

## Metastatic prostate cancer with malignant ascites: A case report and literature review

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Cite as: *Can Urol Assoc J* 2013;7:E248-50. <http://dx.doi.org/10.5489/cuaj.547>

### Abstract

Malignant ascites from advanced prostate cancer is rare and has a poor prognosis. We report a case of a 57-year-old African American male presenting with weight loss, lower urinary tract symptoms and voiding dysfunction. He also had renal failure with metabolic abnormalities associated with significant abdominal distention and pain. Computed tomography showed ascites, which was pathologically confirmed by immunostaining and cytological identification of malignant cells. Prostate biopsy identified high-grade prostate cancer which responded to hormonal therapy with a significant decrease in serum prostatic-specific antigen. Ascites was managed with paracentesis and renal failure with hemodialysis as needed.

### Introduction

Prostate cancer is the most common cancer in men and the second leading cause of death in men in the United States.<sup>1</sup> It is estimated that about 240 890 new diagnoses and 33 720 deaths will result from prostate cancer in 2011.<sup>1</sup> It affects African American men (at an incidence rate of 234 cases per 100 000 men) more than Caucasian men (150 cases per 100 000 men). Most cases present with localized disease and have good prognosis. However, advanced metastatic prostate cancer commonly metastasizes to regional lymph nodes and vertebral bones, but metastasis to the peritoneum leading to malignant ascites is rare. There are only 15 published cases (Table 1).<sup>2-15</sup> We report a case of malignant ascites from advanced metastatic prostate cancer with high volume disease in an African American male.

### Case report

A 57-year-old African American male was admitted with fatigue, a 30-lb unintentional weight loss over 6 months, lower urinary symptoms, bilateral lower extremity edema

and no gross neurological deficit. Initial potassium was 7.5 meq/L and blood urea nitrogen (BUN)-to-creatinine ratio of 46:26 mg/dL. A computed tomography (CT) of the abdomen and pelvis without contrast showed massive abdominal ascites, moderate bilateral hydronephrosis, right external iliac lymphadenopathy and enlarged prostate. Malignancy workup was negative except for a prostate-specific antigen (PSA) of 330 ng/mL. He subsequently underwent transrectal ultrasound guided prostate biopsy, which demonstrated Gleason score 5+4=9 in 80% of the biopsy bilaterally (Fig. 1). A bone scan showed osseous metastatic bone lesions in the T7 vertebral body, left fourth rib posteriorly and right proximal humerus. Therapeutic and diagnostic paracentesis was performed. A hazy yellow fluid was sent for analysis. The ascites fluid demonstrated malignant cells that immunostained with cytokeratin AE1/AE3, CAM 5.2, CK7, and prostatic acid phosphatase (PRAP) (Fig. 2). Ascites fluid creatinine was consistent with serum.

Bicalutamide, an antiandrogen, was used for androgen blockade for 2 weeks and initiated 7 days prior to starting a luteinizing hormone-releasing hormone (LHRH) agonist, to prevent testosterone flare associated with LHRH agonist therapy.

He was dialyzed for hyperkalemia and uremia and bilateral percutaneous nephrostomy tubes were placed for the obstructive uropathy. His creatinine and BUN ratio improved to 8.51:31 mg/dL and his potassium normalized. He was discharged for follow-up with nephrology.

On follow-up, androgen deprivation therapy with LHRH agonist resulted in a PSA decrease from over 300 to 40 ng/mL within 3 months. However, he remained symptomatic from the ascites with multiple hospital admissions for abdominal pain, nausea and vomiting, necessitating therapeutic paracentesis.

### Discussion

The PSA era has led to a stage and grade migration of prostate cancer with 60% to 75% of newly diagnosed prostate

**Table 1. Case reports of malignant ascites from prostate cancer**

| Author                         | Age | Isolated ascites | Treatment           |
|--------------------------------|-----|------------------|---------------------|
| Biegel et al. <sup>2</sup>     | 29  | No               | None                |
| Rapoport et al. <sup>3</sup>   | 45  | No               | Orchiectomy         |
| Megalli et al. <sup>4</sup>    | 58  | Yes              | Diethylstilbestrol  |
| Appalaneni et al. <sup>5</sup> | 60  | No               | None                |
| Catton et al. <sup>6</sup>     | 63  | No               | None                |
| Benedict et al. <sup>7</sup>   | 67  | Yes              | Docetaxel + steroid |
| Tsai et al. <sup>8</sup>       | 68  | No               | Interferone         |
| Saif et al. <sup>9</sup>       | 70  | Yes              | Thalidomide         |
| Maddan et al. <sup>10</sup>    | 75  | No               | Diethylstilbestrol  |
| Kehinde et al. <sup>11</sup>   | 76  | No               | Orchiectomy         |
| Rapoport et al. <sup>3</sup>   | 76  | No               | 5-FU + IP thiotepa  |
| Disdier et al. <sup>12</sup>   | 78  | No               | Nilutamide          |
| Lapoile et al. <sup>13</sup>   | 80  | No               | None                |
| Amin et al. <sup>14</sup>      | 83  | No               | Hormonal withdrawal |
| Zagouri et al. <sup>15</sup>   | 75  | Yes              | Docetaxel           |

