Case Report

Metastatic prostate cancer to an ischiorectal fossa lymph node identified on multiparametric magnetic resonance imaging

Andrew M. Fang[1], Samuel J. Galgano[2], Jennifer B. Gordetsky[3], Sunil Sudarshan[1], Andrew M. McDonald[4], Soroush Rais-Bahrami[1,2]

Departments of [1]Urology, [2]Radiology, [3]Pathology and [4]Radiation Oncology, University of Alabama at Birmingham, Birmingham, Alabama, USA

Abstract

Prostate cancer is the most common noncutaneous malignancy in American men. Its lymphatic drainage is very well established throughout literature. We report the case of a 72-year-old Caucasian male with elevated serum prostate-specific antigen and biopsy-confirmed high-risk prostate cancer who underwent multiparametric magnetic resonance imaging (MRI) for staging and treatment planning. The imaging revealed suspicious lymph nodes in the left ischiorectal and right obturator fossae that were biopsy confirmed as metastatic prostate adenocarcinoma. Herein, we present the divergence from the well-established lymphatic drainage of prostate cancer and the role of MRI in detecting this prostate cancer site of spread.

Keywords: Cancer staging, ischiorectal fossa, lymphatic spread, multiparametric magnetic resonance imaging, prostate cancer

Address for correspondence: Dr. Soroush Rais-Bahrami, Department of Urology, University of Alabama at Birmingham, Faculty Office Tower 1107, 510 20th Street South, Birmingham, Alabama 35294, USA.
E-mail: sraisbahrami@uabmc.edu

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INTRODUCTION

The metastatic spread of prostate cancer to lymph nodes is universally considered one of the most adverse prognostic indicators in patients with biopsy-proven prostate cancer and is responsible for upstaging of disease.[1] Therefore, the lymphatic drainage and patterns of spread for prostate cancer have been widely described in literature, as the disease generally disseminates to the regional pelvic lymph nodes first. This initial template of potential spread includes pelvic lymph nodes in the obturator fossa, along the external and internal iliac vessels, and in the space anterior to the sacrum. From these typical initial landing sites, prostate cancer can further spread along the lymph nodes around the common iliac vessels cranially to the retroperitoneal nodal regions including the para-aortic, paracaval, and interaortocaval lymph nodes.[2,3]

Pelvic imaging has been widely used for clinical staging in patients diagnosed with high-volume, intermediate or high-risk prostate cancer, or those who harbor a higher probability of nodal involvement. Over the last few years, advances in multiparametric-magnetic resonance imaging (mp-MRI) have made this imaging modality a critical tool in clinical staging for these patients along with planning treatment decisions. mp-MRI has not only allowed for the identification of suspicious lesions in the prostate but has also demonstrated an equivalent ability to accurately stage pelvic lymph nodes as compared to

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computed tomography (CT).[4-6] Herein, we present a case of prostate cancer with metastatic spread to lymph nodes identified by mp-MRI including a biopsy-proven lymph node outside the established lymphatic drainage pattern. To date, the identification of a prostate cancer-positive lymph node in the ischiorectal fossa by mp-MRI has not been reported.

CASE REPORT

A 72-year-old Caucasian male with a history of prostatitis presented for the evaluation of his recently elevated serum prostate-specific antigen (PSA). Over the past 10 years, his PSA values have ranged from 1 to 3 ng/ml. However, his last two annual PSA screening levels had risen from 3.72 to 8.17 ng/ml. PSA value on the day of presentation was found to have again risen to 10.89 ng/ml. He endorsed that he has a history of mild intermittent left groin and left scrotal pain for over a year. On digital rectal examination, his prostate was estimated at 60 g, without any nodularity or asymmetry.

For his persistently rising PSA values, he subsequently underwent transrectal ultrasound biopsy of his prostate. After the biopsy, he developed pelvic pain, tenesmus, and hematuria that were successfully managed with oral antibiotics. The biopsy pathology revealed prostate cancer in 3 out of 12 cores. Two cores showed small foci of prostatic adenocarcinoma, with Gleason score 3+3 = 6 (Grade Group 1) [Figure 1a and b]. One core had Gleason score 4+4 = 8 (Grade Group 4) prostatic adenocarcinoma with cribriform morphology involving <1% of one core [Figure 1c and d]. For staging and treatment planning, he underwent mp-MRI of the prostate.

MRI of his prostate revealed two intraprostatic lesions assigned Prostate Imaging Reporting and Data System version 2 score of 4. In addition, there were two areas of suspected malignant lymphadenopathy. The first was an enlarged 1.8-cm right obturator fossa with restricted diffusion and hypervascularity on dynamic contrast-enhanced imaging [Figure 2]. The second was an enlarged 1.6-cm lymph node in the left ischiorectal fossa with hypointensity on T2-weighted imaging, hypervascularity on dynamic contrast-enhanced imaging, and very low apparent diffusion coefficient with correlative high intensity on b-2000 diffusion-weighted imaging [Figure 3].

