

Imaging Modalities for Diagnosing Hepatolithiasis: A Case Report of Multiple Hepatolithiasis

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Abstract

Hepatolithiasis or intrahepatic duct stones is uncommon in western setting, but it has quite a high prevalence in far eastern countries. The natural history of the disease may not be well understood in a western society, however due to increasing immigration, there are increasing numbers of cases that have occurred and will only continue occurring. The case report is regarding an elderly lady with previous complicated cholecystectomy presented with worsening recurrent right upper quadrant pain. Computed tomography (CT) and magnetic resonance imaging (MRI) interestingly revealed multiple intraductal hepatolithiasis. The aim of imaging should be to accurately identify the biliary tree and liver anatomy, stones, stricture, liver segment involved and excluding complication such as abscesses or cholangiocarcinoma.

Keywords

Hepatolithiasis, Intrahepatic Ductal Stone, Magnetic Resonance Imaging, Western

1. Introduction

Hepatolithiasis or intrahepatic duct stones is uncommon in western setting, but it has quite a high prevalence in far eastern countries. The natural history of the disease may not be well understood in a western society, however, due to increasing immigration, there are increasing numbers of cases that have occurred and will only continue occurring. Computed tomography (Ct) and abdominal ultrasound (USS) have remained the principle imaging modalities for diagnosing hepatolithiasis [1]. Interestingly, the case below depicts a middle-aged lady with

imaging proven numerous intrahepatic stones despite having a cholecystectomy done 50 years ago.

2. Case Report

A 70-year-old female of East Asian origin, with previous open complicated cholecystectomy done 50 years ago presented with recurrent episode of right upper quadrant abdominal pain. The pain was dull, non-radiating, flares up every few months and the onset of pain is usually triggered by a meal of oily food. She denies any loss of appetite, fever and weight loss. She is also not on any regular medication.

On examination, there were no signs of jaundice, and her vital signs were stable. There is a midline laparotomy scar with a soft non distended abdomen and tenderness over the right upper quadrant. Blood results depicted a raised in alkaline phosphatase (ALP) and gamma-glutamyl transferase (GGT) at 120 U/L and 228 U/L each respectively. Bilirubin, alanine transaminase (ALT), aspartate aminotransferase (AST) and white blood cell (WBC) were within normal range.

A contrast -enhanced computed tomography (CT) imaging demonstrated extensive intra and extrahepatic bile duct dilatation with presence of multiple rounded and spontaneously hyperdense object within intra and extrahepatic biliary tree (**Figure 1, Figure 2**). A magnetic resonance imaging (MRI) liver was performed which supported the findings of the CT and showed extensive hepatolithiasis throughout the intrahepatic bile duct in the right and left lobe of liver (**Figure 3, Figure 4**).

She was referred to the hepatobiliary (HPB) team, and after reviewing some of the images, it was thought that she had a previous lateral choledochoduodenostomy done 50 years ago during her complicated cholecystectomy. She subsequently had her hepatolithiasis surgically managed with an open revision of her side-to-side choledochoduodenostomy. There was significant stones burden bilaterally on the 2nd, 3rd, and 4th order of the ducts and the stones were extracted

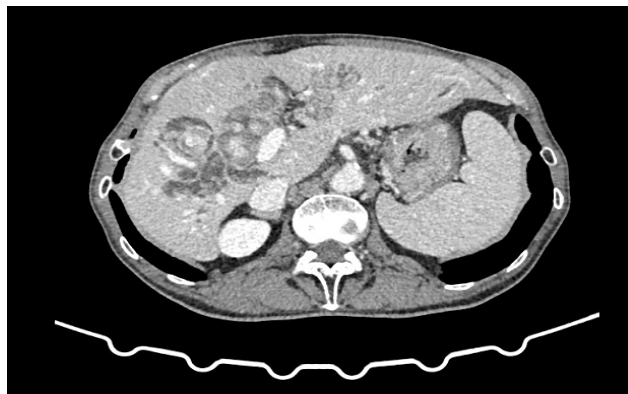


Figure 1. Computed tomography abdomen and pelvis imaging at time of presentation (axial view), demonstrating multiple solid echogenic lesions in liver parenchyma correspond to multiple intrahepatic duct stones.



Figure 2. Computed tomography abdomen and pelvis imaging at time of presentation (coronal view), demonstrating multiple solid echogenic lesions in liver parenchyma correspond to multiple intrahepatic duct stones.

