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CASE REPORT

MOYNIHAN'S HUMP AN UNUSUAL VARIANT OF THE RIGHT HEPATIC ARTERY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Introduction: Moynihan's hump, also known as the "caterpillar turn," is a rare variation of the right hepatic artery associated with the shorter cystic artery and have a looping route. This anomaly is clinically significant, especially during gallbladder surgeries like laparoscopic cholecystectomy, as it increases the risk of vascular injury. It ranges from 1% to 13%, and if unnoticed, may have serious consequences.

Case Presentation: A 49-year-old female patient with chronic calculus cholecystitis had planned for laparoscopic cholecystectomy. A tortuous right hepatic artery was discovered during the procedure near the cystic duct and gallbladder neck which made the dissection difficult.

Clinical Discussion: Moynihan's hump, which is defined by an abnormal anatomy of the right hepatic and cystic arteries, might present serious difficulties during cholecystectomy. If this anatomical variance is accidentally disrupted, it may result in serious problems such hepatic ischemia, biliary fistulas, or bleeding. To prevent such problems, surgeons need to be very careful when differentiating between cystic artery and right hepatic artery. It is essential to comprehend this anatomical anomaly in order to execute procedures that are safer and more successful.

Conclusion: A patient with an unusually "short cystic artery" or " wide cystic artery " is likely to have a "Moynihans hump". The caterpillar turn of the right hepatic artery is subject to rare anatomical variations in its course that increase the risk of incorrect vessel ligation or injury during laparoscopic cholecystectomy.

Keywords: *laparoscopic cholecystectomy, right hepatic artery, cystic artery ,Moynihan's hump, caterpillar turn*

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1. Introduction

The right hepatic artery (RHA) is rarely found in a complex variant like Moynihan's hump, sometimes referred to as the "caterpillar turn," [1]. Figure 1 this variation is seen in laparoscopic gall bladder surgeries. This variant is particularly significant in laparoscopic cholecystectomy, where its proximity to the cystic duct and gallbladder increases the risk of vascular injury [2]. This anatomical variant presents a relative rarity with the potential to seriously impair surgical results, occurring in between 1% and 13% of cholecystectomy patients. An increased risk of unintentional injury to hepatic artery arises from Moynihan's hump [3].

In anatomy, the right hepatic artery lies posterior to the bile duct, branching from the common hepatic artery and supplying the right liver lobe. However, in cases of Moynihan's hump, the artery deviates into a tortuous course that brings it much closer to the gallbladder neck and cystic structures [4].

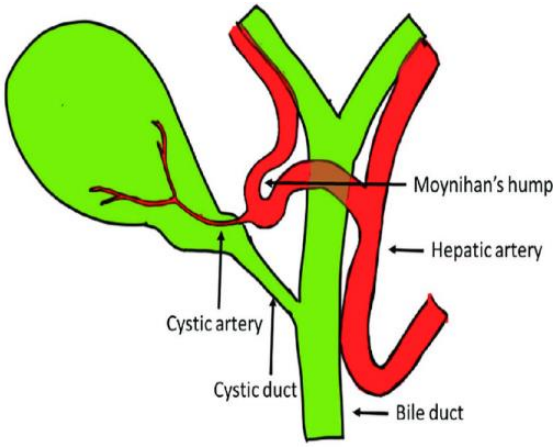

Fig 1: Moynihan's Hump

The cystic artery supplies the gallbladder. Yet, the RHA may loop around the cystic duct or other structures due to the aberrant architecture seen in Moynihan's hump, frequently taking up a maximum portion of Calot's triangle [5]. Because of this, it may be challenging to distinguish the cystic artery from hepatic artery. If this is not done correctly, concerns could arise that could result in haemorrhage, bile leakage, ischemia of the liver or common bile duct injury [6].

Because Moynihan's hump is present, the surgeon must take extra caution during laparoscopic cholecystectomy, a procedure where accuracy is essential. With this anatomical variance, the surgery becomes more challenging [7]. With the rise of minimally invasive surgeries, especially laparoscopic techniques, awareness of vascular anomalies like Moynihan's hump is vital [8] Preoperative imaging and meticulous intraoperative dissection are key to managing this variant safely, ensuring that surgeons can perform the procedure while minimizing the risk of injury to critical vascular structures.

2. Case Presentation

A 49-year-old female patient was planned laparoscopic cholecystectomy diagnosed with chronic calculus cholecystitis. Clinically presented with pain in abdomen since 6 months and associated with loss of appetite. Also had complaints of hard stools. She was a known case of type 2 Diabetic Mellitus and hypertension on regular medication. On clinical examination tenderness was present in right hypocondrium with Murphy's sign positive. Pre operative work up was done and patient underwent laparoscopic cholecystectomy. The hepatocystic triangle, which includes the cystic duct and cystic artery, is revealed during laparoscopic cholecystectomy by retracting the gallbladder. We proceeded with the hepatocystic triangle dissection in anticipation of discovering the typical entrance of two structures to the gallbladder. However, an anatomical variation corresponded to the RHA and was observed as a caterpillar-shaped loop within Calot's triangle, anterior to the cystic duct. A single, relatively short Cystic Artery, unlike its usual location, supplied irrigation to the gallbladder. Additionally, Moynihan's hump was identified.[9]. This peculiar configuration of the RHA occupied significant area of Calot's triangle, which posed a challenge for the dissection of neighbouring structures (Figure 2: Moynihan's hump noticed in laparoscopic cholecystectomy) [10].

