International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Aberrant Right Hepatic Artery Observed During an Elective Laparoscopic Cholecystectomy: A Case Report

Anil K Behera, Bikash Ranjan Mishra, Jagadeep Satapathy, Sujit K Mohanrty, Jayanta Kumar Biswal

Abstract: ***Knowledge of aberration in anatomy of hepatic artery is of utmost significance and very much Important in hepatobiliary surgeries as well as upper GI surgeries. Variations in anatomy of hepatic arteries is very commonly observed and reported to have a prevalence of 13% to as high as 48% (1). Normal hepatic arterial anatomy can be found only in 50% - 70% individuals (2). Such frequent incidence of variations in anatomy always requires changes in surgical techniques and also postoperative management. In absence of proper preoperative evaluation or intraoperative keen eye and presence of mind such aberrations are easy to miss with disastrous consequences such as unintentional hemorrhage or necrosis of a part or whole of liver or life threatening biliary complications. The most commonly employed classification for abnormal hepatic artery is by Michels and Hiatt (3) (4). These classification systems are landmarks in themselves but they do not consider anatomic course of hepatic artery and its topographic relation to adjacent structures. The aim of this case report is to bring out such an aberrantly long right hepatic artery with abnormal course to the public knowledge.***

Keywords: Right Hepatic Artery, Laparoscopy Cholecystectomy

1. Introduction

The common hepatic artery which is one of the three branches of celiac trunk gives rise to Proper Hepatic Artery (PHA). In most cases PHA gives rise to Right Hepatic Artery (RHA). RHA lies left of common bile duct. Before entering into Calot's triangle it runs upwards, to the right, gives branch to cystic artery near cystic duct, then courses upwards to enter the liver. Close to liver it divides to anterior division which supplies segment V and VIII and posterior division which supplies segment VI and VII (5).25% of blood and 50% of oxygen is provided to the liver by RHA (6). When the RHA doesn't origin from CHA or hepatic artery proper it arises from aorta or arteries like SMA, gastroduodenal artery, right gastric artery or celiac trunk and is termed as aberrant RHA.

If an aberrant artery supplies the right lobe of the liver, the right lobe also receives supply from the proper hepatic artery of normal origin it is known as an aberrant accessory RHA. If an aberrant RHA constitutes the sole blood supply to the right lobe of the liver it is known as an aberrant replacing right hepatic artery, since it replaces the normal RHA (7).

RHA is well known for its surgical and radiological importance. Hence absence of in - depth knowledge about RHA anatomy while performing open or laparoscopic hepatobiliary - pancreatic surgeries can cause unforeseen adverse events even by most experienced surgeon.

2. Case Presentation

A 42yr old female presented to surgery OPD with right upper quadrant pain abdomen which was sudden in onset and lasted only for few hours. She complains of similar episodes of pain abdomen in the past which relieved by themselves or by some over the counter medication over past 1yr. The patient was conscious, well oriented to time, place and person. Her PR was 68bpm and BP was 124 over 82 mm of Hg. She had no pallor, icterus, clubbing, cyanosis or oedema. When per abdominal examination was done the abdomen was found to be soft. Mild tenderness elicited at right hypochondrium near the vicinity of tip of 9^{th} costal cartilage. The patient was advised for an ultrasonography of abdomen and pelvis the report of which stated few calculi of average size 6 - 8mm in gall bladder casting posterior acoustic shadow. Liver Function Test of the patient was within normal limits. The patient was diagnosed as a case of Chronic calculous cholecystitis and planned for elective laparoscopic cholecystectomy.

After improving general condition of the patient she was posted for laparoscopic cholecystectomy. Pneumoperitoneum was achieved by inserting a veresse needle at infraumbilical region. Working ports, camera port and port for gb fundal traction secured. Under vision Calot's triangle dissection done and fat pads were separated from cystic duct and what was thought to be the cystic artery.

Further skeletonization of the vessel revealed its rather long course and non - termination in gallbladder which is rather unusual of cystic artery. Further fine dissection showed the artery coursing parallel to the gall bladder for approx.3 - 4cm then giving off a branch to the right almost on the body of gallbladder i. e. the cystic artery and then giving hepatic branches and terminating in right lobe of liver.

