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Intracystic Hemorrhage In A Simple Liver Cyst Due To Dual Anti-Platelet Therapy After Percutaneous Coronary Intervention

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Abstract

Hemorrhage into a simple hepatic cyst often results in development of a complex cystic lesion, which makes this identical to a cystic tumor. We present a striking example of this decision-making in a patient with suspected intracystic hemorrhage from recent anti-platelet medication use post-percutaneous coronary intervention (PCI). 83-year-old male presented to the hospital with acute right upper quadrant (RUQ) abdominal pain, severe and constant. This was associated with nausea and constipation. Medical history was significant for recent PCI and initiation of dual anti-platelet therapy (DAPT) ten days ago, and chronic thrombocytopenia. Ultrasound and CT confirmed complex 12.8 x 11.4 x 12.4 cm hepatic cyst, with suspected, intracystic hemorrhage of a simple liver cyst. Given failed conservative management, surgical route was opted. Laparoscopic fenestration of the cyst yielded a large volume of bloody material confirming the diagnosis. Biopsy of the cyst wall showed simple liver cyst with an adherent blood clot. Aspirin was resumed post-operatively, and ticagrelor was continued throughout given the high risk of stent thrombosis. Intracystic hemorrhage in a simple liver cyst, though rare, is a possible complication of DAPT use after PCI. Further use of DAPT usually requires tailored approach to patient's coronary anatomy, nature of stent used, underlying risk factors and type of bleed.

Keywords

Intracystic hemorrhage, Simple liver cyst, Dual antiplatelet therapy

Conflict of Interest Statement

There are no conflicts of interest for all authors.

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CASE REPORT

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Abstract

Hemorrhage into a simple hepatic cyst often results in development of a complex cystic lesion, which makes this identical to a cystic tumor. We present a striking example of this decision-making in a patient with suspected intracystic hemorrhage from recent anti-platelet medication use post-percutaneous coronary intervention (PCI). 83-year-old male presented to the hospital with acute right upper quadrant (RUQ) abdominal pain, severe and constant. This was associated with nausea and constipation. Medical history was significant for recent PCI and initiation of dual anti-platelet therapy (DAPT) ten days ago, and chronic thrombocytopenia. Ultrasound and CT confirmed complex 12.8 × 11.4 × 12.4 cm hepatic cyst, with suspected, intracystic hemorrhage of a simple liver cyst. Given failed conservative management, surgical route was opted. Laparoscopic fenestration of the cyst yielded a large volume of bloody material confirming the diagnosis. Biopsy of the cyst wall showed simple liver cyst with an adherent blood clot. Aspirin was resumed post-operatively, and ticagrelor was continued throughout given the high risk of stent thrombosis. Intracystic hemorrhage in a simple liver cyst, though rare, is a possible complication of DAPT use after PCI. Further use of DAPT usually requires tailored approach to patient's coronary anatomy, nature of stent used, underlying risk factors and type of bleed.

Keywords: Intracystic hemorrhage, Simple liver cyst, Dual antiplatelet therapy

1. Introduction

Hemorrhage into a simple hepatic cyst often results in development of a complex cystic lesion, which makes this identical to a cystic tumor.[1] This represents a difficult differential diagnosis because of its imaging similarities, and often tumor markers have poor diagnostic accuracy for hepatic simple cysts.[2] Though liver cysts are common up to 5–10%, complications arising from this are uncommon and management decisions are uncertain given its paucity of supporting data.[3] We present a striking example of this decision-making in a patient with suspected intracystic hemorrhage from recent anti-platelet medication use post-percutaneous coronary intervention (PCI).