Fig 2: Moynihan's hump noticed in Laparoscopic Cholecystectomy

LN- lymph node of lund, CA cystic artery, MH moynihan's hump, CD cystic duct

In order to provide a safe cholecystectomy, we followed the parameters outlined in the "Critical View of Safety" document. This included accurately identifying the structures and executing the ligation close to the gallbladder to avoid accidentally injuring the RHA [11]. The surgical team proceeded with great care as they carefully excised and severed the cystic duct, starting near the gallbladder.[12]. Then cystic artery was ligated and transected in order to reduce the possibility of injury to right hepatic artery [13].

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Fig 3: Moynihan's hump noticed in Laparoscopic Cholecystectomy

The gallbladder was successfully removed from its bed in the liver, despite the difficulties caused by the intricate architecture [14]. Haemostasis was achieved, drain was placed and closure was done. A seamless surgical procedure was evident from the fact that the entire procedure took 2 hours and 32 minutes to complete and that there was minimal blood loss. The patient tolerated the procedure well and post operative period was uneventful. Drain output was minimal and Drain was removed after 24 hrs. On Post operative day 3 she was discharged. This emphasizes how crucial it is to identify and accommodate such variances in order to achieve successful surgical outcomes.

3. Discussion

Three major factors contribute to the complexity of the biliary tree, cystic artery, and RHA anatomy, which together form the hepatobiliary triangle: (1) the proximity of several critical structures (the bile duct, the hepatic artery, and the portal vein) to one another; (2) the presence of numerous anatomical variations within these three structures; and (3) the frequency with which these variations occur. Variations ranging from 20% to 50% are not uncommon.Citations [14–18] Figure 3 shows Moynihan's hump, an anatomical variant of the right hepatic artery that is uncommon yet clinically significant [15]. Its characteristic tortuosity and close proximity to the cystic duct and gallbladder make it a critical structure to identify during hepatobiliary surgeries, particularly laparoscopic cholecystectomy. Failure to recognize this variant can result in serious complications, including inadvertent vascular injury, bile duct damage, or haemorrhage.

Moynihan's hump can cause unintentional injury that can result in One of the most serious problems that is hepatic ischemia, which occurs when the RHA is damaged. This can have a serious effect on the patient's outcome by causing liver ischemia, necrosis, or abscesses. Additionally, there is an increased risk of developing biliary fistulas, which are improper connections between the bile ducts and other organs that may result in bile duct stenosis or cholangitis. Hemorrhage is another serious complication for RHA injuries. It can cause significant bleeding and may need to switch to an open surgical approach in order to control the situation [16].

Surgeons must possess a thorough awareness of Moynihan's hump and its implications for cholecystectomy in order to reduce these risks. Making better decisions during surgery and preoperative preparation is made possible by the recognition of this anatomical aberration [17].

In such situations, cystic duct should be dissected and ligated first and then the cystic artery to avoid cystic artery tear and enhance surgical results, consequently providing patient safety and procedure effectiveness.

Therefore, in order to ensure a safe surgery, it is imperative that we adhere to the safety protocols laid down by Strasberg. The foremost of these protocols states that before to any gallbladder ligation or cutting, we must be able to see precisely two structures.[18-19]

Preoperative imaging may aid in the identification of this vascular anomaly, although its detection can sometimes be difficult, even with advanced techniques like CT angiography. Therefore, intraoperative vigilance is essential. Surgeons must exercise caution, and in complex cases where the anatomy is unclear, strategies such as a "critical view of safety" technique may be employed to avoid accidental injury to the artery. Surgeons must remain vigilant in the presence of anatomical variants like Moynihan's hump to reduce morbidity [20-21]. Proper preoperative planning, intraoperative awareness, and technique modifications ensure that the risks associated with this variation are mitigated, contributing to safer surgical outcomes.

4. Conclusion

Moynihan's hump, an unusual variant of the right hepatic artery, underscores the importance of anatomical awareness in hepatobiliary surgery. The case study demonstrates greater surgical accuracy and attention to detail in order to identify biliary and vascular structures. When an exceptionally short cystic artery is observed, the existence of moynihan's hump should be considered.