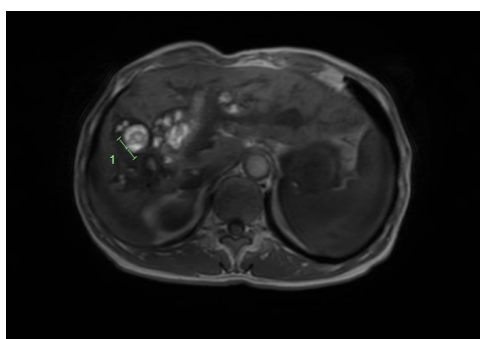


Figure 3. MRI T1 axial images of a 2 cm right intrahepatic duct calculi.



Figure 4. MRI T2 coronal images of the intrahepatic duct calculi.

until clear. The bilioenteral continuity was then re-established. She was subsequently discharged home from the hospital after 10 days stay in hospital.

3. Discussion

Hepatholithiasis is rare in the western society with a prevalence of 0.6% - 1.3% but can be quite common in the Asian -Pacific region with some literature suggesting up to 30% - 50% [2]. Due to the increased rate of immigration, there are increasing numbers of cases noted in the west as depicted in this case report. Intrahepatic duct stone affect people commonly in the 5th and 6th decade with no gender preferences [1]. Hepatolithiasis is also associated with cholangiocarcinoma with prevalence up to 2.4% - 10% and hence, a high index of suspicion is required when diagnosing hepatolithiasis [2]. Tailored modern imaging such as ultrasound, cholangiography, contrasted CT and MRI can be useful in the planning of future surgery or intervention. The aim of the imaging should be to accurately identify the biliary tree and liver anatomy, stones, stricture, liver segment involved and excluding complication such as abscesses or cholangiocarcinoma [3]. Often, in cases of hepatolithiasis associated cholangiocarcinoma, the presenting symptoms could just be abdominal pain; with blood laboratory test sometimes showing mild increased in alkaline phosphatase (ALP), bilirubin and Ca 19-9 [4]. The next step of workup may include cross sectional imaging however the limitation, like in the case discussed above is differentiating cholangiocarcinoma from fibrosis. CT is important in order to look for periductal soft tissue density, increase enhancement of biliary ducts in portal venous images, lymph node enlargement, portal vein obstruction, vascular encasement and extrahepatic metastatic [5]. MRI can be used to detect intraductal lesions, intrahepatic metastatic and satellite lesions whereas positron emission tomography (PET) scan is useful in identifying distant metastatic [6] [7].

4. Conclusion

Hepatholithiasis is becoming more prevalent in the western society these days and a tailored modern imaging with a high index of suspicion for any potential complications such as cholangiocarcinoma and cholangitis is recommended. Management of hepatolithiasis can be complex and multidisciplinary approaches with interventional radiologist, gastroenterologist and surgeons are imperative in managing symptomatic hepatolithiasis.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- [1] Adhikari, L., Achhami, E., Bhattarai, N., Kandel, A. and Shrestha, A.B. (2022) Diagnosis and Management of Hepatolithiasis in an Adult Patient: A Case Report. *Annals of Medicine and Surgery*, **82**, 104788. <https://doi.org/10.1016/j.amsu.2022.104788>
- [2] Sakpal, S.V., Babel, N. and Chamberlain, R.S. (2009) Surgical Management of He-

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- patolithiasis. *HPB*, **11**, 194-202. <https://doi.org/10.1111/j.1477-2574.2009.00046.x>
- [3] Chan, F.L., Chan, J.K. and Leong, L.L. (1997) Modern Imaging in the Evaluation of Hepatolithiasis. *Hepatogastroenterology*, **44**, 358-369.
- [4] Jo, J.H., Chung, M.J., Park, J.Y., Bang, S., *et al.* (2013) High Serum CA19-9 Levels Are Associated with an Increased Risk of Cholangiocarcinoma in Patients with Intrahepatic Duct Stones: A Case-Control Study. *Surgical Endoscopy*, **27**, 4210-4216. <https://doi.org/10.1007/s00464-013-3025-1>
- [5] Kim, H.J., Kim, J.S., Joo, M.K., Lee, B.J., Kim, J.H., *et al.* (2015) Hepatolithiasis and Intrahepatic Cholangiocarcinoma: A Review. *World Journal of Gastroenterology*, **21**, 13418-13431. <https://doi.org/10.3748/wjg.v21.i48.13418>
- [6] Sainani, N.I., Catalano, O.A., Holalkere, N.S., Zhu, A.X., Hahn, P.F., *et al.* (2008) Cholangiocarcinoma: Current and Novel Imaging Techniques. *Radiographics*, **28**, 1263-1287. <https://doi.org/10.1148/rg.285075183>
- [7] Lan, B.Y., Kwee, S.A. and Wong, L.L. (2012) Positron Emission Tomography in Hepatobiliary and Pancreatic Malignancies: A Review. *The American Journal of Surgery*, **204**, 232-241. <https://doi.org/10.1016/j.amjsurg.2011.07.025>