Inguinal canal recurrence of colorectal adenocarcinoma following cytoreductive surgery and intraperitoneal hyperthermic chemotherapy

Jeffrey J. Tomaszewski, MD, Marc C. Smaldone, MD, Ronald M. Benoit, MD
Department of Urology, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, USA

TOMASZEWSKI JJ, SMALDONE MC, BENOIT RM. Inguinal canal recurrence of colorectal adenocarcinoma following cytoreductive surgery and intraperitoneal hyperthermic chemotherapy. The Canadian Journal of Urology. 2008;15(6):4428-4430.

Peritoneal carcinomatosis, the second most common cause of death among patients with colorectal carcinoma, may be managed with cytoreductive surgery and adjuvant intraoperative peritoneal hyperthermic chemotherapy (IHPC). We present the case of a 35-year-old male with locally recurrent colorectal adenocarcinoma in the inguinal canal and testis following intraperitoneal debulking and IPHC. When communicating with the peritoneal cavity, the inguinal canal may act as an anatomic sanctuary site and allow peritoneal carcinomatosis to escape the effects of intraperitoneal chemotherapy.

Key Words: spermatic cord, sanctuary site, recurrence, intraperitoneal hyperthermic chemotherapy

Introduction

Intraoperative peritoneal hyperthermic chemotherapy (IPHC) is used as adjunctive therapy to cytoreductive surgery to treat peritoneal carcinomatosis of colorectal origin. Arising as an extension of the peritoneal cavity, a patent processus vaginalis may function as an anatomic sanctuary site allowing tumor cells to potentially escape IPHC therapy. We report a case of a locally recurrent colorectal adenocarcinoma presenting as a spermatic cord mass within the inguinal canal following IPHC.

Accepted for publication October 2008

Address correspondence to Dr. Jeffrey J. Tomaszewski, Department of Urology, Kaufman Building, Suite 700, 3471 Fifth Avenue, Pittsburgh, PA,15213 USA

Case

A 35-year-old male underwent a sigmoid colectomy followed by adjuvant fluorouracil (5FU) and leucovorin for a T4 primary colorectal adenocarcinoma. Two years later the patient developed an abdominal mass and abdominal carcinomatosis. He underwent radical surgical debulking with hyperthermic peritoneal mitomycin chemotherapy. At the time of debulking, an intraabdominal 1 cm mass involving the left testicular artery, vein and vas deferens near the internal inguinal ring was resected. The artery and vein were spared, but the vas deferens was resected.

Nine months later, the patient was referred to our clinic for a moderate sized left hydrocele. Scrotal and inguinal exam revealed no evidence of hernias or masses. However, his CEA was elevated at 6.5 ng/ml (normal < 5.0 ng/ml), and a PET CT scan demonstrated new right

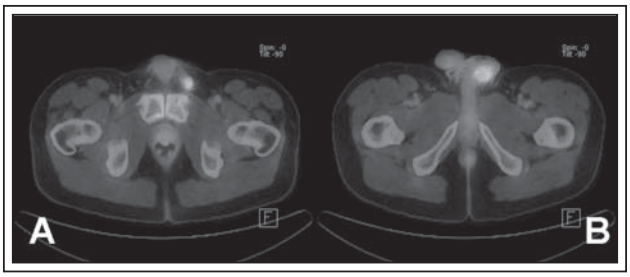

Figure 1. Positron emission computerized tomography scan of the chest, abdomen and pelvis in a patient with a history of colorectal adenocarcinoma revealing multiple foci of increased FDG uptake along the left inguinal canal (A), and testis (B), concerning for malignant recurrence.

upper and left lower lobe lung nodules with moderate FDG uptake. The patient underwent a left video assisted thoracoscopic left lower lobe wedge resection and a left hydrocelectomy. The hydrocelectomy was performed transscrotally, and while cord thickening and inflammation were noted intraoperatively, no palpable lesions suggestive of recurrent tumor were noted and there was no evidence of a patent processus vaginalis. Pathological examination of the hydrocele sac demonstrated benign tissue with no evidence of malignancy.

Five months later, a repeat PET CT scan revealed multiple foci of increased FDG uptake in the mesentery and sigmoid colon as well as a recurrence in the left inguinal canal and hemiscrotum, Figure 1a and 1b. The patient returned to the operating room for repeat surgical debulking including a segmental colectomy, and repeat hyperthermic intraperitoneal mitomycin chemotherapy. Frozen section obtained from a palpable mass encasing the spermatic cord on inguinal exploration revealed metastatic moderately differentiated adenocarcinoma. A left radical orchiectomy with high ligation of the spermatic cord was performed. Final pathology of the radical orchiectomy specimen confirmed metastatic moderately differentiated adenocarcinoma involving the testicular parenchyma, epididymis, and spermatic cord with negative margins. No adjuvant treatment was given. Six months after his most recent procedure, he remains asymptomatic and without evidence of recurrence.