2. Case presentation

An 83-year-old male presented to the hospital with a 3-day history of sudden onset constipation and acute right upper quadrant (RUQ) abdominal pain. The pain was described as severe with 10/10 in intensity, sharp in nature and constant throughout the day. The pain was non-radiating and aggravated with minimal movement. Associated with intermittent nausea, and constipation which was an unusual symptom for the patient. He additionally reported no fever, chills, emesis, and any urinary discomfort including dysuria or increased frequency. No recent travel and no new outdoor activities. His past medical history is notable for ischemic cardiomyopathy with known coronary artery disease with a recent PCI ten days prior to admission, and

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longstanding leukopenia/thrombocytopenia in the setting of IgA gammopathy/monoclonal gammopathy of undetermined significance (MGUS). He had not been using any medication other than his prescription medications which included dual-antiplatelet therapy (DAPT) with aspirin and ticagrelor, atorvastatin, carvedilol, and sacubitril-valsartan.

Clinical examination revealed stable vital signs, mild abdominal distention and significant RUQ tenderness without rebound tenderness or guarding. Normal bowel sounds were appreciated, and the rest of the systemic examination was unremarkable. Initial laboratory workup was notable for mild leukopenia of $3.6 \times 10^3/\mu l$, thrombocytopenia of $146 \times 10^3/\mu l$ with normal hemoglobin of 13.3 g/dl. These were not far from his baseline cytopenia. Coagulation profile including prothrombin time, renal and hepatic functions were unremarkable.

Ultrasound abdomen revealed a 13.9 cm right hepatic lobe cyst filled with debris (Fig. 1), raising concern for ruptured hepatic cyst with suspected blood products. Subsequently, given the degree of pain out of proportion to other clinical findings, computed tomography imaging of abdomen with intravenous contrast was sought. This re-demonstrated a sizeable hepatic cyst $12.8 \times 11.4 \times 12.4$ cm without a solid nodular component (Fig. 2, **Panel A**) and Hounsfield scale measuring >10 units suggestive of a mixed component, and possibly hemorrhagic component to the cystic fluid (Fig. 2, **Panel B**). No prior abdominal scans were available for comparison. Based on the radiographic size and appearance of the cyst, acuity and constant pain minimally relived with opioid analgesics, baseline thrombocytopenia, and the recent addition of DAPT, intracystic hemorrhage of a simple liver cyst was suspected.

With the complex appearance and age of the patient at presentation, a malignant tumor with spontaneous hemorrhage could not be ruled out. Image-guided aspiration of the cystic contents was not considered the best approach due to high recurrence rates. Given that patient failed a conservative approach with expectant management for 5 days, a surgical route was opted, and general surgery was consulted. After discussing the potential risk of stent thrombosis while holding DAPT given recent PCI and the overall risk of recurrence of liver cysts, patient ultimately decided to pursue a definitive surgical route. Successively, he underwent successful laparoscopic fenestration of the cyst, which yielded a large volume of bloody material intra-operatively confirming the diagnosis. Biopsy of the cyst wall turned out to be a simple liver cyst with an adherent blood clot. Aspirin was briefly held for four days before the procedure and was restarted the next day. Ticagrelor was continued during the entire time given the relatively high risk of stent thrombosis after discussing with cardiology. There was marked clinical improvement following the procedure and follow-up visits showed complete resolution of his

