



Left Hepatic Lobe Torsion & Infarction, A Rare Cause of Acute Abdominal Emergency

Muhammad Afzal Randhawa*, Yumna Khan, Iftikhar Ahmed and Aamrasaeed

Department of General Surgery, Bahawal Victoria Hospital, Quaid-E-Azam Medical College, Pakistan

Abstract

Introduction: Hepatic lobe torsion causing abdominal symptoms can be frequently seen in dogs, rabbits and few other mammals. There are reported cases of torsion of Accessory hepatic lobes in humans. This is the first time that a case of torsion & infarction of anatomical left hepatic lobe causing acute abdominal emergency and leading to surgical exploration is being presented in a female patient.

Presentation: A 19 year old female presented with acute abdominal emergency. After initial workup we decided to do an exploratory laparotomy. During exploration, it was found that anatomical left liver lobe went into torsion/infarction resulting in capsular rupture and significant Hemoperitoneum. Left hepatic lobe was removed (left lateral tri-segmentectomy). Patient was discharged on 3rd POD without any complication during hospital stay and a normal routine follow-up.

Discussion: Rare/unusual reported causes of acute abdominal symptoms include torsion of Accessory hepatic lobes, torsion of falciform ligament, torsion of pedunculated hemangioma, rupture of Benign liver tumors, Omental torsion, Focal fat necrosis, torsion of appendix epiploicae and mesenteric panniculitis. Most cases of liver infarction occur after liver Transplantation, Hepatic artery occlusion, Trauma, Shock, HELLP Syndrome and Hyper-coagulable state.

Conclusion: A high suspicion of index should be kept for rare causes of acute abdomen, whenever there is un-usual presentation. Detailed laboratory/radiological investigations should be done in such patients. In many cases, diagnosis is usually made upon surgical exploration.

Keywords: Torsion; Infarction; Hepatic lobe; Acute abdomen

Introduction

Liver is the second largest organ in human body after skin, weighing approximately 1500 grams. It lies mainly in right upper abdomen under cover of 7-11 ribs [1]. It is supported in its position mainly by IVC, Coronary & Triangular ligaments, falciform ligament and ligamentum venosum [2]. Anatomically it is divided into two major lobes i.e. right and left lobe, also two minor lobes i.e. caudate and quadrate lobe. Lesser omentum of liver attaches it to superior surface of duodenum and lesser curvature of stomach. Hepatoduodenal ligament contains portal triad i.e. bile duct, hepatic artery and portal vein. Couinaud divides liver functionally into right and left liver marked by Cantlie's line. Liver has eight segments which have key functional and surgical important during resections. Knowledge of biliary system or portal venous supply is also very important and any variations in these can be challenging during hepatobiliary surgery [3,4].

Hepatobiliary congenital anomalies are common. These variations have largely been reported in the biliary tree and hepatobiliary vasculature. The liver also shows variations in its fissures, lobes and processes both on its visceral and diaphragmatic surfaces [5]. Detailed pre-operative imaging of biliary and portal system is the key to successful hepatobiliary surgery. In a normal liver, right & left hepatic arteries and ducts, as well as branches of right & left portal vein do not communicate, so it becomes possible to perform hepatic lobectomies/segmentectomies without excessive bleeding. Liver is a friable structure with a thin capsule so it can easily rupture after trauma.

Preoperative assessment that includes evaluation of liver volume and function of the remnant liver is a mandatory prerequisite before major hepatectomy. The critical residual liver volume for patients able to predict PHLF (Post-operative Liver Function) is mainly related to the presence of pre-existing liver disease and liver function. Among patients with normal liver, the limit for safe resection ranges from 20% to 30% future remnant liver of total liver volume. In patients with injured

OPEN ACCESS

*Correspondence:

Muhammad Afzal Randhawa,
Department of General Surgery,
Bahawal Victoria Hospital, Quaid-E-
Azam Medical College, Bahawalpur,
Pakistan,
E-mail: dr_afzal_randhawa1986@
hotmail.com

Received Date: 16 May 2019

Accepted Date: 14 Jun 2019

Published Date: 20 Jun 2019

Citation:

Randhawa MA, Khan Y, Ahmed I,
Aamrasaeed. Left Hepatic Lobe Torsion
& Infarction, A Rare Cause of Acute
Abdominal Emergency. *World J Surg
Surgical Res.* 2019; 2: 1136.

Copyright © 2019 Muhammad Afzal
Randhawa. This is an open access
article distributed under the Creative
Commons Attribution License, which
permits unrestricted use, distribution,
and reproduction in any medium,
provided the original work is properly
cited.

