Oncology

Adenoma-carcinoma Sequence in the Bladder After Augmentation Cystoplasty

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ABSTRACT

We present a case of a 64-year-old woman showing multistep progression from adenoma to adenocarcinoma in the bladder 46 years after augmentation ileocystoplasty. She underwent augmentation ileocystoplasty for tuberculous contracted bladder at 18 years. After 44 years, tubulovillous adenomas were found and resected at the ileovesical anastomosis site. After 2 more years, bladder tumors recurred and revealed adenocarcinomas. Finally, radical cystectomy was required because of frequent recurrence and tumor extensiveness. To our knowledge, this is the first case demonstrating adenoma-carcinoma sequence histopathologically in the bladder after augmentation cystoplasty, indicating multistep carcinogenesis similar to intestinal carcinogenesis.

Introduction

Augmentation cystoplasty using an intestinal tract is indicated for patients with a deterioration of bladder storage function resistant to pharmacologic or other conservative interventions. For example, patients with neurogenic bladder caused by spinal cord injury, contracted bladder caused by urogenital tuberculosis, or interstitial cystitis are candidates for augmentation cystoplasty. Malignant transformation of primary or substitutional bladder epithelium after augmentation cystoplasty is rare and needs a long postoperative period. However, these malignant tumors are frequently aggressive and associated with a poor prognosis, and the mechanisms of carcinogenesis are unclear.

We previously reported a case of a 62-year-old woman with tubulovillous adenoma that developed 44 years after ileocystoplasty. Two more years later, she developed bladder adenocarcinoma. The adenoma-carcinoma sequence has been implicated in the multistep processes of intestinal carcinogenesis in colon cancer. To the best of our knowledge, this is the first case report to provide histopathologic evidence of the adenoma-carcinoma sequence in the bladder after augmentation cystoplasty.

Case presentation

A 16-year-old female patient underwent right nephrectomy for renal tuberculosis. Augmentation ileocystoplasty for tuberculous contracted bladder was performed at 18 years. Left nephrostomy was required at 38 years because of hydronephrosis and repeated pyelonephritis.

In March 2005, 44 years after ileocystoplasty, the patient presented at our hospital with gross hematuria. Cystoscopy revealed multiple papillary tumors in the region of the ileovesical anastomosis. Transurethral resection of the bladder tumor (TURBT) was performed. Histopathologic examination revealed tubulovillous adenoma (Fig. 1A). The tumor recurred 4 times, necessitating repeated TURBT in April 2005, November 2007, March 2008, and October 2008. Histopathologic diagnosis was tubulovillous adenoma at the second TURBT in 2005, but the diagnosis of well-differentiated adenocarcinoma, pTa, (Fig. 1B) was made at the third TURBT in 2007, 46 years after ileocystoplasty. The fourth and fifth TURBT also revealed well-differentiated adenocarcinoma.

In January 2009, radical cystectomy with ileal conduit diversion was performed because of incomplete resection during the fifth TURBT. Macroscopic findings (Fig. 2A) and histologic examination (Fig. 2B) revealed that the tumor developed around the region of ileovesical anastomosis. Histopathologic diagnosis was well-differentiated adenocarcinoma, pTa, u-I0, u-I0, u-I0, u-I0, u-I0, u-I0, pN0 (Fig. 2B). The postoperative course was uneventful, and the left nephrostomy catheter was removed. She has been recurrence and metastasis free until December 2013.
Discussion

Malignant transformation of primary or substitutional bladder epithelium is relatively rare, with an approximate risk of 1.2% in patients treated with augmentation cystoplasty. Malignant tumors may develop over long periods, usually more than 10 years, in augmented bladders. However, these malignant tumors are frequently aggressive and cause the death in nearly 50% of patients.

Bladder tumors after augmentation cystoplasty are generally adenocarcinoma most commonly located in the region of enterovesical anastomosis, in which urothelial cells at the site of the anastomosis may be susceptible to intestinal metaplasia. Previous reports have shown that urothelial cells at the enterovesical junction acquire characteristic of the enteric epithelium in an experimental canine model of augmentation cystoplasty. Furthermore, a variety of gene aberrations have been found in the region of enterovesical anastomosis in patients treated with ileocystoplasty, such as chromosomal numerical abnormalities in chromosomes 18, 9, and 8, and p53 mutations. These findings suggest that multiple factors are involved in the bladder carcinogenesis after cystoplasty.

Intestinal carcinogenesis is known to be a multistep process called adenoma–carcinoma sequence, progressing from adenoma to adenocarcinoma, involving various oncogenic factors. Our case newly demonstrated adenoma–carcinoma sequence histopathologically in the bladder after augmentation cystoplasty. Our findings suggest that multistep carcinogenesis develops in the region of enterovesical anastomosis after cystoplasty as the intestinal carcinogenesis.

Late diagnosis of the diseases at an advanced stage accounts for the poor prognosis of patients with malignancies after cystoplasty. In our case, the malignancy was fortunately discovered at the stage of tubulovillous adenoma, and a good prognosis was achieved. Our experience in the current case suggests that detection at the early stage of carcinogenesis improves patient prognosis in malignancies after augmentation cystoplasty.

Conclusion

Carcinogenesis in the bladder after augmentation cystoplasty may be a multistep process, progressing adenoma to adenocarcinoma, and detection at the early stage of carcinogenesis would be important for patient prognosis.

Conflict of interest

The authors of this article have no conflict of interest.

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