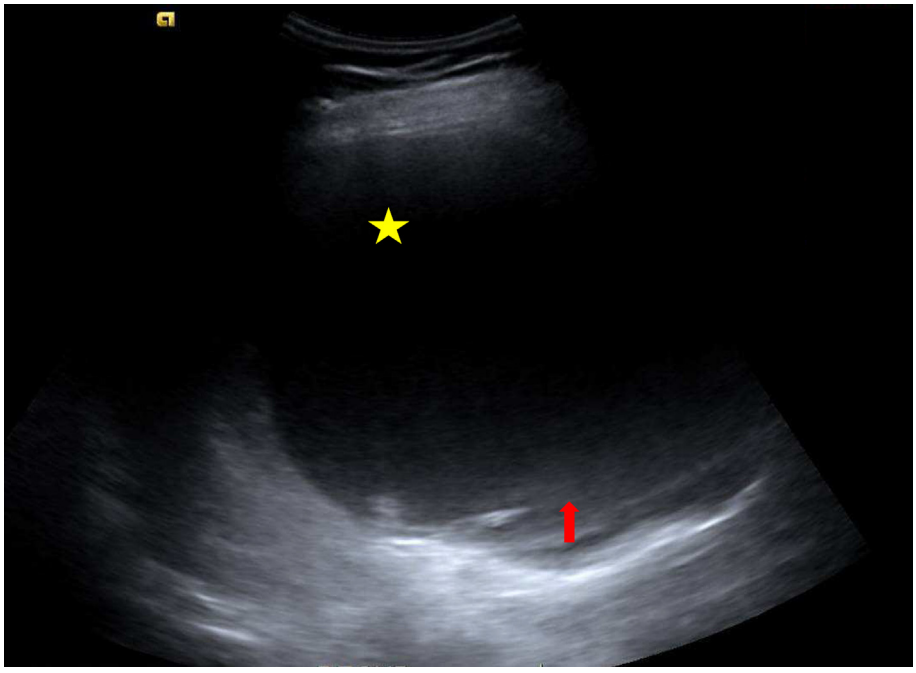

Fig. 1. Ultrasound imaging showing a 13.9 cm hepatic cyst (yellow star) filled with debris (red arrow) at the bottom suggestive of blood products.

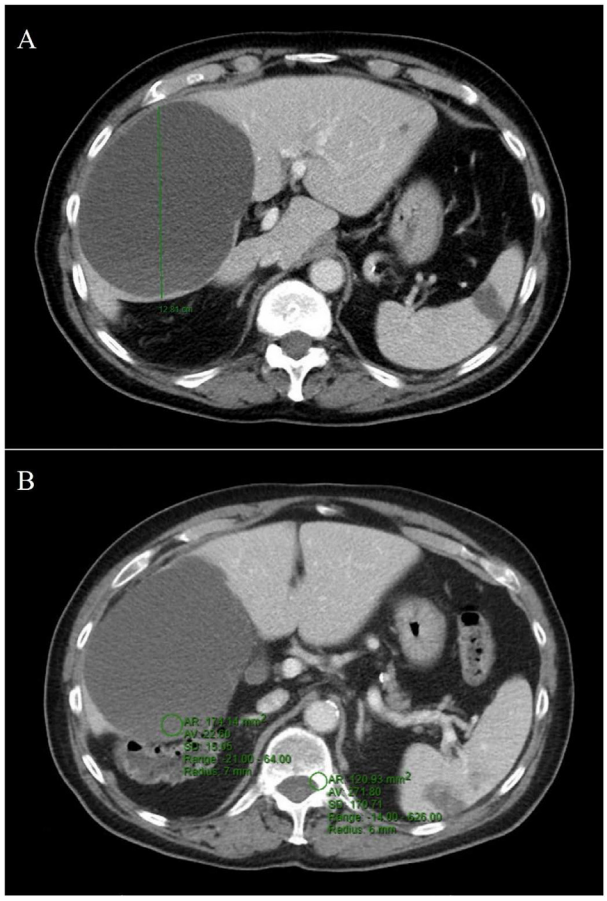

*Fig. 2. Computed tomography imaging of abdomen with intravenous contrast demonstrating a sizeable hepatic cyst 12.8 × 11.4 × 12.4 cm without a solid nodular component (**Panel A**), and Hounsfield scale (depicted as AV on annotation) showing a mixed component to the liver cyst with >10 units (in comparison to the bone marked) on **Panel B**.*

symptoms with a plan to repeat imaging periodically to evaluate for recurrence for liver cysts.

3. Discussion

Liver cysts are heterogeneous disorders that vary in incidence, etiology, and clinical manifestations.[3] They are classified into simple, polycystic, parasitic, neoplastic, and duct-related cysts. Simple liver cysts are benign, mostly asymptomatic, and incidentally diagnosed with an estimated prevalence of 5–10%.[3] Their prevalence increases with age, and they are more commonly found among females.[1] They are clear fluid-containing cystic lesions that commonly do not communicate with the intrahepatic biliary tree and usually increase in size with age as a biliary lining secretes fluid into the cyst.[1] A minority of hepatic cysts cause symptoms and are rarely associated with serious morbidity and mortality.[2,4] Ultrasound typically shows an anechoic, fluid-filled cystic lesion with homogeneous intra-cystic contents, and CT would show no further enhancement with contrast or internal structures.[4] In general, for benign liver cysts, the presence of multiple cysts, cysts greater >4–5 cm, septations, calcifications, fenestrations, heterogeneity, or symptoms on presentation are not typical and necessitates further diagnostic evaluation.[4]