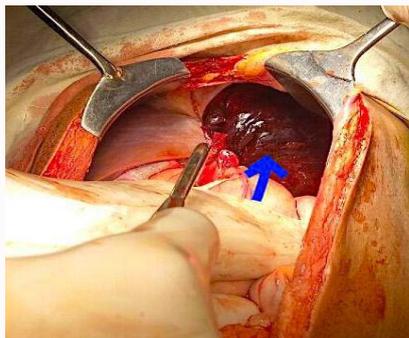


Figure 1: Blue arrow shows twisted left anatomical liver lobe.

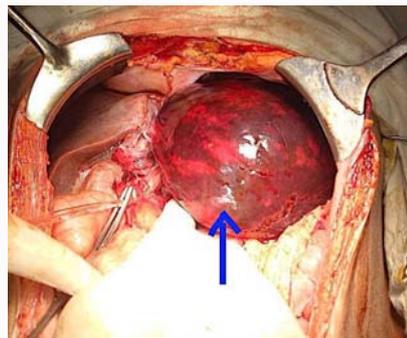


Figure 2: Arrow shows 360 degree de-twisted left lobe.

liver (cirrhosis, cholestasis or steatosis), preoperative assessment of the risk of PHLF should include future remnant liver volumetry and accurate liver function evaluation, including different dynamic liver function tests [6].

Case Presentation

Our patient, a 19 years old female presented to emergency department with abdominal pain, which was started 3 days earlier. Initially pain was mild in intensity and limited to upper abdomen only, but with the passage of time the pain became severe and generalized. Pain was associated with few episodes of vomiting, nausea and anorexia. Her past medical and surgical history was insignificant apart from decreased appetite occasionally.

On examination she was pale & anxious with HR: 105, RR: 20, BP: 100/60 mm of Hg and Temp: 99 F. There was no jaundice, cyanosis or any lymphadenopathy. On abdominal examination, it was mildly distended with marked epigastric fullness, mild generalized tenderness and sluggish bowel sounds. Her Erect abdominal X-ray showed no air fluid levels or gas under diaphragm. Abdominal USG showed moderate amount of free fluid in whole of abdomen.

Her TLC was 17000/mm³, HB: 8.1 g/dl, Sr. Bilirubin total: 1.0 mg/dl, SGPT: 70U/L, Alk. Phosphatase 220 U/L. Her PT/INR, RFTs, Sr. Electrolytes, Sr. Amylase, CUE and Sr. Albumin were within normal range.

After proper resuscitation and transfusion of blood, it was decided to do an exploratory laparotomy in context of her un-resolving symptoms and for confirmation of diagnosis.

Upon exploration, it was found that left anatomical liver lobe was completely (360 degrees) twisted on its pedicle. Left lobe was infarcted and significantly swollen. Liver capsule was ruptured at multiple sites, both on anterior and posterior surface of left lobe.

The right lobe was normal apart from a long hanging gallbladder with a long mesentery attached to right lobe of liver. There was approx. 1000 ml blood in peritoneal cavity. Rest of abdomen was normal.

After de-twisting the left lobe, it was removed by ligating its pedicle with delayed absorbable sutures, cholecystectomy was done to prevent future torsion of hanging gallbladder and abdominal lavage was done with warm saline.

Two 20F Nelton’s drains were left in lesser sac and pelvic cavity, which were removed on second POD without any significant effluent. Histopathological examination of removed lobe showed liver tissue and no tumor. Patient had uneventful hospital stay and was

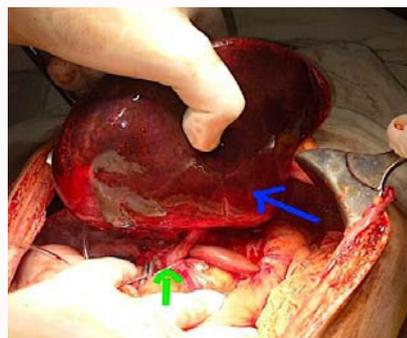


Figure 3: Shows left lobe mobilized upon its pedicle, just before removal.



Figure 4: Infarcted lobe with multiple capsular ruptures.

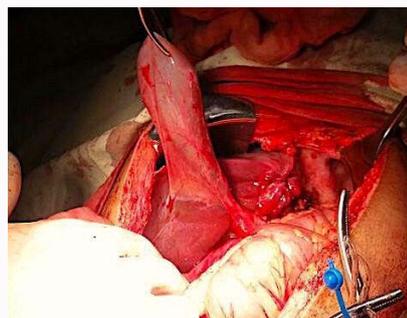


Figure 5: Shows long hanging gallbladder with its mesentery.

discharged on 3rd POD. Her follow-up visits are without any sequelae.

