

## A RARE COMPLICATION OF HEMORRHAGIC SHOCK FOLLOWING A PARACENTESIS; CASE REPORT

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### ABSTRACT

Paracentesis is a safe standard procedure to relieve abdominal ascites. Hemorrhagic complications following paracentesis include abdominal wall hematoma, hemoperitoneum, and pseudoaneurysm. Hemorrhagic shock following a paracentesis is a life threatening complication that requires close monitoring and prompt treatment. Herein, we present a rare case report of a 67-year old male with a decompensated liver disease that developed a hemorrhagic shock due to the development of hemoperitoneum following a paracentesis.

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### INTRODUCTION

Paracentesis is a relatively safe standard procedure to relieve abdominal ascites in decompensated liver disease patients. Hemorrhagic complications following

paracentesis can be divided into three categories: abdominal wall hematomas, hemoperitoneum, and pseudoaneurysm. Hemorrhagic shock following a hemorrhagic complication can occur. Patients with a recent paracentesis developing symptoms of abdominal pain and or swelling with signs of a low blood pressure and an elevated heart rate should be further evaluated for hemorrhagic complications. Patients with hemorrhagic complications following paracentesis should be monitored closely due to their higher risk of mortality.

### Case Presentation



Figure 1: Cirrhotic appearance of the liver with moderate to large volume ascites and splenomegaly. Diffuse mesenteric edema.

A 67-year old male with a past medical history of chronic alcohol dependence, diabetes mellitus, and essential hypertension presented to our emergency department after three days of hematemesis and multiple bloody stools. Associated symptoms included fatigue and generalized weakness. Patient reports an average of ten cans of 12 oz. beer per day. Denies any NSAID intake. Last EGD a year ago with no finding of esophageal varices or gastric abnormalities. No prior colonoscopy reported. On presentation, vital signs were as follows: body temperature 37.0°C, blood pressure 80/50 mmHg, heart rate 130 beats/min, respiratory rate 18 breaths/min, and oxygen saturation 98% on room air. Physical examination was noted for overall appearance of chronically ill-appearing man with poor dentition; Abdomen: distended with ascites noted; Skin: normal discoloration, normal temperature, and no spider

angioma was noted. Initial laboratory studies including complete blood count, chemistry panel, and hepatic function panel were notable for low hemoglobin level, elevated total bilirubin, creatinine level and blood urea nitrogen (BUN) (Table 1). Meld-Na score was 29 points. Initial abdominal and pelvis computerized tomography without IV contrast was notable for a cirrhotic appearance of the liver with moderate to large volume ascites and splenomegaly (figure 1).

Patient was transfused one unit of packed red blood cells (PRBC), two liters of Lactated Ringers at 150ml/hr rate. Patient was started on Protonix drip, Octreotide drip and Ceftriaxone 2mg IV daily. Blood pressure improved post transfusion with a systolic blood pressure (SBP) ~120mmhg and patient was admitted to the intensive care unit for closer observation.

**Table 1: Laboratory results on admission.**

Laboratory	Value	Reference range
White blood cell (10 <sup>3</sup> /uL)	9.6	4.8-10.8
Hemoglobin (gm/dL)	6.5	14.0-18.0
Hematocrit (%)	19.5	42.0-52.0
Platelets (10 <sup>3</sup> /uL)	160	150-450
Blood urea nitrogen (mg/dl)	39	7-18
Creatinine (mg/dL)	3.96	0.52-1.23
Aspartate aminotransferase (U/L)	24	15-37
Alanine transaminase (U/L)	11	12-78
Alkaline phosphatase (U/L)	175	45-117
Total bilirubin (mg/dL)	1.7	0.1-1.0

The following day (day 2), patient had an esophagogastroduodenoscopy with finding of extensive esophagitis in the distal one third of the esophagus but no evidence of esophageal varices. Hemoglobin has stabilized with an average of 7.5 GM/dL. Octreotide drip was discontinued and patient was downgraded to intermediate medicine care unit.



**Figure 2: New onset moderate hemoperitoneum, likely originating from the site of prior paracentesis puncture over the right mid abdomen.**

On day 3, patient had a paracentesis with a removal of 8500ml of amber-colored fluid with no post-procedure

complications reported and IV albumin was given. Later that night, patient was noted to have a low blood pressure reading with SBP of ~80mmhg. Patient was asymptomatic with no acute finding on physical exam. Patient was given albumin and IV fluid but blood pressure continued to remain low. Labs were significant for a hemoglobin level of 6.3 GM/dL. Patient was given one unit of red blood cell packet and started on norepinephrine to sustain an appropriate blood pressure with a target goal of SBP >65mmhg. CT angiogram abdomen and pelvis without and with IV contrast was done with a finding of new onset moderate hemoperitoneum, likely originating from the site of prior paracentesis puncture over the right middle abdomen with blood products extending from the right paracolic gutter into the dependent aspect of the pelvis (figure 2). Patient's blood pressure continued to be low and hemoglobin level repeat in four hours was 6.7 after the one unit of PRBC has already transfused. Patient was given two more units of PRBC and one unit of platelets. An emergent aortogram and selective angiography of the right inferior epigastric with an active extravasation noted and bleeding was stabilized.

The following day (day 4), patient's blood pressure has improved and norepinephrine was discontinued. Patient's hemoglobin has stabilized with an average of 7.5 GM/dL. Patient was downgraded to intermediate

medicine care unit and eventually discharged home the following day.

## DISCUSSION

Abdominal paracentesis is a procedure that is used commonly by physicians for relief of symptoms associated with ascites in patients with liver disease. Paracentesis is relatively a safe procedure with carrying approximately 1% risk of overall complications.<sup>[1]</sup> Complications secondary to paracentesis include leakage of ascetic fluid, local infection, intestinal perforation and hemorrhagic complication.<sup>[2]</sup> Hemorrhagic complication of paracentesis is defined as a bleeding event in a patient with no prior evidence of hemorrhagic ascites before paracentesis and then began to demonstrate hemorrhagic ascites and/or abdominal hematoma during or after procedure.<sup>[3,4]</sup> Timeline for hemorrhagic ascites to be consider as a complication due to a recent paracentesis is that it has to follow the procedure within 7 days. Hemorrhagic complication following paracentesis can be divided into three categories: abdominal wall hematomas, hemoperitoneum, and pseudoaneurysm.<sup>[5]</sup> Hemorrhagic shock requiring continuous blood transfusion and the use of vasopressors following a paracentesis has been identified rarely in the previous literature.

Symptoms and signs of hemorrhagic complication due to paracentesis can be difficult to identify as it can present from minutes to days after the procedure. In addition, patients that requires paracentesis are usually in decompensated liver disease which makes it difficult for clinicians to identify these complications. Symptoms as fatigue, abdominal pain and/or swelling are not frequently presented in these patients; therefore, it is important to closely monitor vital signs as well hemoglobin and BUN level for faster diagnose. Patients with a hemorrhagic complications due to a recent paracentesis have a higher rate of ICU care, acute kidney injury, and mortality rate therefore these complications need to be identified sooner for a better care.<sup>[6]</sup>

## CONCLUSION

Hemorrhagic complications following a paracentesis can present with an abdominal swelling, fever, and fatigue along with a low blood pressure and elevated heart rate. Hemorrhagic shock requiring vasopressors and massive blood transfusion protocol can occur as a complication following paracentesis. Patients with hemorrhagic complications should be monitored closely as they have a higher mortality rate.

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