



# Hemoperitoneum as First Manifestation of Advanced Prostate Cancer

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## Abstract

Metastatic prostate cancer seldomly affects the liver. Moreover, hemoperitoneum is an un-common manifestation of metastatic liver cancer and it has never been reported to be caused by rupture of hepatic metastatic lesions secondary to prostate adenocarcinoma. We describe a case of advanced prostate cancer with liver metastases, presenting with hemoperitoneum, which was successfully treated. Treatment included transarterial embolization, blood transfusions and hormonal therapy. Patient responded successfully and was eventually stabilized and discharged to be followed up in an outpatient setting.

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## Introduction

Prostate cancer is the second leading cause of malignancy worldwide. The most common sites of metastases are bones and lymph nodes [1]. Liver metastases have rarely been reported and their pathogenesis remains inadequately investigated [2].

Hemoperitoneum is defined as the presence of blood in the peritoneal cavity and usually requires urgent intervention [3]. To our knowledge, hemoperitoneum caused by intraperitoneal rupture of hepatic metastases secondary to prostate cancer has never been reported in the literature. We hereby report a case of hemoperitoneum induced by liver metastases from prostate cancer.

## Case presentation

A 60-year-old Caucasian male presented to our Emergency Department with fatigue, malaise, abdominal pain and distension accompanied by a diffuse zoster-like hematoma of the lower abdomen (Figure 1). From his medical history he declared that he is a heavy smoker, he was diagnosed with moderate aortic regurgitation as well as ascending aortic aneurysm (4.1cm), hypothyroidism due to autoimmune thyroiditis and myasthenia Gravis. He was under treatment with levothyroxine for hypothyroidism and pyridostigmine as well as azathioprine for myasthenia.



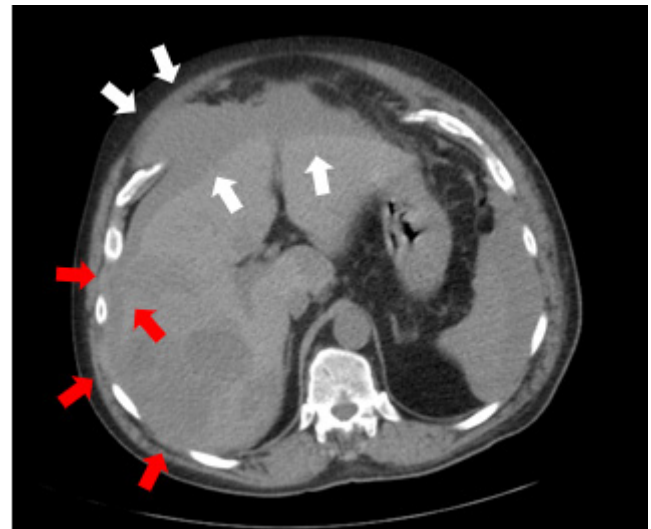
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He was previously admitted to another hospital for abdominal distension and severe anemia (Hct: 16.3%) and after multiple blood transfusions his hematocrit was raised up to 28% and he was discharged. Eventually, seven days later he presented to our department. His vital signs were unremarkable, except from elevated heart rate (108 bpm) and marginal systolic blood pressure (100 mmHg). His hemoglobin was 6.4g/dL (Hct: 18.6%), total bilirubin was 2.1mg/dL, (conjugated: 0.7mg/dL), gamma-Glutamyl Transferase (GGT): 143 U/L, Alkaline Phosphatase (ALP): 130 U/L, Lactate Dehydrogenase (LDH): 1309 U/L and Prostate Specific Antigen (PSA): 399ng/mL, whereas Aspartate (AST) and Alanine (ALT) aminotransferases were within normal values as well as all other biochemical and serological tests. CT-scan of the thorax and abdomen showed diffuse liquid in the peritoneal cavity and multiple hepatic lesions – mostly subcapsular – with a poorly distinguishable liver capsule (Figure 2), indicative of intraperitoneal rupture of the hepatic lesions, as well as multiple lung and bone metastases. Paracentesis revealed hemorrhagic fluid (fluid Hct: 40%) with no evidence of malignancy in the cytologic analysis of the fluid. Other sites of bleeding were excluded. Prostate biopsy revealed adenocarcinoma on both prostate lobes; Gleason 8 and Grade 4 on the right prostate lobe, Gleason 9 and Grade 5 on the left.