Discussion

Rare/unusual reported causes of acute abdominal symptoms include torsion of accessory hepatic lobes, torsion of falciform ligament, torsion of pedunculated hemangioma, Rupture of benign liver tumors, Omental torsion, Focal fat necrosis, torsion of appendix epiploicae and mesenteric panniculitis. Most cases of liver infarction

occur after liver Transplantation, Hepatic artery occlusion [7], Trauma, Shock, HELLP Syndrome and Hyper-coagulable state.

Accessory hepatic lobe is a rare anomaly. Most cases with accessory liver tissue are not detected since they do not cause symptoms. However, they can give rise to various clinical symptoms like recurrent abdominal pain, impaired liver function and hepatic ischemia caused by complete vascular occlusion due to a twisted accessory liver lobe, even needing orthotopic liver transplantation [8]. Usually, the diagnosis is made after laparotomy & histopathological confirmation.

Accessory Liver Lobe (ALL) is characterized by the presence of hepatic tissue outside of, but attached to, the liver. ALL is usually asymptomatic, but in the case of torsion, it can be confused with an acute surgical emergency or a tumor mass. Diagnosis is generally made during laparotomy. Laparoscopy can also be used for diagnosis and treatment i.e. resection of accessory hepatic lobe torsion [10].

To date, there are 24 reported human cases of liver torsion. Most are in women and under age 65. Oldest reported case of accessory lobe torsion is in a 65 year old female. There could be a sudden rise in transaminases during the active process of liver torsion. CT and US findings of an accessory liver lobe may be helpful, but diagnosis of liver torsion remains a challenge. Prompt recognition and treatment of this condition is necessary to prevent subsequent morbidity and mortality [9,11].

Life-threatening problems and should therefore be kept in mind in patients presenting with acute abdominal pain. Diagnostic imaging is often inconclusive in cases of twisted ALLs, and laparoscopy seems the best method for a definitive diagnosis. Resection is advisable in cases of ALLs with infarction, preferably during laparoscopy as we have for the first time reported here in.

Diagnostic imaging is often inconclusive in cases of twisted ALLs, and laparoscopy seems the best method for a definitive diagnosis. Resection is advisable in cases of ALLs with infarction, preferably during laparoscopy as we have for the first time reported here I usually; the diagnosis is made after laparotomy by histopathological confirmation [9]. Diagnostic laparoscopy can also play a vital role in management of unusual causes of acute abdomen [10]. To date, there are 24 reported human cases of liver torsion. Most were in women and under age 65. Oldest reported case to date is in a 65 year old female, presenting with sudden rise in transaminases during the active process of liver torsion. CT and US findings of an accessory liver lobe may be helpful, but diagnosis of liver torsion remains a challenge. Prompt recognition and treatment of this condition is necessary to prevent subsequent morbidity and mortality [11].

Well described in animals [12,13], torsion of accessory liver lobe is rare in humans, especially in children. Few cases are reported in neonates and infants. Abnormality of the gross liver anatomy can occur in patients with an abdominal wall defect such as omphalocele. Therefore, torsion of accessory liver lobe should be suspected in any patient with previous repair of an abdominal wall defect who presents with unusual abdominal pain or shock.

Following torsion in accessory caudate lobe of the liver, acute blood flow loss of the organ will eventually lead to hypoxia and severe pain. Abdominal organs torsion will cause acute abdomen in this way. Caudate Lobe (CL) of the liver is derived from the right liver lobe anatomically on the inferior and posterior surface of liver; however, it's functionally separated from that [14].

Torsion of the fatty appendage of the falciform ligament is a rare condition that leads to severe abdominal pain and raised inflammatory markers. It can be recognized on ultrasound or CT scan. The pathophysiology is the same as that involved in the more common torsion and/or infarction of the greater omentum or appendix epiploicae [15]. The condition is best managed conservatively with anti-inflammatory analgesia. Early recognition of this type of torsion may prevent unnecessary operative intervention [16,17].

Hemangioma is the most common benign tumor of the liver. Most cases are asymptomatic and do not require treatment. A hemangioma can rarely be pedunculated; as a result, it may undergo torsion and infarction, which can make it symptomatic. Pedunculated hemangioma of the liver is a rare differential diagnosis for mass located in the upper abdomen. All incidentally detected pedunculated hemangioma must be surgically managed, as these have a tendency to become torsional, and there is also a risk of malignancy or rupture [18].

