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Is a cystogram necessary after bladder cuff excision?

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ABSTRACT

Objective: Nephroureterectomy with bladder cuff excision is the current gold standard for the treatment of upper-tract urothelial carcinoma (UTUC). Currently, routine follow-up cystogram is performed prior to Foley catheter removal to evaluate the bladder cuff excision wound. The aim of this study was to investigate the role of the postoperative cystogram in the bladder cuff excision procedure.

Materials and methods: This was a retrospective study of 193 patients diagnosed with UTUC post nephroureterectomy and bladder cuff excision between January, 2010, and January, 2016. Patient demographics, performance of cystogram, types of bladder cuff excision, and postoperative outcomes were recorded. Patients were classified into two groups depending on whether or not routine postoperative cystogram was performed.

Results: A total of 125 patients were included in this study and, of these, 102 patients underwent routine cystogram on Postoperative Day 7 (Group 1), while 23 patients underwent Foley catheter removal on Postoperative Day 7 without any imaging studies (Group 2). Univariate analysis showed no differences in age, sex, comorbidities, surgical approach, or stage of the primary tumor. No patient from either group had urinoma, pelvic abscesses, and tumor growth from bladder cuff wound was not observed in any patient within the 1-year postoperative follow-up period. Both groups of patients had a similar rate of postoperative urinary tract infections with sepsis ($p = 0.639$), time to Foley catheter removal ($p = 0.630$), time to drainage tube removal ($p = 0.264$), and length of hospitalization ($p = 0.373$).

Conclusion: Foley catheter removal on Postoperative Day 7 after nephroureterectomy with bladder cuff excision without routine cystogram appears to be safe in the majority of the UTUC patients. A large, multi-institutional study is required before this method can be recommended for widespread clinical practice.

1. Introduction

Upper-tract urothelial carcinoma (UTUC) is relatively rare in the West, accounting for just 1–5% of all urinary-tract urothelial carcinomas. However, in areas of Taiwan where Blackfoot disease is endemic, the reported incidence of UTUC ranges from 20% to 31%.[1,2] Nephroureterectomy with excision of the normal bladder cuff and bladder mucosa, using either a laparoscopic or an open approach, is the current gold standard for treatment in the majority of patients with UTUC.[3]

Access to the pelvic area for bladder cuff excision is attained using a transvesical, extravesical, or transurethral incision technique. Li et al[4] compared these methods and found no differences in recurrence-free and cancer-specific survival. A bladder wound results regardless of the surgical approach chosen. After the procedure, tube draining (Foley catheter) is required for 7–10 days to ensure proper healing of the bladder.[5,6]

Recent studies have reported that the urethral draining tube should remain in place until cystogram is performed.[7,8] However, in our experience, the majority of postoperative cystograms of patients who underwent bladder cuff excision showed no extravasation. Even when a cystogram was not obtained, the Foley catheter was generally

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removed smoothly without complaint. In addition, there is currently no evidence for the benefits of the postoperative cystogram. The aim of this study was to evaluate the role of the postoperative cystogram in the context of the bladder cuff excision procedure.

2. Materials and methods

All patients diagnosed with UTUC post nephroureterectomy and bladder cuff excision at the Kaohsiung Medical University Hospital, Kaohsiung, Taiwan between January, 2010, and January, 2016 were identified based on their discharge diagnosis and were enrolled in this study. Exclusion criteria for this study were: loss of postoperative follow-up records in the first year, incomplete postoperative records, transvesical bladder cuff excision, bilateral nephroureterectomy, a diagnosis in combination with a bladder tumor or partial cystectomy, patients with a transplanted kidney, and preoperative end-stage renal disease under dialysis. Demographic information, pathologic stages, surgical approach, and postoperative outcomes were recorded. Postoperative outcomes included sepsis due to urinary tract infection (UTI), leakage on cystogram, time to drainage tube removal, length of hospitalization, and tumor growth from the bladder cuff wound within 1 postoperative year on follow-up.

Patients were classified into two groups based on whether a routine postoperative cystogram was obtained or not in accordance with the criteria cited above; Group 1 included patients who underwent routine postoperative cystogram while Group 2 included patients who did not.

In our hospital, certain doctors did arrange for a routine postoperative cystogram to be obtained on Postoperative Day 7, while the majority of senior doctors did not. Cystogram protocols in our hospital call for the bladder to be filled with 150–200 mL of contrast dye, depending on bladder size and patient comfort. The catheter was removed immediately if no leakage was found. If leakage was present, the catheter was left in place for an additional 7–10 days and cystogram was repeated until no leakage was found. Patients who did not undergo the routine postoperative cystogram had their catheters removed on Postoperative Day 7 without radiographic imaging.

