Urology Case Reports 17 (2018) 53–55

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Oncology

Management of advanced adenocarcinoma in Indiana Pouch urinary diversion

Michael A. Bell [a, *], Edward J. Wright [a], Sandy H. Fang [b], Michael H. Johnson [a], Nikolai A. Sopko [a]

[a] The James Buchanan Brady Urological Institute and Department of Urology, The Johns Hopkins University School of Medicine, 1800 Orleans Street, Marburg 420, Baltimore, MD 21287, USA
[b] Department of Surgery, Ravitch Division of GI Surgery, The Johns Hopkins University School of Medicine, 1800 Orleans Street, Sheikh Zayed Tower, Baltimore, MD 21287, USA

ARTICLE INFO

Article history:
Received 29 December 2017
Accepted 10 January 2018
Available online 11 January 2018

Keywords:
Adenocarcinoma
Indiana Pouch
High microsatellite instability

ABSTRACT

Adenocarcinoma is a rare finding following urinary diversion with gastrointestinal segments. This report describes an 80-year-old woman with a history of bladder cancer who subsequently developed a pT4 adenocarcinoma 8 years following her radical cystectomy and Indiana Pouch continent urinary diversion. An en bloc resection of the pouch and affected small bowel was performed and the patient underwent conversion to an ileal conduit diversion. We use this case to highlight a mechanism for possible pathogenesis and the management of adenocarcinoma in urinary diversions including the need for regular surveillance and the surgical approach.

1. Introduction

Adenocarcinoma is a known complication of urinary diversion with gastrointestinal substitution, though its pathophysiology remains unclear. The dominant theory of pathogenesis is understood as the generation of the carcinogen nitrosamine due to exposure of urine.[1] This pathogenesis occurs most frequently following ureterosigmoidostomy with more than 10% of patients developing neoplasia following this form of urinary diversion.[2] The Indiana pouch is comprised of approximately 30 cm of the proximal right colon for pouch formation in continuity with 10 cm of the terminal ileum for the catheterizable channel and utilizes the ileal cecal valve for continence. Prior attempts to determine tumor risk of incontinent and continent urinary diversion have been inconclusive.[3] Proposed surveillance protocols include cystoscopy screening with regular intervals starting 10 years after diversion.[1] Here we present a rare case of an 80-year-old woman with a history of bladder cancer who developed adenocarcinoma in her Indiana pouch 8 years after its creation. The tumor was found to have high microsatellite instability (MSI-H), which could be familial but can be sporadic in 10–15% of patient with the incidence increasing with age.[4] MSI-H cases are caused by deficits in mismatch repair genes. In sporadic cases, the cancer is typically caused by somatic methylation of the gene promoter for the mismatch repair gene *MLH1*.[4] This has been found to be a key player in the pathogenesis of colorectal cancer.

2. Case presentation

The patient is an 80-year-old female with a history of T1 urothelial carcinoma of the bladder status post radical cystectomy and Indiana pouch construction. She was first diagnosed with bladder cancer in July 2007. She underwent several TURBT and BCG for 6 weeks. She then underwent complete resection in 2009 with creation of an Indiana pouch. She had regular follow-up with labs and imaging every 6–12 months. She presented to clinic in February 2017 complaining of hematuria and worsening difficulty catheterizing her stoma. Her family history includes cervical cancer, Hodgkin's cancer and colon cancer. She is a former smoker with a 30-pack year history. Her last colonoscopy two years ago did not demonstrate disease.

A CT scan in February 2017 revealed a 3.3 × 3.6 cm mass in the Indiana pouch concerning for adenocarcinoma (Fig. 1A). There was no radiographic evidence of disease outside of the pouch. Follow up cytoscopy of her Indiana pouch revealed a large mass. Biopsy revealed moderately differentiated adenocarcinoma with

* Corresponding author.
E-mail address: jbell51@jhmi.edu (M.A. Bell).

https://doi.org/10.1016/j.eucr.2018.01.008

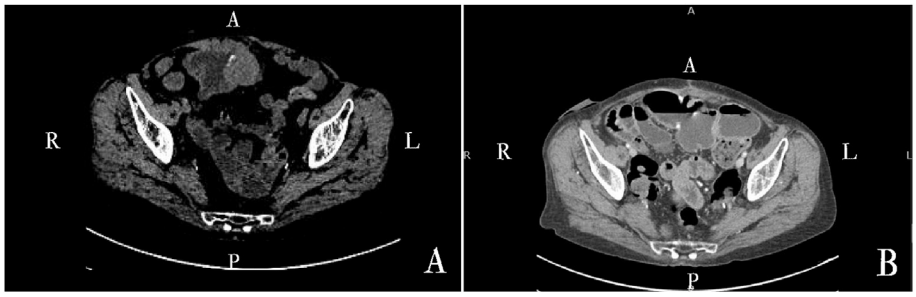

Fig. 1. Abdominal CT A. CT of the abdomen without contrast. A large 3.6 × 3.3 cm mass seen within the Indiana pouch. B. CT of the abdomen with IV contrast at four-month follow-up. Status post cystectomy and partial right hemicolectomy with right lower quadrant ileal conduit. No evidence of metastatic disease.

mucinous differentiation arising in a background of intestinal type mucosa. Her creatinine was 1.17 mg/dL, eGFR 44, and hemoglobin 11.6 g/dL. Urinalysis gross exam reveal that her urine was cloudy, WBC esterase 3+, protein 2+, occult blood 2+, urine nitrite was positive, WBC >30, RBC 3-10 and her urine had moderate bacteria.

