Human Pathology (2007) **38**, 1836–1841

ELSEVIER

Human PATHOLOGY

www.elsevier.com/locate/humpath

Original contribution

Colorectal adenocarcinoma involving the prostate: report of 9 cases

Adeboye O. Osunkoya MD[a], George J. Netto MD[a], Jonathan I. Epstein MD[a,b,c,*]

[a]*Department of Pathology, The Johns Hopkins Hospital, Baltimore, MD 21231, USA*
[b]*Department of Urology, The Johns Hopkins Hospital, Baltimore, MD 21231, USA*
[c]*Department of Oncology, The Johns Hopkins Hospital, Baltimore, MD 21231, USA*

Received 4 April 2007; revised 26 April 2007; accepted 27 April 2007

Keywords:
Colonic cancer;
Colorectal adenocarcinoma;
Prostatic involvement;
Desmoplastic stroma

Summary We present 9 consult cases, the largest series to date, of colorectal adenocarcinoma involving the prostate. Mean age of patients at diagnosis was 61 years (range, 42-78 years). Six cases were initially diagnosed on needle biopsy and the others by transurethral resection. Three cases were diagnosed before biopsy of the colon, which led to the discovery of a primary colonic tumor. The mean interval between the detection of the primary colonic tumor and prostatic involvement in the other 6 cases was 30 months (range, 1-52 months). At diagnosis, the stages of colorectal carcinomas were pT1 (n = 2), pT2 (n = 2), pT3 (n = 2), and pT4 (n = 3). Two cases involved the prostate after the recurrence of rectal adenocarcinoma at the anastomotic site of the previous colonic resection. In most cases, the tumors were typical moderately differentiated with occasional poorly differentiated foci. Other histologic features included desmoplastic stromal reaction (100%, n = 9), necrosis (77.8%, n = 7), chronic inflammatory response (77.8%, n = 7), cribriform pattern (66.7%, n = 6), villous architecture (22.2%, n = 2), mucin production (22.2%, n = 2), signet-ring cells (11.1%, n = 1), and perineural invasion (11.1%, n = 1). Immunohistochemical stains were positive for β-catenin in 6 of 6 cases, CDX2 in 6 of 6 cases, carcinoembryonic antigen in 7 of 7 cases, CK20 in 5 of 6 cases, high-molecular-weight cytokeratin in 5 of 6 cases, and α-methylacyl-CoA racemase in 3 of 6 cases. Stains were negative in all cases for prostate-specific antigen, P501S (prostein), and CK7. Six patients (66.7%) died of disease within an average of 34 months (range, 8-88 months) after diagnosis of prostatic involvement. There are critical therapeutic and prognostic implications for distinguishing between prostatic adenocarcinoma and colorectal carcinoma involving the prostate. Colorectal adenocarcinoma should be considered on prostate sampling when carcinoma exhibits either "dirty" necrosis, tall columnar epithelium with mucin production, mucin-positive signet-ring cells, villous architecture, or associated inflammation. Immunohistochemical stains for β-catenin, CDX2, carcinoembryonic antigen, high-molecular-weight cytokeratin, prostate-specific antigen, P501S (prostein), CK20, and CK7 can be helpful in making a definitive diagnosis.

1. Introduction

Distant metastases to the prostate from carcinomas arising in noncontiguous organs are exceptionally rare in clinical specimens and typically only noted with

* Corresponding author. Department of Pathology, The Johns Hopkins Hospital, Baltimore, MD 21231, USA.
E-mail address: jepstein@jhmi.edu (J. I. Epstein).

0046-8177/$ – see front matter © 2007 Published by Elsevier Inc.
doi:10.1016/j.humpath.2007.04.021

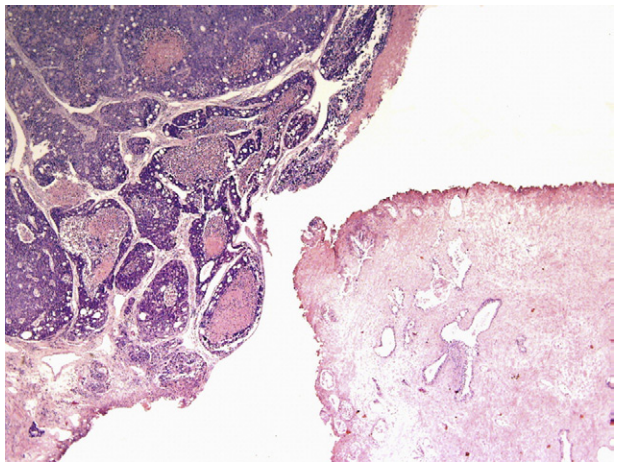

Fig. 1 Transurethral resection with invasive colorectal adenocarcinoma and adjacent benign prostatic glands.

disseminated disease at autopsy [1]. As would be expected given their contiguous anatomy, the bladder is the most common source of carcinoma to secondarily involve the prostate [1]. Despite the proximity of the colorectum to the prostate, involvement of the prostate from this site in clinical specimens is rare with only a very few case reports in the literature [2-6]. We report herein 9 cases, the largest series to date, of colorectal adenocarcinoma with metastasis or direct extension to the prostate. In addition to morphological and immunohistochemical analyses, the clinical features and long-term follow-up are presented.

