5 of 10, with 0 representing “no pain” and 10 representing “the worst possible pain.” Pain was most often characterized as “burning” (78%), whereas dysuria most commonly was “only during urination” (56%). AUR rates (6.8–9.5%) and duration of catheter dependence (10.5–19 days) were not found to be significantly different between the assigned groups. When results were stratified by isotope, patients treated with I^{125}, Pd^{103}, and Cs^{131} seeds experienced a 6%, 14%, and 0% retention rate, respectively. The I^{125} and Pd^{103} patients had similar pretreatment IPSS and prostate volumes. Seven percent of patients undergoing cystoscopy had significant findings. The most common finding was “clots thought too large to void” (3%). Seeds in the bladder/urethra occurred in 1% of cases. Only 0.7% of patients were found to harbor unsuspected bladder tumors.

* Corresponding author. Department of Radiation Oncology, Indiana University, 535 Barnhill Drive, RT 041, Indianapolis, IN 46202-5289, USA.
E-mail address: hintonja@iu.edu (J. Hinton).

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Conclusion: There was no significant difference in dysuria in the first four urinations post-PB between patients in the rigid, flexible, and no cystoscopy groups. Larger blood clots that may have been difficult to void, seeds in the bladder and/or urethra, and other abnormalities were found in 7% of patients who had cystoscopy. This may suggest that cystoscopy may be worthwhile post-PB. The incidence of AUR was not significantly different between the three cohorts.
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1. Introduction

Permanent prostate radioactive seed implantation has become a well-accepted primary treatment for clinically localized prostate cancer. Multiple reports demonstrate that well-performed brachytherapy at leading institutions could result in 5-, 10-, and 15-year biochemical relapse-free survival (BRFS) rates equal to those reported by top centers using radical prostatectomy or intensity modulated radiation therapy.[1–19] Although the risk of incontinence and impotence following brachytherapy is relatively low compared with radical prostatectomy, one of the major goals of brachytherapy currently is to further reduce any and all toxicities of treatment, including short-term side effects such as dysuria and acute urinary retention (AUR).[20–24]

Following permanent seed prostate brachytherapy (PB), patients often experience moderate to severe dysuria on initial urinations.[25] It has been a common, although not a universal, practice to use rigid cystoscopy at the end of an implant procedure to evaluate the overall condition of the urethra and bladder, and to evacuate any large blood clots and/or seeds.[26] One possible factor contributing to the dysuria and other postoperative urinary symptoms is the introduction of the rigid cystoscope. This may cause minor trauma to the urethra and prostate. In this regard, flexible cystoscopy can be utilized as it has the potential advantage of causing less trauma, and therefore, fewer or less intense postoperative urinary symptoms. Flexible cystoscopy with local anesthesia has previously been demonstrated to have significantly less postprocedure voiding discomfort than rigid cystoscopy under a general anesthetic.[27]

Cystoscopy is a well-accepted and widely used diagnostic and therapeutic tool in the field of urology, but currently little information is available about its potential risks and benefits for patients receiving PB.

The primary objectives of this study were to examine whether or not there are any significant differences between rigid, flexible cystoscopy, and no cystoscopy on postoperative dysuria and AUR. The secondary objectives were to document the need for cystoscopy in patients undergoing PB by documenting the incidence of significant pathology.

2. Materials and methods

The Swedish Medical Center Investigational Review Board and Western Investigational Review Board approved this prospective trial. A total of 225 patients undergoing PB as monotherapy were treated with I^{125}, Pd^{103}, or Cs^{131}. Isotope selection was determined by the treating physician. To reduce confounding factors, we did not include patients receiving supplemental external beam radiation therapy or androgen ablation therapy. In addition, patients with a history of prior transurethral resection of the prostate were excluded. At initial consultation, all patients filled out an International Prostate Symptom Score (IPSS) form. All patients were instructed to begin alpha blockers at least 4 days prior to the implant procedure. Preoperative and postoperative alpha blockers were used in 197 patients, preoperative alpha blocker use was not known in 20 patients, and postoperative alpha blockers were not needed in three patients. PB was performed using the standard Seattle transperineal, transrectal ultrasound, and template-guided preplan techniques, as described previously.[26,28] After informed consent was obtained, study participants were organized into the following cohorts: rigid cystoscopy, flexible cystoscopy, and no cystoscopy. If the urologist was unable to carry out a satisfactory flexible cystoscopy, a rigid cystoscopy using a 22-Fr cystoscope was performed. Patients were converted from no cystoscopy or flexible cystoscopy to rigid cystoscopy if pathological findings such as large blood clots, bladder tumors, or seeds embedded into the urethral mucosa were identified. Patients were ultimately grouped based on what technique they actually received and not based on what they were assigned to receive initially.

Prior to discharge from the ambulatory surgical center (ASC), patients had their Foley catheter removed and were given a survey form on which they noted the intensity and quality of the dysuria they experienced on the first four urinations after discharge. On postoperative Day 1, patients underwent a noncontrast prostate computer tomography scan for postoperative dosimetry purposes. Patients were then seen by their treating physician, turned in their dysuria scoring form, and filled out an IPSS form for comparison with their pretreatment IPSS form. Routine follow up continued every 3 months, alternating with the urologist and radiation oncologist for the 1st year and then every 6 months thereafter. At each visit, an IPSS form was filled out and the patient was interviewed to determine whether or not AUR had occurred in the interim. For out-of-town patients, follow up was arranged via telephone interviews and IPSS forms were faxed. The completed forms were then reviewed by their physicians. Follow-up documentation was obtained on all patients.

3. Results

Two hundred and twenty patients were included in the study; 74 patients were assigned to the rigid cystoscopy group, 88 to the flexible cystoscopy group, and 58 to the no cystoscopy group. Isotopes used were I^{125} (161 patients), Pd^{103} (56 patients), and Cs^{131} (3 patients). Several patients assigned to the no cystoscopy group or the rigid cystoscopy group demanded flexible cystoscopy on the day of the procedure. Three patients supposed to undergo rigid cystoscopy were converted to flexible cystoscopy because of their preference and/or a lack of available sterile rigid scope. Seven patients initially assigned to the no cystoscopy group were later converted to receive flexible cystoscopy due to their preference and/or difficulty in catheterization. No significant difference in dysuria intensity was noted between the three treatment arms on the first four urinations after discharge from the ASC (Table 1). The majority of patients experienced moderate to severe dysuria (Table 2). Typically, dysuria only occurred during urination; it rarely lasted more than 5 minutes after urination (Table 3). A vast majority of urinations were described as “burning” or “sharp” in quality (Table 1). Dysuria only lasted 1 day in 173/194 (89%) of the patients.

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