Treatment options were discussed with the patient with the gold standard being removal of the pouch, right colectomy and ileal conduit creation. The surgical team comprised of urologic and colorectal surgery teams. The stoma was sewn shut at the beginning of the case and the ostomy was dissected free, taking care not to violate the catheterizable channel and to include a margin of surrounding tissue when possible. Two loops of distal ileum were densely adherent to the Indiana pouch concerning for invasion and the anterior portion of the pouch was adherent to the pubic bone. Following release of the pouch from the surrounding soft tissues, a formal right hemicolectomy and small bowel resection (including prior bowel anastomosis) to the level of the involved ileum was performed. An ileal conduit urinary diversion was performed using a Wallace ureteral anastomosis. Intra-operative pathology found the surgical margins including the pubic symphysis to be negative for malignancy. Upon opening the specimen, there was a very large cancer with definite invasion into two loops of small bowel, which were resected (Fig. 2). The margins of the small bowel adherent to the T4 tumor were found to be negative with no positive nodes (0/22) nor evidence of perineural or lymphovascular invasion. Molecular study showed that the tumor had high microsatellite instability (MSI-H).

The patient had an otherwise uneventful postoperative course and was discharged on post-operative day 5 with scheduled home care visits. Medical oncology was consulted and determined to forgo adjuvant chemotherapy. Surveillance including serial exams, laboratory studies including tumor marker, CT imaging and colonoscopy was recommended. The patient had a clear CT at four months follow-up (Fig. 1B). Genetic counseling was determined useful given that she has a strong family history of multiple cancers and that MSI-H intestinal cancer could be associated with a familial cancer syndrome and the patient was referred accordingly.

3. Discussion

Our patient presented with hematuria and difficulty with catheterization, which are the two most common initial symptoms previous literature has described for adenocarcinomas arising in the Indiana pouch.[5] Other findings may include pouch distension, malodorous discharge, overflow incontinence, lithiasis or abdominal pain. Our patient also presented 8 years following the procedure, which is consistent with the mean time to neoplastic transformation described in the literature.[5] We recommend close follow-up with cystoscopy and colonoscopy beginning at 10 years or earlier if symptomatic.

Other hypotheses surrounding tumor formation in adenocarcinoma of the Indiana pouch attribute it to chronic inflammation such as from stones and carcinogens.[5] MSI-H tumors are typically found in an immunologically active environment predominated by lymphocytes consistent with chronic inflammation.[4]

Following Indiana Pouch creation, we survey our patients with cystoscopy when symptomatic. If indicated, neoadjuvant chemo is administered. Surgically, adenocarcinoma masses are approached as primary adenocarcinomas with avoidance of tumor spillage and adequate soft tissue margins. Post-operatively, adjuvant therapies for adenocarcinoma are applied.

4. Conclusion

This case presents a rare patient with T4 MSI-H adenocarcinoma in an Indiana pouch with invasion into adjacent small bowel. It

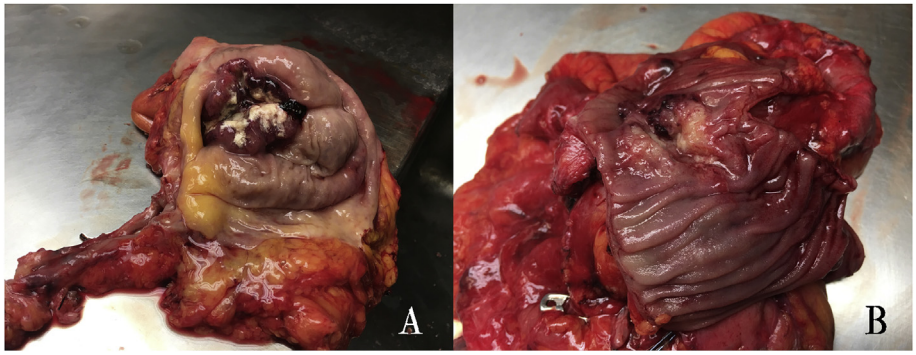

Fig. 2. Gross Pathology A. Large mass measuring 3.3 × 3.6 cm within the pouch demonstrated small focal eccentric calcifications. B. Tumor invasion into two loops of bowel in en bloc specimen.

reiterates the need for regular surveillance of malignant transformation in patients with urinary diversion and explores a possible mechanism for pathogenesis.

Conflicts of interest

The authors have no funding or conflicts of interest to disclose.

References

1. Manka MG, Santoni C, Wright EJ, Gearhart SL. Tubular adenoma in the Indiana pouch of a patient with a history of bladder exstrophy. *Urol Case Report*. 2015;3(5):141–142. https://doi.org/10.1016/j.eucr.2015.06.006.
2. Austen M, Kälble T. Secondary malignancies in different forms of urinary diversion using isolated gut. *J Urol*. 2004;172(3):831–838. https://doi.org/10.1097/01.ju.0000134890.07434.8e.
3. Amini E, Djaladat H. Long-term complications of urinary diversion. *Curr Opin Urol*. 2015;25(6):570–577. https://doi.org/10.1097/MOU.0000000000000222.
4. Gatalica Z, Vranic S, Xiu J, Swensen J, Reddy S. High microsatellite instability (MSI-H) colorectal carcinoma: a brief review of predictive biomarkers in the era of personalized medicine. *Fam Canc*. 2016;15(3):405–412. https://doi.org/10.1007/s10689-016-9884-6.
5. Saba N, Saba J, Janbain M, Bitar C, Lipsky A, Blaya M. Cancer of the Indiana pouch: a case report and review of the literature. *Clin Genitourin Canc*. 2013;11. https://doi.org/10.1016/j.clgc.2013.07.001.