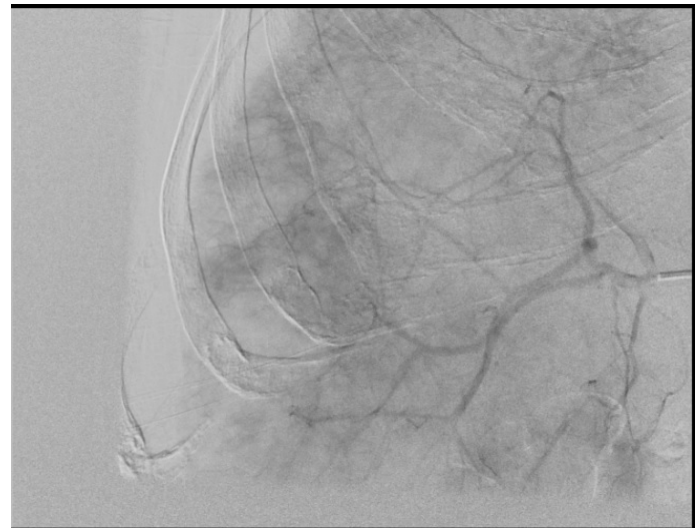
Workup revealed hemoperitoneum due to intraperitoneal rupture of liver metastasis from prostate cancer and patient immediately referred to the interventional radiology unit and angiography was performed by puncturing the common right femoral artery. Common hepatic artery angiography was performed and micro - bleeding were identified from multiple branches of the right hepatic artery. Superselective catheterization was feasible by using a 2.6Fr micro-catheter and transarterial embolization was performed with PVA 300–500  $\mu$ m (Figure 3), resulting slowly in stabilization of patients' clinical situation. He totally received 11 units of concentrated red blood cells and 6 units of fresh frozen plasma and ten days later treatment for prostate cancer with Triptorelin 3.75mg once a month im and Bicalutamide 50mg daily was initiated. After two weeks of hospitalization the patient was fully mobilized with stable hemodynamic condition, absence of ascitic fluid, hemoglobin levels of 9 g/dL and significant decline of serum PSA levels (15 ng/mL) suggesting hormone sensitivity of the prostate neoplasm.



**Figure 1:** Abdominal distention and diffuse zoster-like hematothorax of the lower abdomen.



**Figure 2:** Abdominal CT showing multiple hepatic lesions. Poorly distinguishable liver capsule (red arrows) and diffuse liquid in the peritoneal cavity (white arrows) indicated intraperitoneal rupture of hepatic metastases.



**Figure 3:** Selective angiography of the right hepatic artery depicted blushing of several tumors and microbleeding at different sites.

## Discussion

Hemoperitoneum is a potentially fatal clinical situation. It can be precipitated by trauma but non-traumatic hemoperitoneum is observed mainly in cirrhotic patients with or without concurrent hepatocellular carcinoma. Hemoperitoneum can be a life-threatening condition for cirrhotic patients who have a limited compensatory reserve during hemorrhagic shock so mortality rates up to 30% have been reported in spontaneously ruptured HCC cases [4]. Other causes of hemoperitoneum in patients with severe liver disease include rupture of ectopic/intraperitoneal varices or splenic artery aneurysms and less frequently iatrogenic maneuvers, such as liver biopsy, paracentesis or Transarterial Chemoembolization (TACE) [5]. However, unlike with HCC cases, the rupture of liver metastasis and associated hemoperitoneum is very rare in patients with solid tumors [6] and had never been reported in patients with advanced prostate cancer. Usually, those patients present with abdominal pain, as well as signs of organ failure and shock [5]. In our case, patient was admitted relatively hemodynamically stable, possi-

bly because of self-tamponade by the pressure in the distended abdomen and the fact that his coagulation studies were within normal values.

Prostate cancer metastases (mainly bones or lymph nodes) are frequently the first manifestation of the disease. However, liver metastases have been rarely reported [2] and they can lead to serious complications, such as biliary tract obstruction with jaundice [7] or portal vein thrombosis [8]. In this report we describe the first case of hemoperitoneum caused by spontaneous rupture of hepatic metastases secondary to advanced prostate cancer. Treatment can be based on both conservative methods, such as hormonal therapy and interventional methods. In our case hormonal therapy for prostate cancer following the life - saving transarterial embolization procedure resulted in patient clinical improvement as well as notable decrease in liver lesions and in impressive decline of serum PSA levels within few days, suggesting the hormone-sensitive nature of the primary cancer [9].

#### Declaration of competing interest

The authors declare that they have no competing interests. No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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