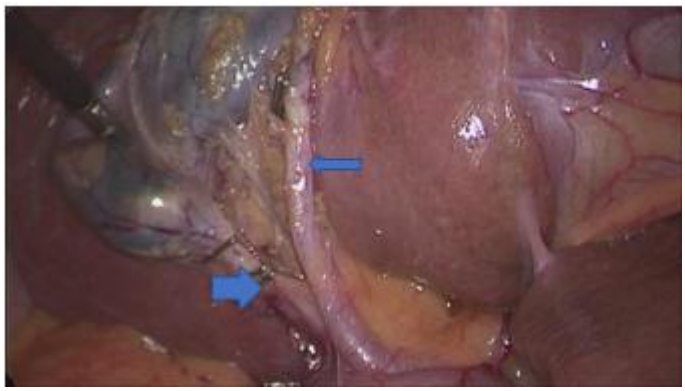

Figure 1: Arrowhead shows aberrantly long RHA and clamped cystic duct)

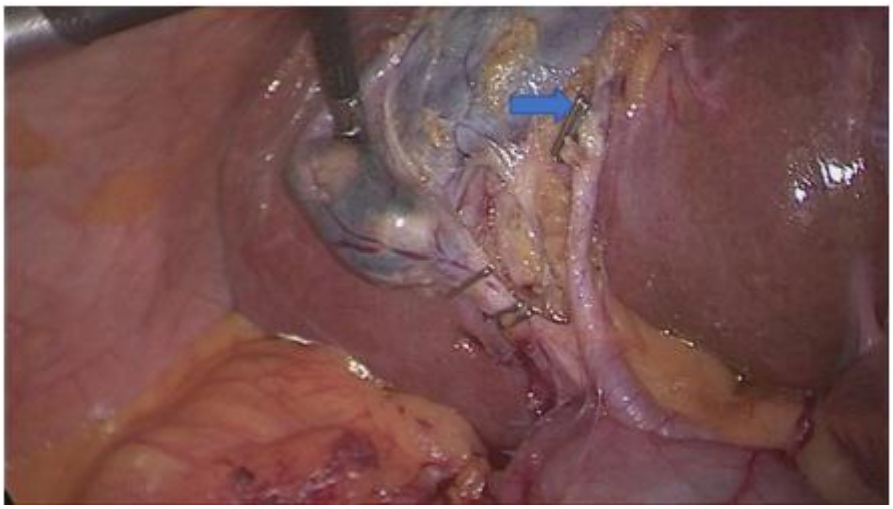

Figure 2: Arrowhead shows clamped cystic artery arising from aberrantly long RHA)

After identification of correct cystic artery it was clipped. Cystic duct clipped. Both duct and artery were divided maintaining proper hemostasis. Gallbladder dissected out from GB fossa and removed out after removing the stones from it with a sponge holding forceps. The resected gb specimen was sent for histopathological study.

The post - op period of the patient was uneventful. She was discharged on pod - 2 with oral medications.

3. Discussion

Ligation or clipping of an artery in Callot's triangle as commonly done in a routine laparoscopic cholecystectomy might have led to severe consequences of which hepatic lobe necrosis, unintended hemorrhageare a few to name. preoperatively imaging studies such as MDCT and DSA can be done to delineate course of hepatic arteries. DSA is superior to CT in depicting small sized arteries, whereas CT demonstrates strength in the evaluation of the vascular territory of artery, as well as topographic relations to the adjacent structures (8). Therefore, CT an DSA can play complimentary roles in the evaluation of hepatic arterial anatomy.

4. Conclusion

A proper pre - operative clinical and radiological evaluation, a cautious mind, a hawk - eye, and attention to details during surgery with precise and fine dissection during operative procedures can always prevent disasters to happen as well as bring interesting subjects to public knowledge. Preoperative arterial imaging in hepato - biliary - pancreatic surgeries to prevent arterial injury during surgical procedures should be followed as a standard procedure.

References

[1] Koops A, Wojciechowski B, Broering DC, Adam G, KrupskiBerdien G. Anatomic variations of the hepatic arteries in 604 selective celiac and superior mesenteric angiographies. Surg RadiolAnat 2004; 26 (3): 239–244
[2] Replaced right hepatic artery passing anterior to pancreas: a rare and challenging anatomical variant during pancreatic oduodenectomy D. Raghavendra*, T. G. Balachandar, R. Prabhakaran, Sudeepta Kumar Swain, J. Nirmal, N. Sunil and Himanshu Shekhar
[3] Hiatt JR, Gabbay J, Busuttil RW. Surgical anatomy of the hepatic arteries in 1000 cases. Ann Surg 1994; 220 (1): 50–52
[4] Michels NA. Newer anatomy of the liver and its variant blood supply and collateral circulation. Am J Surg 1966; 112 (3): 337–347
[5] Standring, S. (2008). Gray's Anatomy (40th ed.). Edinburgh London: Churchill Livingstone
[6] Skandalakis, J. E. (2004). Skandalakis' Surgical Anatomy: The Embryologic and Anatomic Basis of Modern Surgery II. Athens, Greece: Paschalidis Medical Publication

[7] Michels NA. Blood supply and anatomy of the upper abdominal organs with a descriptive atlas. Philadelphia and Montreal, B. Lippincott Company.1955; 134– 83
[8] Löschner C, Nagel SN, Kausche S, Teichgräber U. Hepatic arterial supply in 1297 CT - angiographies. Rofo 2015; 187 (4): 276–282