After discussion with the patient, he elected to partake in a clinical trial that required him to undergo an additional MRI of his pelvis. The imaging again noted similar lesions as the previous MRI, but also an enlarged 0.7-cm right common iliac node. Due to concern that his lymphadenopathy could be the result of a metastatic process, a colonoscopy and a CT-guided biopsy of his ischiorectal fossa lymph node were obtained [Figure 4]. While the colonoscopy did not demonstrate any signs of malignancy, the CT-guided biopsy results revealed metastatic prostatic adenocarcinoma [Figure 5]. Consequently, the patient was referred to radiation oncology for consideration of

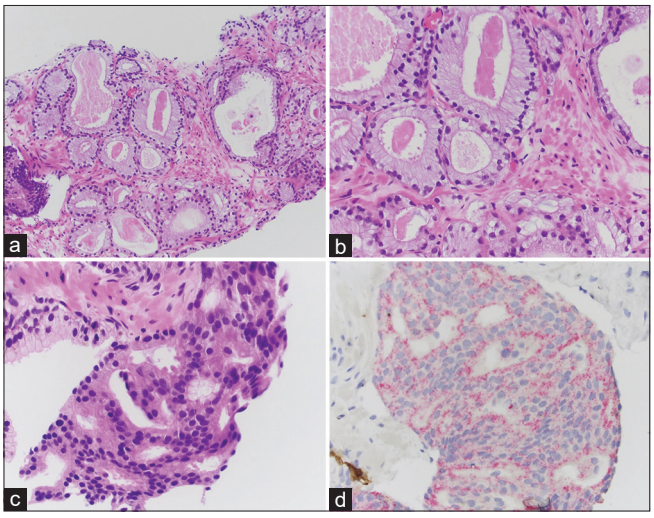

Figure 1: (a) H and E-stained slide showing prostatic adenocarcinoma, Gleason score 3+3 = 6; (b) H and E-stained slide at high magnification showing cancerous glands with amphophilic cytoplasm, straight luminal borders, dense secretions, and prominent nucleoli; (c) A small focus of high-grade prostatic adenocarcinoma, Gleason score 4+4 = 8, with cribriform pattern; (d) PIN4 immunohistochemical stain demonstrated loss of basal cells and p504S positivity

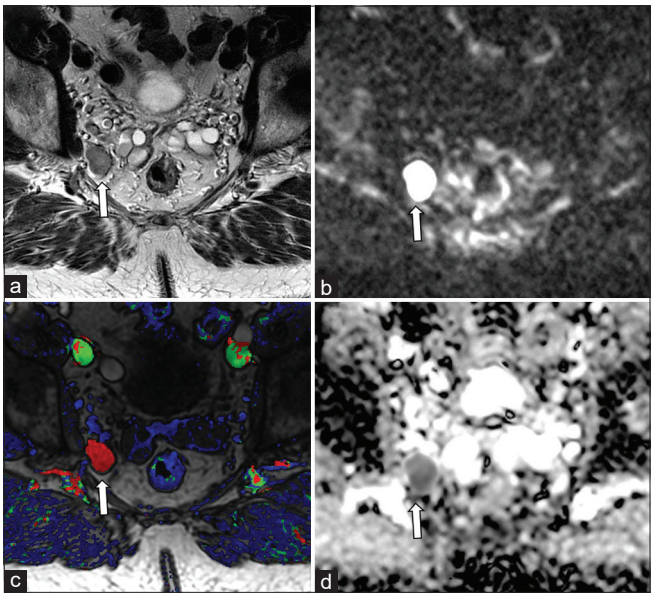

Figure 2: Multiparametric prostate magnetic resonance imaging demonstrating an enlarged right obturator lymph node (a – axial T2) with associated intense restricted diffusion on b2000 diffusion-weighted imaging (b), increased perfusion on dynamic contrast-enhanced perfusion map (c), and restricted apparent diffusion coefficient (d)

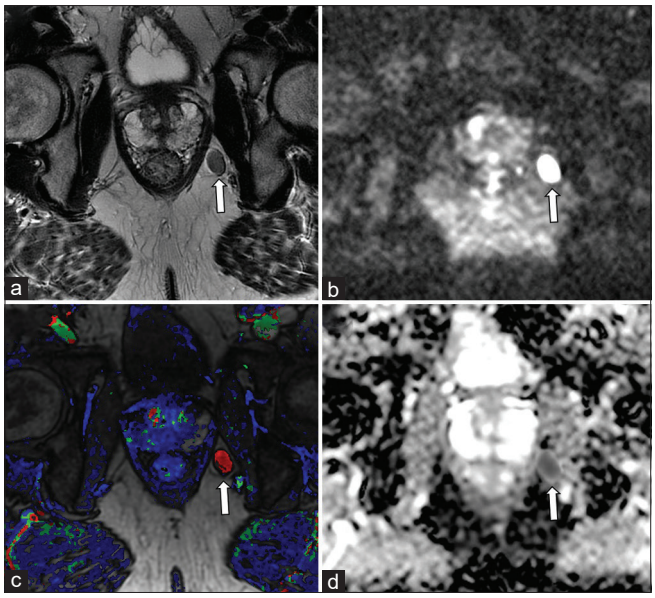

Figure 3: Multiparametric prostate magnetic resonance imaging demonstrating an enlarged left ischiorectal fossa lymph node (a – axial T2) with associated intense restricted diffusion on b2000 diffusion-weighted imaging (b), increased perfusion on dynamic contrast-enhanced perfusion map (c), and restricted apparent diffusion coefficient (d)

