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Portal Vein Thrombosis after Diagnosis of Ovarian Cancer: A Case Report

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Abstract

Portal vein thrombosis (PVT) is a rare complication of malignancies and various liver disorders. We report 2 cases of acute portal vein thrombosis after surgical tumor debulking following a diagnosis of ovarian cancer. This is to highlight the importance of considering PVT in ovarian cancer patients presenting with abdominal pain.

Keywords: Portal vein thrombosis; Ovarian cancer

Introduction

There is strong evidence that the presence of malignancy increases the incidence rate of thrombosis. In a large population-based epidemiological study, approximately 20% of all new cases of venous thromboembolisms (VTE) are associated with underlying cancer [1]. The risk increases further depending on the extensiveness and level of metastasis. The American Cancer Society estimates that there will be an estimated 1,735,350 new cancer cases diagnosed and 609,640 cancer deaths in the United States in 2018 [2]. Of those, 22,240 women will receive a new diagnosis of ovarian cancer in 2018 and approximately 14,070 women will die from it. Although the overall 5-year relative survival rate generally ranges between 30%-40% across the globe, it has seen only very modest increases (2%-4%) since 1995 [3]. Of all the malignancies, cancer of the ovary, brain and pancreas are among those with the highest risk of VTE, but cancers of the breast and lung, being the most common, will account for a higher proportion in absolute terms [4]. The cumulative incidence of VTE within 1year of diagnosis was 6.9% for brain cancer, 5.3 % for pancreatic cancer, 3.3% for ovarian cancer, 2.4% for lung cancer, and 0.9% for breast cancer [5]. Deep Vein Thrombosis (DVT) and Pulmonary Embolisms (PEs) are the most common complications of ovarian cancer, while PVT is one of the rare ones. In this study, we report on 2 rare cases of PVT following total abdominal hysterectomy and tumor debulking surgeries after ovarian cancer diagnosis.

Case Report 1

JA is a 45 years old female with recent abdominal pain for approximately a month. Pain started in the right lower abdomen and occasionally in the upper abdomen associated with nausea. Patient was experiencing pelvic pressure and occasional bloating, loss of appetite and weight loss of about 4 lbs over the last week. She had a history of right ovarian cyst. A week prior, she had gone to the ED for worsening pain and ultrasound showed a solid and cystic mass with multiple cystic loculations in the right adnexa. Her CA-125 was 1073. She went into surgery with Exploratory Laparotomy, Modified Radical Abdominal hysterectomy, Bilateral Salpingo Oophorectomy, infracolic and infragastric omentectomy, bilateral ureteralysis, Mobilization of hepatic and splenic flexures, ileotransverse resection and anastamosis, Rectosigmoid resection and anastamosis, Lysis of adhesions, Diverting Loop Ileostomy, Argon Beam Ablation, Para aortic lymph node dissection. Patient was diagnosed with stage IIIC high grade serous carcinoma. Patient was discharged from the hospital on (post op day 7) with prophylactic low molecular weight heparin for 28 days. She returned to the ED on (post op day 19) complaining of fever, nausea, fatigue, lower abdominal discomfort below her ostomy site. Patient was noted to have decreased output into her ileostomy. Patient reported 3-4 episodes of RLQ pain that can last up to an hour. CT showed moderate to large amount of ascitis and thrombosis of the right anterior

branch of the portal vein. She underwent parancentesis with negative cultures and negative cytology. Patient was started on Eliquis (Apixaban) for the Portal Vein Thrombosis (PVT), underwent paracentesis for the ascites that was negative for disease. Her pain and fevers resolved. All other cultures were negative. Patient was feeling better and was discharged on (Post op day 31). CT of the abdomen completed a month later showed that portal vein thrombosis had resolved. She was continued on anticoagulation for 6 months.

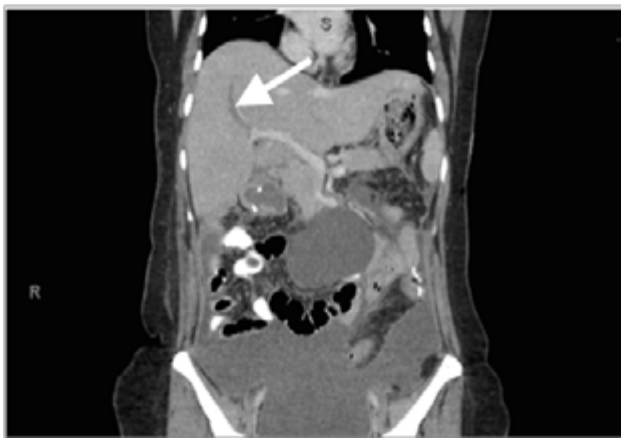

Figure1: Contrast enhanced computed tomography (CT) image showing thrombosis of the anterior branch of right portal vein