Discussion

Peritoneal carcinomatosis of colorectal origin is a major cause of treatment failure in the management of colorectal carcinoma, and is the second most frequent cause of death in colorectal cancer.[1] Previously treated with systemic chemotherapy, recent reports suggest that cytoreductive surgery combined with intraoperative intraperitoneal chemotherapy is associated with improved survival.[2,3] As IPHC protocols for metastatic colorectal carcinoma evolve in clinical trials, a new spectrum of presentations of recurrence provide diagnostic and management challenges.

Most recurrent colon adenocarcinomas develop in an intraperitoneal location following debulking and IPHC, but up to 70% of patients with colorectal cancer may develop distant extraperitoneal metastases.[4] Recurrence within the inguinal canal following intraperitoneal chemotherapy represents an infrequently described site of locally recurrent colorectal adenocarcinoma.[5,6] An inguinal canal or intrascrotal recurrence may be diagnosed by palpable mass on physical exam or on surveillance imaging.[7]

The inguinal canal arises from the peritoneal cavity and contains the spermatic cord in males and the round ligament in females respectively. During development, the testis descends from the abdomen into the scrotum and carries with it the processus vaginalis. Normally, the processus is obliterated from the internal inguinal ring to the upper scrotum, but persistence of the processus vaginalis may allow peritoneal fluid to freely communicate with the scrotum. In the presence of a communicating hydrocele and patent processus vaginalis, free tumor cells migrating from the abdomen may accumulate in the inguinal canal and scrotum. Under these circumstances, it is possible that the inguinal canal can act as a sanctuary site, minimizing exposure and treatment from intraperitoneal chemotherapy.[5]

In the present case there were multiple factors that may have contributed to the inguinal recurrence. During his initial debulking, the extensive dissection of the testicular vessels and vas deferens performed due to the recurrence at the internal inguinal ring may have created a communication between the inguinal canal and peritoneum and predisposed the patient to hydrocele formation and inguinal tumor seeding. However, at the time of hydrocelectomy, abdominal surveillance imaging was negative, and hydrocele pathology was negative. The transscrotal hydrocele repair did not disrupt or violate the inguinal canal, and it is unlikely the hydrocele repair contributed to the development of inguinal metastatic disease. However, a pre-existing communication between the peritoneum and inguinal canal may have provided an outlet for tumor cells to accumulate and escape IPHC therapy.

The differential diagnosis of spermatic cord masses includes varicoceles, inguinal hernias, cysts of the

epididymis or spermatic cord, primary or metastatic tumors, adrenal rests, hematoma, and free floating calcifications within the tunica vaginalis. Tumors of the spermatic cord are uncommon, and while most are of mesenchymal origin, a majority of epithelial tumors of the spermatic cord are metastases and require a search for the primary source of malignancy.[8] In the evaluation of spermatic cord masses, the urologist must maintain a broad differential diagnosis; new clinical presentations of disease must first be described to improve follow-up, recognition, and further management. In patients with known history of peritoneal carcinomatosis who have undergone treatment with IPHC, malignant recurrence should be included in the differential diagnosis for patients that present with a new inguinal or scrotal mass. □

References

1. Jayne DG, Fook S, Loi C et al. Peritoneal carcinomatosis from colorectal cancer. *Br J Surg* 2002;89:1545.
2. Moran BJ, Meade B, Murphy E. Hyperthermic intraperitoneal chemotherapy and cytoreductive surgery for peritoneal carcinomatosis of colorectal origin: a novel treatment strategy with promising results in selected patients. *Colorectal Dis* 2006;8:544.
3. Yan TD, Black D, Savady R et al. Systematic review on the efficacy of cytoreductive surgery combined with perioperative intraperitoneal chemotherapy for peritoneal carcinomatosis from colorectal carcinoma. *J Clin Oncol* 2006;24:4011.
4. Chok KS, Law WL. Prognostic factors affecting survival and recurrence of patients with pT1 and pT2 colorectal cancer. *World J Surg* 2007;31:1485.
5. Liberale G., Elias D, Sideris L et al. Inguinal canal as an anatomic sanctuary site of relapse in peritoneal carcinomatosis previously treated with intraperitoneal chemotherapy. *J Surg Oncol* 2005;91:73.
6. Ouellette JR, Harboe-Schmidt JE, Luthringer D et al. Colorectal cancer metastasis presenting as a testicular mass: case report and review of the literature. *Am Surg* 2007;73:79.
7. James PP, Mead GM. Sanctuary site relapse in chemotherapy-treated testicular cancer. *Ann Oncol* 1992;3:41.
8. Richie JP, Steele GS. Neoplasms of the Testis. In: Campbells-Walsh Urology, 9 ed. Edited by A. J. Wein, L. R. Kavoussi, A. C. Novick et al. Philadelphia: Elsevier, Inc., vol. 1, pp. 931-934, 2007.