A case of subcapsular renal hematoma status post celiac artery thrombectomy

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A R T I C L E   I N F O

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A B S T R A C T

INTRODUCTION: 30 year old male with no significant past medical history presenting to the hospital with significant left-sided abdominal pain.

CASE PRESENTATION: Patient was found to have a thrombus within the celiac artery for which he underwent a catheter assisted thrombolysis procedure. Hypercoagulable work-up revealed evidence of a JAK 2 V617F mutation which is indicative of Polycythemia Vera. The patient returned the following day with considerable left-sided flank pain associated with shortness of breath, nausea, and vomiting. CT performed showed evidence of an expanding left renal subcapsular hematoma. Patient was treated conservatively with IV fluids and pain medication before he was discharged hemodynamically stable after a few days.

DISCUSSION/CONCLUSION: Accessory renal vessels can be a rare finding coming of the celiac artery and so, care must be taken to evaluate vascular anatomy to avoid iatrogenic injuries; a bleed from one of these vessels could lead to the development of a hematoma, as seen with this patient.

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1. Case

The patient is a 30 year old male without any significant past medical/surgical history who presented to the hospital due to 2 days of persistent left-sided abdominal pain. The pain was associated with significant nausea and diarrhea; oral intake worsened the pain while the use of Pepto-Bismol gave slight relief. On CT exam of his abdomen and pelvis, he was found to have an enlarged spleen measuring 15.2 cm × 7.1 cm × 13.3 cm in sagittal, transverse, and anterior-posterior dimensions, as well as having a few diverticula. His pain improved with the incorporation of IV fluids and pain management; he was discharged later on that day.

He presented back 12 days later complaining of similar pain, now more localized to the left upper quadrant. Repeat CT of abdomen and pelvis showed similar splenomegaly compared to previous scan. A soft tissue filling defect in the lumen of the celiac artery, suspicious of a thrombus vs soft noncalcified plaque, was also noted; it extended all the way to the common hepatic artery and splenic artery. At this time he was started on IV heparin. An Eksonic Endovascular System (EKOS) catheter was introduced by an experienced vascular surgeon through the left iliac artery and positioned in the proximal portion of the celiac trunk to assist in a catheter assisted thrombolysis; alteplase infusion was also initiated at 1 mg/hr as well as a heparin infusion at 500 units/hr. The patient tolerated the procedure well. The catheter was removed at bedside the following day and was discharged on aspirin and apixaban for anticoagulation, for which he was instructed to take for at least 3 months.

At this time, a hematology consult was performed due to elevated hemoglobin levels up to 18.1. An anticoagulation work-up was ordered which consisted of factor V Leiden, prothrombin gene mutation, lupus anticoagulant, anticardiolipin antibodies, homocysteine level and JAK2 mutation. Protein C, Protein S, and Antithrombin III were withheld due to the patient being on heparin at the time. JAK2 mutation and erythropoietin levels were also ordered due to suspicions of an underlying myeloproliferative disorder (ie/ Polycythemia Vera). Of the test ordered, a JAK2 V617F mutation was found.

The next morning the patient arrived back in the ED in significant amount of pain associated with shortness of breath and nausea. The pain persisted despite being given a dose of morphine and fentanyl; a dose of Dilaudid later on eventually seemed to provide some relief. CT angiogram of the chest showed no evidence of a pulmonary embolism. A CT scan of his abdomen and pelvis with and without contrast showed redemonstration of his celiac thrombus and splenomegaly. This time, however, his left kidney showed evidence of a left subcapsular hematoma (no measurements recorded on official read) with perinephric fat stranding and delayed excretion. An enhancement anterior to the left superficial femoral artery was also noted suspicious for a pseudaneurysm. The patient noted that he took his dose of 325 mg of Aspirin and 5 mg of apixaban that morning. Anticoagulation was held, urinary catheter was placed and was patient was made NPO. Nephrology team was consulted and recommended for the patient to remain off anticoagulation and on bed rest. They would follow the patient with serial hemoglobin levels and CT scans.