FU: fluorouracil; IP: intraperitoneal.

cancer presenting with low-stage disease (T1c).<sup>16-19</sup> Most cases presenting with malignant ascites are associated with other metastatic sites, including bone, lymph nodes, omentum, rectal wall, liver, adrenal and pleural effusions.<sup>20</sup> Physicians should be aware of the rare manifestation of advanced prostate cancer with ascites and the diagnostic tools to confirm the diagnosis. Ascites fluid can be character-

ized using various immunostains (Fig. 2). This is particularly helpful in cases of high-grade, poorly differentiated prostate cancers that do not stain for PSA.

Therapy focuses on supportive care with paracentesis to alleviate abdominal pain and respiratory distress. Oncologically, treatment focuses on palliation with endocrine therapies (medical or surgical) and palliative chemotherapy. These therapies may add additional months to the life of patients; however, prognosis is poor with most dying in weeks to months.

## Conclusion

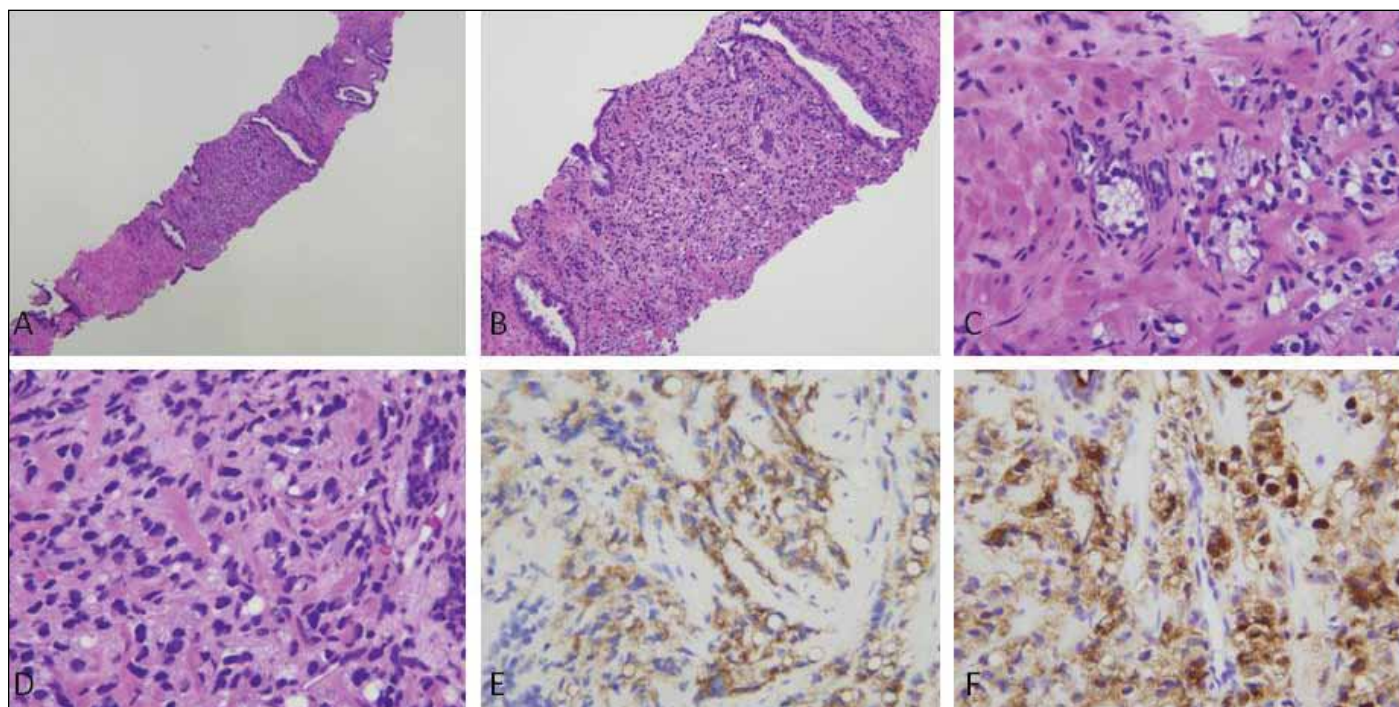
Malignant ascites in prostate cancer is a poor prognostic sign. Clinicians should be aware that supportive and palliative care is currently the mainstay of treatment.

