



Oncology

Isolated Hepatic Metastasis from Prostate Carcinoma

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ABSTRACT

Worldwide, prostate cancer is considered the second most common cancer in men. Most common sites for metastatic disease are lymph nodes and bones. However, isolated liver metastasis from prostate cancer is rare. We present a 75 year-old male with prostate adenocarcinoma diagnosed 7 years ago. With rising PSA, he underwent imaging and found to have isolated hepatic metastasis. After left hepatic lobectomy, his PSA dramatically decreased to < 0.01 . Physicians should be aware of isolated hepatic metastasis in patients with prostate cancer. Metastectomy should be considered in such case, and combined medical and surgical approach may prolong the overall survival.

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Background

Worldwide, prostate cancer (PCa) is the second most common cancer among men. In United States, American Cancer Society predicted approximately 180,890 new cases and 26,120 deaths from PCa in 2016.¹ Most common location of metastasis includes lymph node and bones. Other distant organs that may be involved are lung, liver, and brain. However, isolated liver metastasis is rare and has been reported as case reports.² The exact pathophysiology is still unclear at this time. We report a case of 73 year-old male diagnosed with prostate adenocarcinoma, follow-up imaging revealed liver mass. Though initially believed to be primary hepatic malignancy, biopsy showed metastasis from PCa. Staging PET scan showed no other metastatic disease.

Case presentation

Patient is a 75 year-old male, who was diagnosed with prostate adenocarcinoma 7 years ago, Gleason score $3 + 4 = 7$, malignancy was found in 10 out of 12 total biopsies. He was staged T3aN0M0, stage III disease. His initial treatment consisted of external beam radiation with LHRH agonist. PSA level decreased from 7.6 to 0.46, and patient remained in remission for 6 years.

He had recurrent disease with rising PSA peaking at 48, and repeat CT imaging showed an ill-defined 5.2 cm hypodensity in the left lobe of liver. Follow-up MRI liver showed a 5.3 x 5.0 cm mass in the left lateral hepatic segment with heterogeneous hypervascularity surround the periphery of the mass (Fig. 1). No other abnormalities were seen. The initial differential diagnosis included primary hepatic or possible metastatic disease from colon cancer. He underwent colonoscopy, which did not show any signs of malignancy. PET scan was performed for re-staging of his disease, and showed only a hypermetabolic left hepatic lobe abnormality consistent with tumor and no other activities. Bone scan was negative for metastasis as well. He underwent biopsy of the liver mass, and pathology showed metastatic prostate carcinoma (Fig. 2).

Due to isolated hepatic metastasis without involvement of other sites, patient underwent left hepatic lobectomy and did well overall. His post-operative PSA decreased to < 0.01 from 48 (Fig. 3). He is currently doing well with no signs of metastatic disease, and his only treatment is LHRH agonist. He is being followed with CT of abdomen for hepatic metastasis, along with routine visit and PSA level monitoring.

Conclusion

Typical location for PCa metastasis include lymph node and bone, and less commonly to lung, liver and brain. In an autopsy study consisting of 1589 patients found to have PCa, metastatic spread were seen in 90% to bone, 46% to lung, 25% to liver, 21% to pleura, and 13% to adrenal.³ However, liver metastasis rarely occurs

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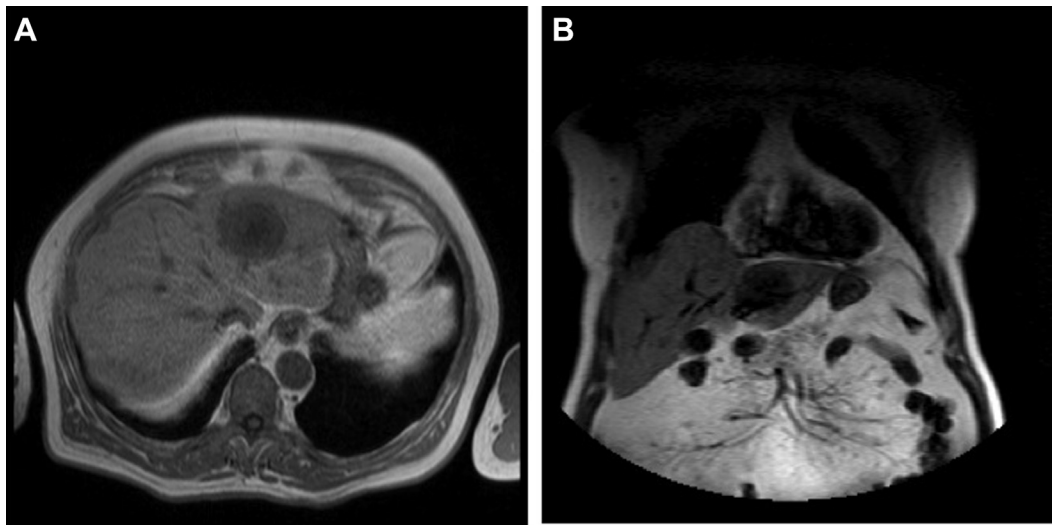


Figure 1. MRI liver protocol showing a 5.3 x 5.0 cm mass centered in the left lateral hepatic segment, not seen on previous scans. The center of this mass demonstrates even higher T2 and low T1 signal without obvious enhancement, which may reflect necrosis. There is a ring of heterogeneous hypervascularity around the periphery of this mass. (A) Axial section (B) Coronal section.

without metastatic spread to other sites. Isolated liver spread has been documented in case reports. In a study of 1367 people with metastatic PCa, isolated liver spread was only seen in 5 patients.⁴

Liver metastasis mostly represents advanced state in systemic disease and occurs in those who had prior hormone or chemotherapy. In a retrospective study on 27 patients with metastatic PCa to liver, 19 (70.4%) presented with more aggressive and hormone refractory case with prior treatment 8 patients presented with synchronous liver metastasis at time of PCa diagnosis, but 1 out of 19 patient had isolated liver metastasis in castration resistant and 1 out of 8 in castration sensitive group.⁵ Analysis of prognostic indicator found hormone resistance status to be indicative of overall poor survival. In castration sensitive PCa patient with liver metastasis, treated with androgen deprivation, the median survival was 38 month with 50% alive at latest follow-up. However, in castration resistant group, median survival was only 6 months. For this reason, liver metastases itself does not predict survival, but rather hormone sensitivity status seems to be the major determinant.