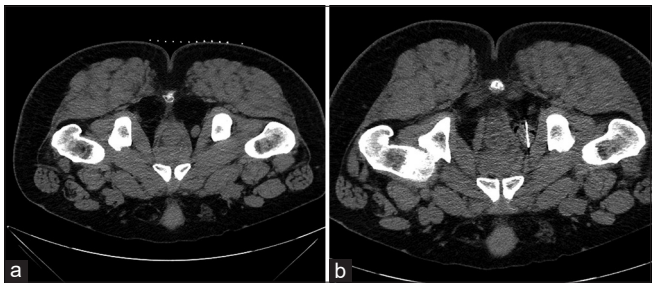

Figure 4: Computed tomography-guided localization of the left ischiorectal fossa lymph node (a) and subsequent computed tomography-guided transgluteal biopsy of the lymph node (b)

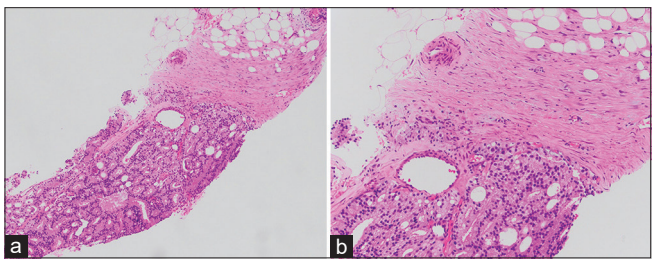

Figure 5: (a) H and E-stained slides showing metastatic prostatic adenocarcinoma with cribriform morphology, (b) Adjacent fat can be seen next to the invasive tumor

radiotherapy and concurrent androgen deprivation therapy for regionally advanced, oligometastatic prostate cancer.

DISCUSSION

Properly ascertaining the chance of lymph node metastasis and detection of occult lymph node metastases is crucial for treatment planning for patients with newly diagnosed prostate cancer. The gold standard of nodal staging is pelvic lymph node dissection; however, the procedure is invasive and associated with increased risk of morbidity and complications.[7] Cross-sectional imaging is widely utilized as a noninvasive measure to determine nodal staging in patients with intermediate-to-high-risk prostate cancer. However, it relies largely on the dimensional and morphological characteristics of the lymph nodes to determine the probability of metastatic involvement.[8] A meta-analysis demonstrated that both CT and MRI as anatomic imaging modalities had similar sensitivities of 42% and 39%, respectively, and specificities of 82% and 82%, respectively.[9]

While CT and MRI lack the ideal sensitivities for screening for lymph node metastasis, mp-MRI has shown promise in better predicting nodal metastasis incorporating functional imaging parameters including diffusion-weighted imaging and dynamic contrast enhancement. Brembilla *et al*. examined 101 patients who underwent both preoperative mp-MRI and extended pelvic lymph node dissection. Morphologic characteristics of lymph nodes continued to demonstrate low sensitivity in their cohort; however, mp-MRI determinations of tumor volume and stage were more accurate predictors of nodal invasion (area under curve = 0.93 and 0.84, respectively).[6]

While the common routes of lymphatic spread of prostate cancer have been well established, the spread of prostate cancer to the lymph nodes around the rectum and in the ischiorectal region is not considered a routine venue of lymphatic spread for prostate cancer. Nevertheless, there have been a few documented cases of prostate cancer found in perirectal tissues after low anterior resection or abdominoperineal resections for rectal cancer. However, the exact location of these lymph nodes along the mesorectum has not been reported.[10-15] Although it has been postulated that there may be lymphatic drainage connection from the pararectal regions to the internal and external iliac regions, no definitive studies have provided any evidence of this lymphatic drainage pathway.[3]

To date, there have been no reports in the literature of metastatic spread of prostate cancer to lymph nodes below the dentate line and into the ischiorectal fossa. As this lymphatic spread is outside the established primary landing zones of prostate cancer and outside the template for extended pelvic lymph node dissection, the prevalence of metastatic spread of prostate cancer in this region would likely be underestimated. With the advent of mp-MRI for staging and treatment planning of prostate cancer,

further investigation with large patient series would be needed to fully determine the prevalence and management of metastatic prostate cancer into the perirectal and ischiorectal fossa lymph nodes.

CONCLUSION

The evidence for the use of mp-MRI for treatment planning and clinical staging of prostate cancer has been rising. Our findings demonstrate a case of mp-MRI to identify metastatic lymph nodes including one outside the normal drainage pattern for prostate cancer and boundaries of the extended pelvic lymph node dissection.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

Soroush Rais-Bahrami serves as a consultant for Philips/InVivo Corp, Blue Earth Diagnostics, and Genomic Health Inc.

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