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Fig. 1. Figure depicting a left-sided subcapsular renal hematoma.

Fig. 2. Figure depicting various cell lines derived from a common myeloid precursor. (Myeloblast, 2020) [1].
Repeat CT scan 3 days later showed an increase in hematoma size (now measuring up to 3.6 cm) and retroperitoneal fat stranding – now extending adjacent to the abdominal aorta. The previous enhanced area suspicious for pseudoaneurysm in the left groin was no longer appreciated. The patient was monitored for the next 3 days and managed conservatively with IV fluids and pain medication. They remained to be hemodynamically stable and was discharged with instructions to follow up with his urologist and vascular surgeon in a week (Fig. 1).

2. Discussion

Myeloproliferative disorders are ones that cause cell lineages derived from the bone marrow to grow abnormally – these can include white blood cells, platelets, and red blood cells. A defect in any of these cell lines can lead to various downstream effects such as blood hyperviscosity, immunodeficiency, etc (Figs. 2 and 3).

Of these various disorders, Polycythemia Vera (PV) is one in particular that can result in variations to 3 cell lines. This can lead to an increase in blood viscosity, resulting in splenomegaly and an increase in propensity to be hypercoagulable – ultimately leading to thrombus formation. Patients can also complain of an itching sensation after warm shower and plethoric appearance. The 2016 World Health Organization’s criteria for diagnosis for males includes a hemoglobin >16.5 g/dL and hematocrit >49%; for females hemoglobin must be >16 g/dL or hematocrit >48%. Bone biopsies should be hypercellular as well as show evidence of a JAK2 V617F or JAK2 exon 12 mutation (Arber et al., 2016) [3]. These mutations result in uninterrupted enzymatic activity and signal transduction resulting in continuous proliferation (McLornan et al., 2006) [4]. Of these findings, this patient’s CT was consistent with splenomegaly as well as having a hemoglobin level as high as 18.1. The celiac artery thrombus could have likely been a result of an associated hypercoagulable state.

Vascular complications after catheterization procedures are extremely rare. In a study by Ricci et al., 7,690 catheterizations over 40 months were investigated; of those, only 111 (about 1.4%) experienced some kind of vascular complication (Ricci et al., 1994) [5]. Of these, various bleeding disorders, anticoagulants, or iatrogenic processes can increase the chances of bleeding within the renal system leading to hematoma formation. In this case, the patient had all 3 attributes – evidence of PV, being on apixaban, as well as undergoing catheterization. Of the iatrogenic causes, guide wire perforation of renal vessels is the most common. Although typically the renal arteries come off the descending aorta below the level of the Superior Mesenteric Artery, an accessory renal artery can be present in 25% of people and be bilateral in 10% (Sandring et al., 2008) [6]. Rarely, these can arise from the celiac trunk, superior/inferior mesenteric arteries, or the middle colic/sacral arteries (Knipe, 2020) [7], (Rao et al., 2011) [8]. Guidewire perforation is a possible complication of catheterization procedures; during the celiac catheterization process, the guidewire may damage an unknown accessory renal artery. The resulting bleed (especially while on anticoagulation) could lead to a similar subcapsular hematoma as seen with this patient (Yi et al., 2014) [9]. EKOS catheters utilize high frequency ultrasonic waves that can help break up and increase the permeability of clots for thrombolytic agents to penetrate through. As with the guidewire, the insertion of the EKOS catheter may cause iatrogenic injury to an accessory renal vessel (Niverthi et al., 2017) [10]. The contrast used with the procedure can also cause impairment to the kidneys themselves (EkosonicTM Endovascular System Brief Summary, 2020) [11]. The combination of these effects may damage the kidneys and make them more prone to bleeding and hematoma formation.

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Consent

No specifying identifying features were disclosed.

Author contribution

I, Peter Iskander, was the sole author/data collector/contributor to this case report.

Registration of research studies

Not applicable.

Guarantor

I, Peter Iskander, am responsible for the work of this study. Responsible for data collection, write up, submission.

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