Although most cases of PCa are diagnosed in localized disease stage, some present with overt metastases. Management of metastatic PCa patients depends on castration status: resistant or sensitive. Treatment in castration sensitive patients includes androgen deprivation therapy (ADT) either through surgical or medical orchiectomy. In those with visceral multiple metastases, comparing to ADT alone, combination of ADT and docetaxel has been found to improve overall survival. However in those with castration resistant disease, novel agents are used in conjunction with ADT to improve survival. Agents such as abiraterone and enzalutamide interfere with androgenic stimulation. However, the optimal management of patients presenting with metastatic disease to one site has not been well studied. Treatment may depend on several factors such as site, patient age, other comorbidities, overall prognosis, and patient tolerability to further therapy. Radiation therapy can be used in those with bone metastasis for pain control. However, our patient underwent resection of the hepatic mass and had no evidence of other involved site. In such case, surgical resection is favored due to

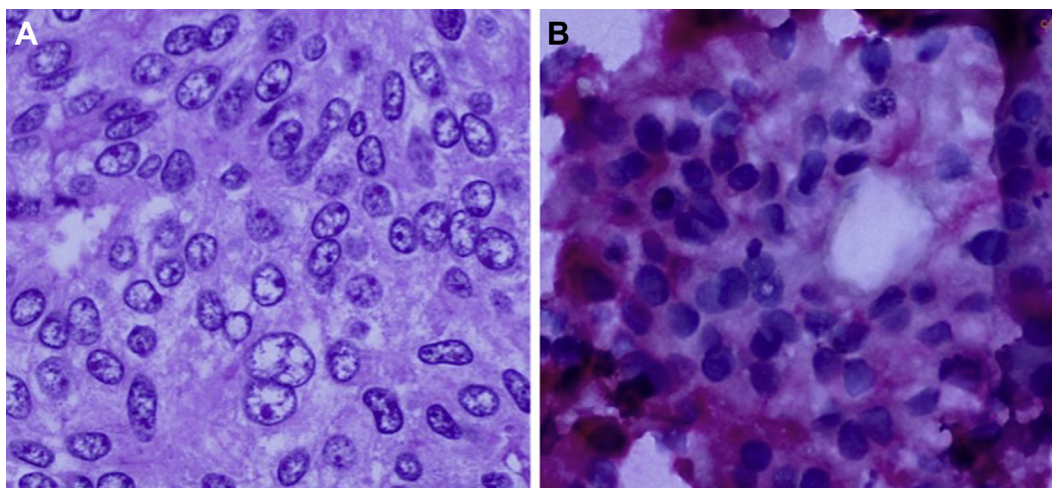


Figure 2. (A) This slide (400× total magnification) demonstrates the cytologic atypia with some larger nuclei and irregular nuclear contours. There are prominent nucleoli. (B) Immunohistochemical staining with PIN4 highlights the tumor cells with the racemase portion of the stain (red). Together with the histology, this is diagnostic of metastatic prostate adenocarcinoma.

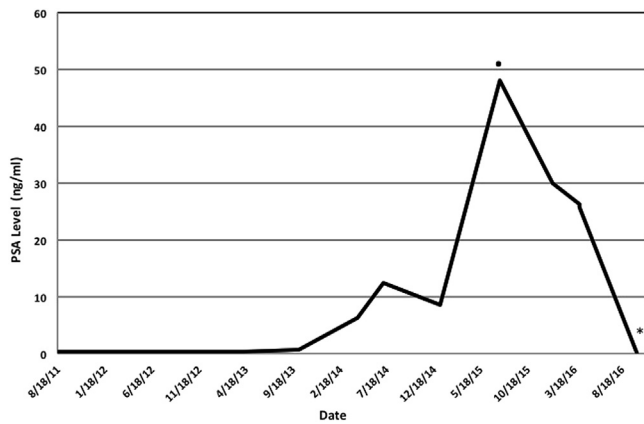


Figure 3. Demonstrates the decline in PSA level following surgical resection of isolated liver metastasis. PSA decreased from 48 (dot) to less than 0.01 (asterisk).

oligometastasis of the primary tumor. Depending on the number of lesions, location, major vascular involvement, sufficiency of hepatic reserve, metastasectomy may be considered.

We report a case of isolated liver metastasis from PCa described and found rarely in only few cases. It is uncommon for PCa to spread to liver alone. This case illustrates the importance of considering metastasis even though the organ may not be the typical site for

PCa spread. In our case, the patient underwent resection of the liver metastasis. Since he did not have any measurable disease, he was continued on the hormonal treatment with close follow-up. It is unclear whether metastasectomy of isolated liver metastasis due to PCa lead to overall survival advantage. Though difficult due to rare number of such case, a large-scale study is needed to determine the survival advantage of surgical and medical treatments in these patients, as well as risk factors predisposing PCa patients to isolated distant organ metastasis without involvement of more common metastatic sites.

Competing interests

The authors declare that they have no competing interests.

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