Case Report 2

KB is a 65 years old female with history of pelvic pressure and bloating, loss of appetite, abdominal distension and weight loss about 7Ibs in about a month. CT showed a 6cm cystic ovarian lesion with numerous peritoneal implants seen throughout the abdomen and pelvis. Her CA-125 was 1047. Patient underwent surgery with Exploratory Laparotomy, Omentectomy, Bilateral Salpingo oophorectomy. She had extensive disease in the abdomen and pelvis that was not completely debulkable at that time. Patient was diagnosed with stage IIIC high grade serous ovarian cancer. Recovery was uneventful. She underwent IV chemotherapy with Carboplatin and Paclitaxel. After 3 cycles of chemotherapy, patient underwent interval debulking surgery. During surgery, there was extensive disease noted throughout abdomen, especially posterior cul du sac and Rectosigmoid mass. Disease involved the spleen, the splenic flexure, right diaphragm, infra colic and infra gastric omentum, Bilateral pelvic and para colic side walls, small bowel mesentery, cecum, transverse colon, left renal capsule and appendix. Surgery involved exploratory Laparotomy, Optimal Tumor Debulking, Total Abdominal Hysterectomy, Bilateral Uretal lysis, Appendectomy, splenectomy, Mobilization of Splenic flexure, Right pelvic lymphadenectomy, and Argon beam ablation. By the end of the procedure there was no evidence of any gross residual disease in the abdomen and pelvis. Patient was discharged home on (Post op day 7) with prophylactic low molecular weight heparin for 28 days. Patient came in to the ED on post op day 15 complaining of abdominal pain, fever and chills, nausea and vomiting. Patient was febrile (39.2C), tachycardia (HR110s-140s), and WBC was elevated at 19.3. CT of the abdomen with IV contrast showed left upper quadrant abscess. A small amount of ascites and mesenteric fluid was observed in the lower abdomen and pelvis. Portal vein, splenic vein and left gonadal vein thrombosis. Abscess was drained and patient was started on low molecular weight heparin (Lovenox). Repeat CT completed later showed the thrombosis had resolved.

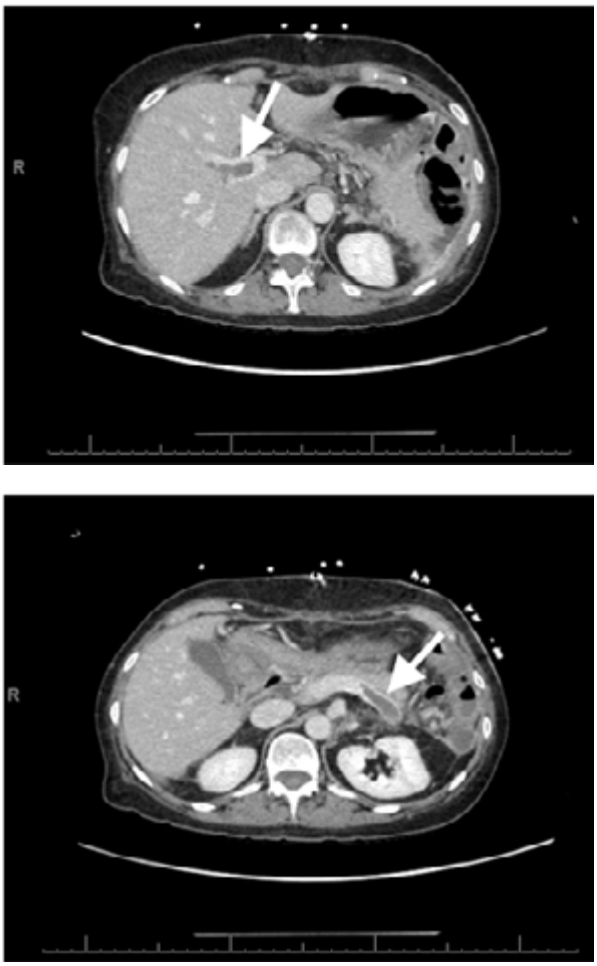

Figure 2.Contrast enhanced computed tomography (CT) image showing thrombosis of portal vein (left) and splenic vein (right)