Symptoms mainly depend on the cyst size and can include abdominal pain, distention, nausea, vomiting, esophageal reflux, early satiety, shortness of breath, and lower back pain.[2,3] Rare complications include compression of adjacent structures like a biliary tree or portal vasculature in 3–9% of cases, intracystic hemorrhage in 2–5% of cases, infection in 1% of cases, and very rarely rupture.[5] Intracystic hemorrhage can be spontaneous, precipitated by trauma or may be promoted by anticoagulant or antiplatelet therapy. It commonly presents with acute onset severe abdominal pain. It is hypothesized to occur due to increased intracystic pressure leading to sloughing and necrosis of epithelial lining and injury of underlying fragile blood vessels.[6]

It has been reported that anticoagulant and antiplatelet therapy does not appear to increase the risk of bleeding from liver tumors.[7] In contrast, there are also a few case reports in which intracystic hemorrhage has been related to anticoagulant or antiplatelet use, and this is most likely the mechanism behind the spontaneous bleed in a possibly long-standing simple hepatic cyst in our patient who was recently initiated on DAPT.[8,9] Although he did have a history of chronic thrombocytopenia, his platelet count was 146 × 10^3/μl, which one could argue is not critical enough to cause spontaneous bleeding. In contrast to our patient, in the case reported by Purdy et al. describing similar liver cyst rupture, the platelets were 3-times lower at 42 × 10^3/μl with an abnormal coagulation study.[8] To the best of our knowledge, we did not come across any prior reported case of intracystic hemorrhage in association with DAPT use following PCI. It is recommended to monitor liver lesions with a potential risk for malignant or hemorrhagic transformation with serial imaging for two years, and if they remain stable, further surveillance can be stopped.[4,10] There have been reported cases of dysregulated coagulation pathways in plasma cell disorders, such as in MGUS noted in our patient, but frequently presented with abnormal coagulation profile which was strikingly normal in our patient arguing against a coagulopathy precipitating this presentation.[11,12] Given the paucity of literature on etiology of why this

increased intracystic pressure occurs owing to the infrequent nature of the liver cyst rupture, given lack of direct trauma or necrosis on biopsy, it remains unclear what could have triggered this rupture beyond a particular critical size of the cyst.

Usually, when asymptomatic, incidentally identified simple hepatic cysts do not need follow-up or treatment, and merit management only when presenting with symptoms secondary to hemorrhage, rupture or infection.[4] In the setting of severe symptoms or complications, treatment options include needle aspiration with an injection of a sclerosing agent, internal cyst drainage with cystojejunostomy, laparoscopic or open surgical cyst fenestration, and liver resection.[4] Laparoscopic fenestration is a safe and highly effective measure with a low recurrence and morbidity rate.[4] Percutaneous drainage is not preferable due to the high rates of recurrences. More radical approaches like cyst enucleation and partial liver resection have increased morbidity and are unfavorable in patients with benign disease, and regardless of approach, decision to pursue surgical approach is usually driven by diagnostic uncertainty.[4]

4. Conclusion

Intracystic hemorrhage in a simple liver cyst, though rare, is a possible complication of DAPT use after PCI. It can present with sudden onset and severe abdominal pain, and without a significant drop in hemoglobin. Less common intra-abdominal bleeding complications should be in the differential diagnosis of such presentations, and surgical approach might be warranted if there is diagnostic uncertainty. Further use of DAPT usually requires tailored approach to patient's coronary anatomy, nature of stent used, underlying risk factors and type of bleed.

Author Contribution

Conceptualization, Supervision, Validation, Writing − original draft, Writing − review & editing.

Conflicts of interest

The authors state there are no conflicts of interest.

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