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Case Report

Recurrent Traumatic Hepatic Pseudo Aneurysm from Accessory Right Hepatic Artery: A Case Report

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Abstract

Hepatic artery pseudoaneurysm is a known complication after liver trauma. There are not clear guidelines for detection of pseudoaneurysms after blunt hepatic trauma, however it can cause life-threatening complications such as rupture and hemorrhage. In most cases, Hepatic pseudoaneurysms are successfully managed with angioembolization. We present the first case of recurrent post-angioembolization pseudoaneurysm caused by accessory right hepatic artery.

Keywords: Case report; Blunt hepatic trauma; Liver pseudoaneurysm.

Introduction

Hepatic artery pseudoaneurysm is an uncommon complication after liver trauma. However, once detected, it should be addressed due to the risk of rupture. The incidence of traumatic hepatic pseudoaneurysm is 2.9% and the risk of formation is directly related with the grade of hepatic trauma, being 6.5% and 17.3% for grade IV and V liver injuries respectively [1]. We present the first case of recurrent right hepatic artery pseudoaneurysm secondary to an accessory right hepatic branch originating off the superior mesenteric artery.

Case presentation

66 years old female with no past medical history transferred from outside facility with 1 day history of abdominal pain, nausea, and vomiting. Of note, she had a mechanical fall 5 days prior to presentation hitting her abdomen against a washer machine. When she arrived at our facility, she became tachycardic up to 130 beats/min and hypotensive (70/50 mmHg). She was resuscitated with crystalloids with partial improvement of vital signs. CT scan demonstrated evidence of a right sided grade 4 liver laceration with active contrast extravasation (Figure 1). Subsequently massive transfusion protocol was activated, and the patient received blood products without appropriate response. For this reason, the patient was taken to the operating room for exploratory laparotomy. During the operation, two deep liver lacerations were identified, one deep laceration on the anterior aspect of segment 6 and 7, and the other inferior laceration through segment 6 extending into the caudate lobe. A Pringle maneuver was performed, and bleeding was controlled with surgical clips, aquamantis and perihepatic packing. A vacuum-assisted temporary closure (Abthera) was placed and the patient was taken to the ICU for further resuscitation. Postoperatively, the patient was stabilized. She was taken back to the operating room on post-operative day 2 for re-exploration. The packing was removed with no evidence of bleeding. Two large bore drains were placed around the liver and the fascia was closed. The patient remained intubated. Six hours after closure, she remained hemodynamically stable but developed hypoxic respiratory failure. CTA of the chest and abdomen was performed which showed bilateral pulmonary embolism and two hepatic pseudoaneurysms measuring 1.6 cm and 1 cm with no evidence of contrast extravasation (Figure 2). Interventional radiology was consulted and successful coil embolization of the

right posterior branch of the right hepatic artery was performed (Figure 3). Patient was started on heparin drip for treatment of pulmonary embolism. On postoperative day 9, the patient had sudden onset bloody output from JP drains (300 ml) and transient episode of hypotension accompanied by a drop of hemoglobin to 6.8 (from 7.8). The heparin drip was stopped, and another CTA of the abdomen was performed demonstrating 7 mm and 14 mm pseudoaneurysms that continue to be perfused distal to the previously placed coil (Figure 4). Interventional Radiology was once again consulted for re-embolization. The procedure demonstrated persistent contrast filling of the pseudoaneurysms, and additional coils were deployed. An IVC filter was placed at the conclusion of the procedure.

Subsequently, the patient did well, she remained hemodinamically stable and was discharged to a long-term facility with follow-up in clinic for drains removal on post-operative day 13. On Post-operative day 16, we received a call from the facility for new onset bloody output from the JP drains associated with tachycardia up to 120 and a hemoglobin level of 6.9 (hemoglobin before discharge: 7.8). CTA of abdomen was performed demonstrating 16 mm by 12 mm pseudoaneurysm distal to the coil pack and perihepatic fluid (Figure 5). The patient was admitted to the hospital and Interventional radiology was consulted. Repeat angiogram demonstrated an accessory right hepatic artery coming off the proximal superior mesenteric artery opacifying the right posterior hepatic artery pseudoaneurysm. Successful embolization of accessory right hepatic artery was performed (Figure 6). After the procedure, the patient remained hemodinamically stable, she was discharged to rehabilitation 3 days later. A CT was ordered 2 weeks later which demonstrated no evidence of pseudoaneurysm.