Discussion

Dr. Armand Trousseau was the first to note the relationship between malignancy and the induction of a hypercoagualable state. This hypercoagulability occurs due to a variety of factors such as by activating the coagulation cascade, cancer cells being able to produce procoagulant substances, increased inflammatory cytokines, and so on. This state significantly increases morbidity and mortality currently representing the second most common cause of death in cancer patients [6]. A recent study showed that VTE was clearly associated with reduced survival, even after adjusting for age, race, gender, initial cancer stage and presence of chronic co-morbid medical conditions [7]. Despite the clear association between malignancy and hypercoagulability, the true event burden is often underestimated as thrombotic events can often be asymptomatic. A study conducted in 2004 showed that venous thrombosis is detected in up to half of all cancer patients at post-mortem examinations [8].

Among solid tumors, ovarian cancer is associated with one of the highest incidence rates of venous thrombosis [9]. There are several risk factors that patients with ovarian cancer have which increase their risk of VTE. The first factor is that the majority of patients present with advanced disease and the available space in the pelvis for it grow. Secondly, the intervention and treatment include radical abdominal surgery with long recovery and platinum based chemotherapy, which further the risk of venous thrombosis. Similar to other types of cancer, a thrombotic event significantly affects the morbidity and mortality rate. A Danish cancer registry study identified venous thrombosis within 4 months before the diagnosis of ovarian cancer and showed a worse prognosis in the group with thrombosis compared to without (1-year survival 44% and 63%, respectively) [10].

The clinical manifestations of a hypercoagulable state could range from the subclinical venous thromboembolism (VTE) to disseminated intravascular coagulation (DIC). The two most common thromboembolic complications of ovarian cancer are DVT and PE. However, it is important to keep PVT in mind when following these patients. PVT is one of the rare complications that can occur. Its incidence rate in the general population is less than 1% and is commonly associated with diseases of the liver [11]. Of the cases noted thus far, only 14% have identifiable causes. Of the 14%, 28% had cirrhosis, 23% had primary liver or gallbladder cancer, 44% had secondary hepatobiliary cancer, 3% had a myeloproliferative disorder, and 10% had evidence of an intra-abdominal infection or inflammation. In addition to the risk factors mentioned above, it is important to recognize the role of laparoscopic surgeries in the development of PVTs. A study involving a literature search spanning 17 years identified a total of 18 case reports of portomesenteric vein thrombosis following laparoscopic surgery [12]. Although studies have not definitively shown the cause of PVTs after laparoscopic surgeries, the leading theory is that increased intra abdominal pressure within pneumoperitoneum results in decreased portal venous blood flow, which may lead to a relative prothrombotic environment. In the case of our patients, the hypercoagulable state caused by their underlying malignancy was further heightened by the laparoscopic total abdominal hysterectomy they had to undergo.

The diagnosis of PVT is typically established using contrast enhanced CT or color Doppler Ultrasonography [13]. These imaging modalities will classically show evidence of portal vein occlusion. MRI can alternatively be used in patients who cannot undergo CT. Portal venography can be used as an alternative to diagnose PVT, however angiography is invasive and the other non-invasive modalities are generally preferred.

Management of PVT involves treatment of underlying disease process and anticoagulation therapy [11]. Anticoagulation is used to prevent the extension of the clot and to allow for recanalization so that intestinal infarction and other complications do not develop [14]. However, it is critical to rule out esophageal varices in cirrhotic patients in order to prevent catastrophic bleeding. Patients are generally started on low molecular weight heparin (LMWH) to establish rapid anticoagulation and then switched to oral coagulants. Treatment is generally recommended for at least three to six months, though long-term treatment is recommended for most patients with permanent thrombotic risk factors that cannot be corrected [11].

Conclusion

It is important to identify acute PVT in patients presenting with acute abdominal symptoms, such as abdominal pain, splenomegaly, spiking fever, ascites, nausea, and vomiting. These symptoms can be masked by the symptoms related to ovarian cancer and its treatment. Both our patients had exhibited some of the classic symptoms. It is just as important to understand that acute PVTs may be clinically silent and only diagnosed during radiological examinations. The most feared complication of acute PVT is intestinal infarction, which has a mortality rate of 20-40% [15]. Un treated acute PVT can also progress to chronic PVT and lead to portal hypertension and its associated sequelae, such as esophageal varices, ascites, and so on. Each of the cases discussed above indicate the importance of identifying PVT in a prompt manner in order to prevent these poor outcomes. Both patients did not have long lasting complications from the acute PVT and were alive at the time of writing of this report.

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