2. Materials and methods

A search through the consult cases of one of the authors (J. I. E.) from 1986 to 2006 revealed 9 cases of colorectal adenocarcinoma with metastasis or direct extension to the prostate. Slides and tissue blocks were retrieved. Follow-up information was obtained on all patients from their clinicians, who variably represented urologists, gastroenterologists, gastric surgeons, or oncologists.

All cases (n = 9) were investigated immunohistochemically for prostate-specific antigen (PSA) and cases in which tissue blocks or unstained slides were available (n = 6) also for carcinoembryonic antigen (CEA), CK7, CK20, CDX2, β-catenin, high-molecular-weight cytokeratin (HMWCK), Prostene (P501S; Dako, Carpinteria, CA), and α-methylacyl-CoA racemase (AMACR). A seventh case was labeled with CEA at an outside institution. Immunohistochemical labeling was performed for PSA (polyclonal, predilute; Ventana, Tucson, AZ), CK7 (OV-TL 12/30, predilute; Dako), CK20 (Ks20.8, predilute; Ventana), CEA-p (polyclonal, predilute, CB; Dako), HMWCK (CK903/34betaE12, predilute; Ventana), AMACR (P504S, 1:1000, CB; Zeta, Sierra Madres, CA), CDX2 (CDX2-88, 1:100, CB; Biogenex, San Ramon, CA), Prostene (P501S, monoclonal mouse, clone 10E3, dilution 1:100), and β-catenin (monoclonal mouse, clone 14, dilution 1:1000; Transduction Laboratories, Lexington, KY). Four-micrometer sections were prepared from formalin-fixed, paraffin-embedded tissue samples. Immunohistochemical labeling was performed on the Ventana BenchMark XT automated stainer using the avidin-biotin method, with the exception of β-catenin labeling that was performed using the automated BioTek-Tech Mate 1000 Staining System (Ventana). All immunohistochemical assays were carried out after steam-mediated antigen retrieval. Appropriate positive and negative controls were performed.

3. Results

3.1. Clinical presentation

The mean age of patients at diagnosis was 61 years (range, 42-78 years). Six cases (66.7%) were initially diagnosed on needle biopsy and the others by transurethral resection (Figs. 1 and 2).

Six cases had a history of colorectal adenocarcinoma treated by segmental resection (n = 3), abdomino-perineal resection (n = 1), segmental resection with radiation and chemotherapy (n = 1), and pelvic exenteration (n = 1). The mean interval between the detection of the primary tumor and prostatic involvement in these 6 cases was 30 months (range, 1-52 months). The stages of the 6 colorectal carcinomas were pT1 (n = 2), pT2 (n = 2), and pT3 (n = 2). Cases 1 and 4 (22.2%) involved the prostate after the recurrence of rectal adenocarcinoma at the anastomotic site of the previous colonic resection. In the remaining 3 cases (33.3%), prostatic involvement by colorectal carcinoma was diagnosed before diagnosis of the colorectal carcinoma, which led to the discovery of the stage IV colorectal primary tumor (cases 7-9). There

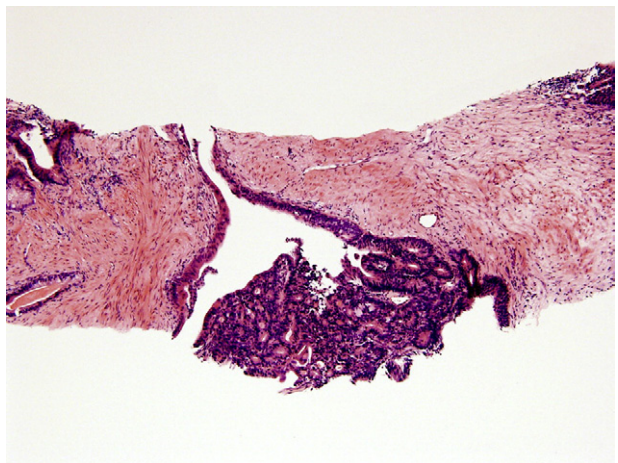

Fig. 2 Prostate needle biopsy with moderately differentiated colorectal adenocarcinoma with cribriform pattern.