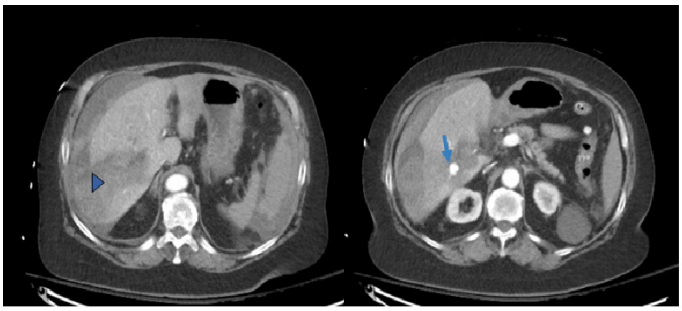

Figure 1: Grade IV liver laceration of the right hepatic lobe (arrowhead). Active extravasation of contrast (arrow).

Figure 2: Pseudoaneurysm with no contrast extravasation (arrowhead).

Figure 3: Angiogram demonstrating pseudoaneurysms (arrow head). Angiogram post-embolization (arrow) with no evidence of contrast extravasation.

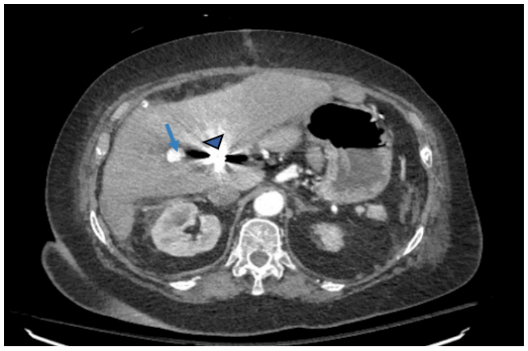

Figure 4: Presence of coils previously placed (arrowhead) with evidence of persistent pseudoaneurysm (arrow).

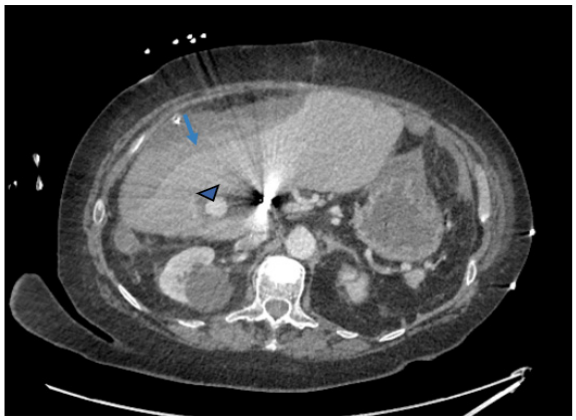

Figure 5: Pseudoaneurysm distal to the coil pack (arrowhead) with perihepatic fluid (arrow).

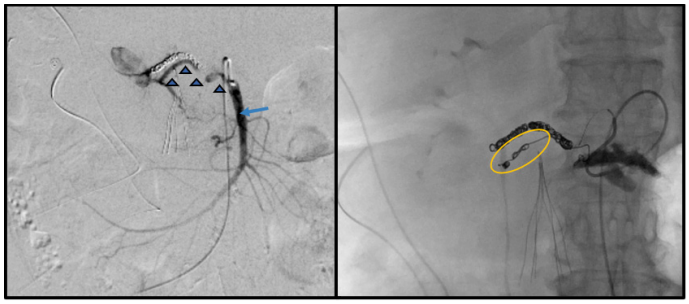

Figure 6: Angiogram demonstrating accessory right hepatic artery (arrowhead) originating from the superior mesenteric artery (arrow). Angiogram post-embolization of accesory right hepatic artery (circle).

Discussion/conclusion

Traumatic hepatic pseudoaneurysm can rupture and cause life-threatening hemorrhage. The mechanism of formation is not well understood but is most likely multifactorial including damage to the arterial vessel wall, exposure to bile acids and inflammation [2]. Ventro et al. found that the majority of hepatic pseudoaneurysms develop after penetrating liver trauma [3]. The Eastern Association for the Surgery of Trauma guidelines in 2012 do not give any recommendations for follow-up CT scans in patients with blunt traumatic injury [4]. Some retrospective studies in the last years have shown benefit of follow-up CT scan to detect traumatic hepatic pseudoaneurysms with subsequent successful angioembolization treatment [4,5]. Interventional radiology angioembolization has been a powerful adjunct in the conservative management of blunt liver trauma [6]. None of these studies describes persistence of pseudoaneurysm after angioembolization. Our case is unique because a right accessory hepatic artery coming from the superior mesenteric artery was not detected until the third interventional procedure. This anatomic anomaly is present in 3.4% of the population [7]. Surprisingly, the anatomic variant was not detected in the computed tomography angiography scans performed on multiple occasions. The accuracy, sensitivity, and specificity of computed tomography angiography to detect anatomic anomalies of the right hepatic artery are 98.5%, 96.3%, 98.8% respectively [8,9]. We conclude that anatomical variations can be a cause of recurrent traumatic pseudoaneurysm and should be considered early in the differential diagnosis.

Declarations

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Conflict of interest statement: None declared.

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