This study was approved by the Institutional Review Board at Kaohsiung Medical University Hospital. Statistical comparisons of continuous data between the two groups were performed using the Mann–Whitney *U* test. Categorical data were compared using Fisher's exact test. Pathologic stage data were compared using Spearman's rank correlation. A p value ≤ 0.05 was considered statistically significant.

3. Results

A total of 193 patients diagnosed with UTUC post nephroureterectomy with bladder cuff excision were identified. Of these, 125 patients were included in the study, while 68 patients met the exclusion criteria (Figure 1). Of the 125 patients enrolled in the study, 102 underwent a routine cystogram on Postoperative Day 7 prior to removal of the Foley catheter (Group 1) while 23 patients had their Foley catheters removed on Postoperative Day 7 without imaging studies (Group 2). No significant differences were noted between the two groups with respect to patient age, sex, coexisting medical illness (diabetes mellitus), stage of the primary tumor, or the technique used for bladder cuff excision (extravesical approach and transurethral incision of the ureteral orifice; Table 1).

In all cases of extravesical approach bladder cuff excision, the defect in the bladder wall at the ureteral hiatus was closed in whole layers from within the bladder with a single 2-0 coated VICRYL (polyglactin 910, Ethicon, Inc., Cornelia, GA, USA) suture. In all cases of transurethral incision of the ureteral orifice, a circumferential 1 cm incision was made around the ureteral orifice under direct vision using a Collins knife at 80 W with pure cutting current. The bladder cuff resection site was not closed in all patients who underwent a transurethral incision of the ureteral orifice.

In Group 1, routine cystogram was performed on Postoperative Day 7 and a small leakage was observed in a single patient. This was a 70-year-old male patient who had refuted the presence of diabetes mellitus, hypertension, or any other underlying disease prior to surgery. Transurethral incision of the ureteral orifice was performed as a bladder cuff excision for this patient. After surgery, his recovery was smooth and the pathology reports showed transitional cell carcinoma in the left renal pelvis in which the pathologic stage was pT3N0. In addition, no increased postoperative drainage was observed. However, the postoperative cystogram showed the collection of a small amount of extravasated contrast in the postdrain film on Postoperative Day 7 (Figure 2). A repeat cystogram was obtained on Postoperative Day 11 and showed resolution of the leak (Figure 2) and the Foley catheter was removed on Postoperative Day 12. No UTI or other complaints were recorded during the 1-month postoperative follow-up period at our hospital. Six patients with postoperative UTIs with sepsis were observed in Group 1. One patient was transferred to our intensive care unit due to severe sepsis and prolonged length of hospitalization and drainage tube removal were noted. Although more cases of postoperative UTIs with sepsis were observed in Group 1 when compared with Group 2, there was no significant difference ($p = 0.639$). In Group 1, the mean time to Foley catheter and drainage tube removal was 7.05 days and 9.07 days, respectively (Table 2).

In Group 2, all Foley catheters were removed on Postoperative Day 7. The mean time to drainage tube removal was 9.21 days. There was no significant difference in drainage tube removal ($p = 0.264$) and Foley catheter removal ($p = 0.630$) when comparing the two groups. Although leakage was not assessed in Group 2 as image studies were not conducted, there was no obvious clinical evidence of leakage in these patients.

In all patients, no clinical signs or symptoms of urinoma or pelvic abscesses were observed within the 1-month follow-up period. All patients experienced an uneventful postoperative recovery period. Both groups of patients had similar lengths of hospitalization ($p = 0.373$; Table 2). In all patients, cystoscopy performed within the 1-year follow-up period showed a well-healed bladder cuff wound and no tumor growth from the wound. In addition, abdominal computed tomography performed within the 1-year follow-up period showed no urinoma or pelvic abscesses in all patients.

4. Discussion

In the past, postoperative Foley catheterization for 7 days was standard to ensure bladder wound healing. Recent expert recommendations and studies have proposed that the urethral draining tube should remain in place until routine cystogram is performed. The results of such studies, however, showed almost no leakage on routine postoperative cystogram. Seifman et al[9] compared surgical approaches for bladder cuff excision and nephroureterectomy and found no leakage on postoperative cystogram. Similarly, in the case series presented here, only one patient had a small leakage on the cystogram on Postoperative Day 7, and essentially no leakage was noted in most of the patients.

Gomez et al[10] performed cystogram 10 days after injury to the bladder and found that > 85% of extraperitoneal bladder rupture wounds were healed by this time. Furthermore, Inaba et al[11] reported that all simple bladder injuries in their research had a negative postoperative cystogram; they noted that routine follow-up cystograms did not affect the clinical management of those patients undergoing repair of a simple intraperitoneal bladder disruption. There are three types of surgical approaches for bladder cuff