Conclusion

Left hepatic lobe torsion & infarction is an extremely rare cause of acute surgical abdomen. A high index of suspicion is required to deal un-usual abdominal presentations, using appropriate radiological and routine investigations. A prompt/timely surgical intervention can save the patient from further morbidity & mortality.

Statement of Ethics

The study was performed in accordance with the Helsinki Declaration and Good Clinical Practice.

Consent of the Patient

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Scare Checklist

This work is prepared in guidance with SCARE checklist.

References

1. Sherif R. Z. Abdel-M, Mark B. Liver anatomy. *Surg Clin North Am.* 2010;90(4):643-53.
2. Li XP, Xu DC, Tan HY, Li CL. Anatomical study on the morphology and blood supply of falciform ligament and its clinical significance. *Surg Radiol Anat.* 2004;26(2):106-9.
3. Choi JW, Kim TK, Kim KW, Kim AY, Kim PN, Ha HK, et al. Anatomic variation in intrahepatic bile ducts: an analysis of intraoperative cholangiograms in 300 consecutive donors for living donor liver transplantation. *Korean J Radiol.* 2003;4(2):85-90.
4. Heena JC, Minal K, Vasant H, Amul N. Morphological Study of Human Liver and Its Surgical Importance. *J ClinDiagn Res.* 2017;11(6):AC09-12.
5. Alexey P, Sergey Y, Elena C, Ainory P Gesase. Accessory lobes, accessory fissures and prominent papillary process of the liver. *Anatomy J Africa.* 2015;4(2):611-6.
6. Guglielmi A, Ruzzenente A, Conci S, Valdegamberi A, Iacono C. How much remnant is enough in liver resection? *Dig Surg.* 2012;29(1):6-17.
7. Holbert BL, Baron RL, Dodd GD 3rd. Hepatic infarction caused by arterial insufficiency: spectrum and evolution of CT findings. *AJR Am J Roentgenol.* 1996;166(4):815-20.

8. Ladurner R, Brandacher G, Mark W, Iannetti C, Lottersberger C, Steurer W. Complete hepatic ischemia due to torsion of a large accessory liver lobe: first case to require transplantation. *Transpl Int.* 2005;18(4):467-9.
9. Jambhekar K, Pandey T, Kaushik C, Shah HR. Intermittent torsion of accessory hepatic lobe: An unusual cause of recurrent right upper quadrant pain. *Indian J Radiol Imaging.* 2010;20(2):135-7.
10. Sommariva A, Pasquali S, Stramare R, Montesco MC, Tropea S, Rossi CR. Laparoscopic diagnosis and treatment of a twisted accessory liver lobe. *CR SLS.* e2014.00170.
11. Veronica B, Graham F, Barnard. Acute Liver Torsion: A Rare Case of Abdominal Pain and Elevated Liver Transaminases. Volume 144, May 2013 Issue 5, Supplement 1, Page S-913.
12. Michael G. Scheck. Liver lobe torsion in a dog. *Can Vet J.* 2007;48(4):423-5.
13. Wenger S, Barrett EL, Pearson GR, Sayers I, Blakey C, Redrobe S. Liver lobe torsion in three adult rabbits. *J Small Anim Pract.* 2009;50(6):301-5.
14. Ashjaei B, Noveiry B. Accessory caudate liver lobe torsion in a 7-year old boy: case report. *Austin Surg Case Rep.* 2017;2(2):1021.
15. Udechukwu NS, D'Souza RS, Abdulkareem A, Shogbesan O. Computed tomography diagnosis of omental infarction presenting as an acute abdomen. *Radiol Case Rep.* 2018;13(3):583-5.
16. Maccallum C, Eaton S, Chubb D, Franzi S. Torsion of fatty appendage of falciform ligament: acute abdomen in a child. *Case Rep Radiol.* 2015;2015:293491.
17. Indiran V, Dixit R, Maduraimuthu P. Unusual cause of epigastric pain: intra-abdominal focal fat infarction involving appendage of falciform ligament - case report and review of literature. *GE Port J Gastroenterol.* 2018;25(4):179-83.
18. Darzi A, Taheri H, Kamali Ahangar S, Mirzapour Shafiei A, Asghari Y. Torsion of a Giant Pedunculated Hemangioma of the Liver Presenting With Acute Abdomen: A Case Report. *Iran Red Crescent Med J.* 2016;18(8):e38198.