5. References

1. Pérez, J. A. M., Rodríguez, J. A. D., Cruz, I. D. A., Valdés, A. J. L., Baltazar, A. L. S., & Lozada, L. P. (2021). Moynihan's Lump as an unusual variant of right hepatic artery during a laparoscopic cholecystectomy approach. A case report. *International journal of surgery case reports*, *85*, 106221.
2. Asghar, A., Priya, A., Patra, A., Gupta, P., & Kumar, A. (2023). Moynihan's hump of the right hepatic artery in Calot's triangle: a systematic review and meta-analysis of its incidence and surgical importance. *Surgical and Radiologic Anatomy*, *45*(5), 643-651.
3. Uhe, I., Ghyasi, A. G., Chevallay, M., & Cherbanyk, F. (2022). A 56-year-old woman with acute cholecystitis and a Moynihan's hump, or caterpillar configuration, of the right hepatic artery identified during laparoscopic cholecystectomy. *The American Journal of Case Reports*, *23*, e936835-1.

ISSN:2320-3714
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4. Kamath, B. K. (2016). An anatomical study of Moynihan's hump of right hepatic artery and its surgical importance. *Journal of the Anatomical Society of India*, *65*, S65-S67.
5. Gulbani, L., Jariwala, D., Goderdzishvili, V., Kherodinashvili, G., & Kordzaia, D. (2023). Moynihan's Hump: A Rare Anatomical Variation of the Right Hepatic Artery Encountered During Laparoscopic Cholecystectomy. *Translational and Clinical Medicine-Georgian Medical Journal*, *8*(1), 87-89.
6. Raghuwanshi, D. S., Ram, M., Khan, S., & Anand, K. (2021). Moynihan's hump: our eyes see what our mind knows. *Indian Journal of Surgery*, *83*, 1077-1078.
7. Alshahri, T. M., Ibrahim, M., & Hammami, D. (2023). Variant of Right Hepatic Artery During a Laparoscopic Cholecystectomy Approach. *Emerging Medical Science*, *2*(01), 55-57.
8. Singh, S., Sharma, R., & Singh, S. (2023). Moynihan's Hump-Dreadful Hepatic Artery Variation in Laparoscopic Cholecystectom. *Asian J. Case Rep. Surg*, *6*(1), 275-278.
9. Giuvărășteanu, I., Stoica, C., & Stănescu, C. (2015). HEPATIC ARTERY VARIATIONS AND THEIR IMPORTANCE IN HEPATOBILIARY SURGERY. *Romanian Journal of Functional & Clinical, Macro & Microscopical Anatomy & of Anthropology/Revista Româna de Anatomie Functionala si Clinica, Macro si Microscopica si de Antropologie*, *14*(3).
10. Mishall, P. L., & Rajgopal, L. (2010). Variant right hepatic artery forming Moynihan's hump–clinical relevance. *Int J Anat Var*, *3*, 144-145.
11. Sah, N. P., Sah, S. P., Khaniya, S., Awale, L., Shah, R. P., Agarwal, C. S., & Adhikary, S. (2018). Extrahepatic biliary anatomy variation encountered during laparoscopic cholecystectomy. *Hypertension*, *41*, 12-23.
12. Rahate, P. (2023). Anatomical classification of catterpillar hump of RHA and its surgical importance (nagpur classifica-tion). *J Clin Med Img Case Rep*, *3*(2), 1429.
13. Marano L, Bartoli A, Polom K, et al. The unwanted third wheel in the calot's triangle: Incidence and surgical significance of caterpillar hump of right hepatic artery with a systematic review of the literature. J Min Access Surg 2019;15:185–191.
14. Tolino MJ, Tartaglione AS, Sturletti CD, et al. Variedades Anatómicas del Árbol Biliar: Implicancia Quirúrgica. Int J Morphol 2010; 28(4):1235–1240.
15. Ding YM, Wang B, Wang WX, et al. New classification of the anatomic variations of cystic artery during laparoscopic cholecystectomy. World J Gastroenterol 2007;13(42):5629–5634.
16. 16 Benson EA, Page RE. A practical reappraisal of the anatomy of the extrahepatic bile ducts and arteries. Br J Surg 1976;63(11):853–860.
17. Cimmino PT, Bocchetti T, Izzo L. Rilievi anatomo-chirurgici per la colecistectomia per via laparoscopica [Anatomo-surgical considerations in laparoscopic cholecystectomy]. G Chir 1992;13(4):149–151.
18. S.M. Strasberg, L.M. Brunt, Rationale and use of the critical view of safety in laparoscopic cholecystectomy, J. Am. Coll. Surg. 211 (1) (2010) 132–138
19. Jansirani, D., Mugunthan, N., Phalgunan, V., & Shiva, S. (2012). Caterpillar hump of right hepatic artery: incidence and surgical significance. *National Journal of Clinical Anatomy*, *1*(3), 121-124.
20. Marano, L., Bartoli, A., Polom, K., Bellochi, R., Spaziani, A., & Castagnoli, G. (2019). The unwanted third wheel in the Calot's triangle: Incidence and surgical significance of caterpillar hump of right hepatic artery with a systematic review of the literature. *Journal of minimal access surgery*, *15*(3), 185-191.
21. KK, B. (2015). Dual Cystic Arteries in Association with Caterpillar Hump of Right Hepatic Artery-A Case Report and its Surgical Relevance. *Journal of Clinical and Diagnostic Research: JCDR*, *9*(7), AD01-2.

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