**Competing interests:** None declared.

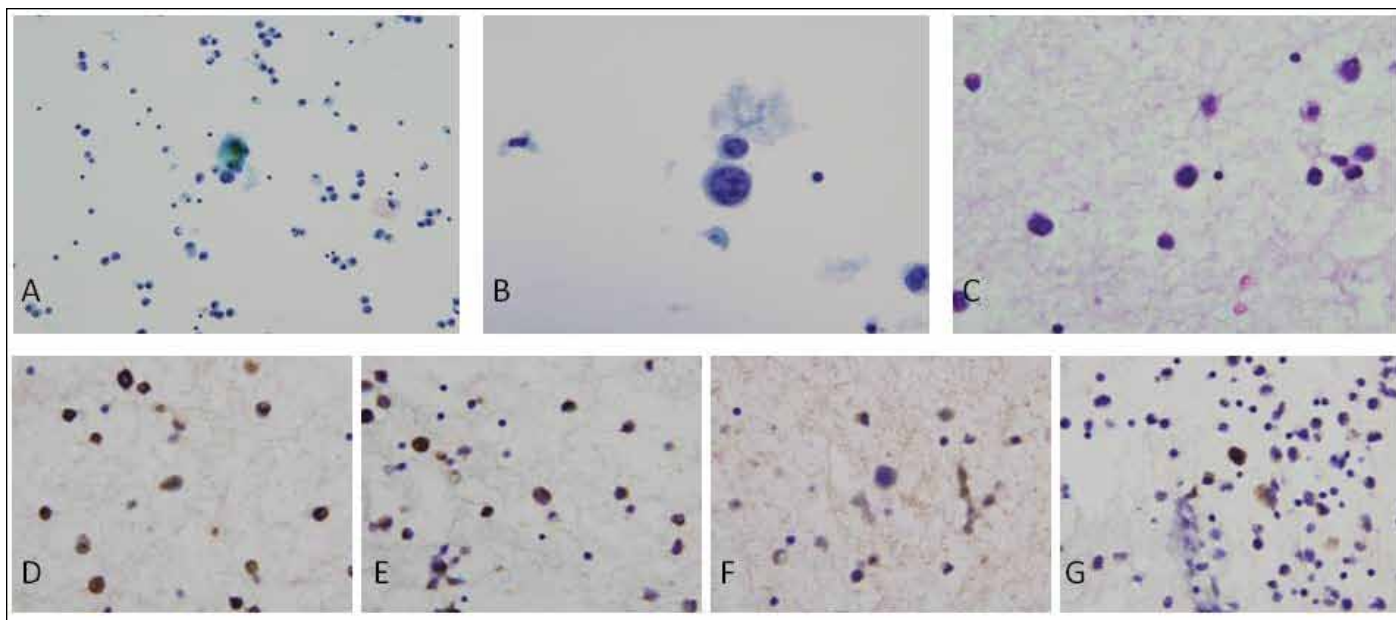
This paper has been peer-reviewed.

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**Fig. 1. A:** Needle core biopsy of the prostate with 80% involvement by prostatic adenocarcinoma, Gleason 5+4=9. **B:** Medium power view of the prostatic adenocarcinoma. **C:** Adenocarcinoma of the prostate, Gleason pattern 4. **D:** Adenocarcinoma of the prostate, Gleason pattern 5. **E:** Prostate-specific antigen immunostaining of prostatic adenocarcinoma cells. **F:** Prostatic acid phosphatase immunostaining of prostatic adenocarcinoma cells.



**Fig. 2.** Malignant ascites in a 57-year-old male with prostate adenocarcinoma. **A:** Low power overview of individual malignant cells and mesothelial cells in ascetic fluid (ThinPrep). **B:** Malignant cells derived from prostate adenocarcinoma demonstrating large nuclei with multiple nucleoli (ThinPrep). **C:** Malignant cells (Cell Block). Prostate adenocarcinoma cells highlighted in a cell block preparation by immunostaining for: **D:** AE1/AE3; **E:** CAM5.2; **F:** CK7; **G:** Prostatic acid phosphatase.

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