

Successful surgical management of hepatic artery injury during cholecystectomy

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ABSTRACT

Iatrogenic hepatic artery injury during cholecystectomy is a serious complication, often exacerbated by inflammation and anatomical variations of the vascular structures. In this article, a 16-year-old female patient undergoing laparoscopic cholecystectomy for cholecystitis sustained a hepatic artery injury. The cardiovascular surgery team performed an interposition graft using the saphenous vein to restore arterial flow. Systemic heparinization was administered intravenously at a dose of 100 IU/kg before vascular clamping. Hemostasis was achieved through temporary clamping of the celiac trunk branches. Contrast-enhanced computed tomography angiography on postoperative Day 5 confirmed the patency of the graft. In conclusion, in cases where bile duct and hepatic artery injuries occur simultaneously, a multidisciplinary approach is of utmost importance to improve patient outcomes and minimize complications.

Keywords: Cholecystectomy, hepatic artery, pediatric vascular injury, saphenous vein graft.

Iatrogenic injury to the hepatic arteries during cholecystectomy is a significant and potentially life-threatening complication.^[1] Inflammatory changes in the hepatobiliary region and anatomical variations in vascular structures can complicate surgical dissection, thereby increasing the risk of such injuries. The incidence of combined injury to the extrahepatic bile ducts and hepatic afferent vessels has been reported to be approximately 30%, which can severely compromise the patient's overall clinical condition.^[1] Bile duct injury during cholecystectomy still remains a serious and potentially fatal complication.^[1]

Over the past two decades, studies have reported that the incidence of complications associated with laparoscopic cholecystectomy ranges from 0.5 to 1.4%.^[1] Concomitant injury to hepatic vessels and bile ducts significantly increases patient mortality.^[2-4] Clinical studies have shown the incidence of combined extrahepatic bile duct and hepatic artery injuries during cholecystectomy ranging from 13.8 to 26%.^[3,5] Due to limited experience in some centers, standardized treatment strategies for managing such complex cases have not been fully established. In this article, we present a case of successful surgical management

of a hepatic artery injury sustained during cholecystectomy.

CASE REPORT

A 16-year-old female patient with a known history of symptomatic cholelithiasis presented to the emergency department with nausea, right upper quadrant pain radiating to the shoulder, fever, chills, and generalized fatigue. On admission, the body temperature was 38.5°C. Laboratory tests showed elevated inflammatory markers including C-reactive protein (CRP) 98 mg/L, amylase 44 U/L, and lipase: 26 U/L. Abdominal ultrasonography revealed gallbladder wall thickening and multiple stones consistent with acute cholecystitis. The patient was admitted to the pediatric surgery service and

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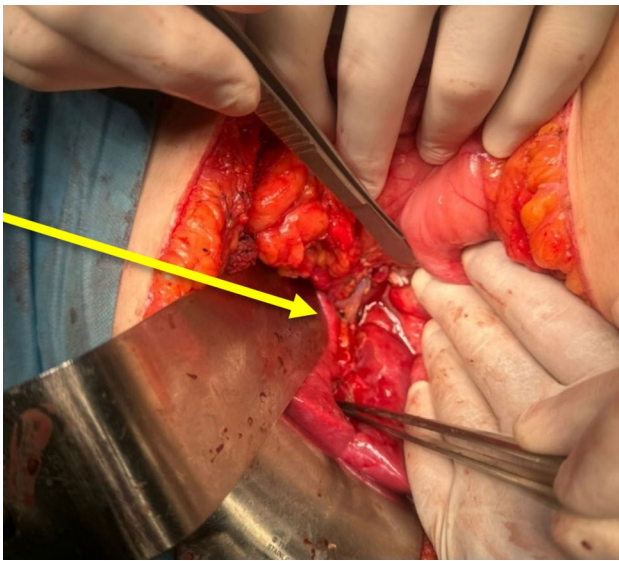


Figure 1. Intraoperative image showing hepatic artery repair with saphenous vein interposition graft. The saphenous vein graft is visible between the proximal and distal hepatic artery segments (yellow arrow).

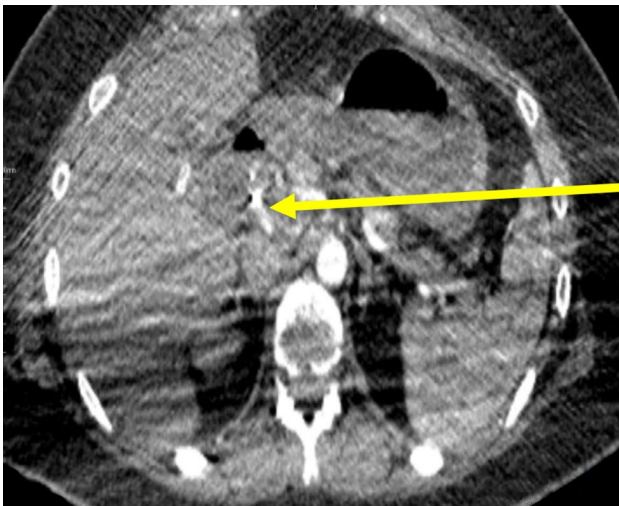


Figure 2. Postoperative computed tomography angiography showing patent saphenous vein graft on postoperative day 5. Yellow arrow indicates the course of the graft and confirms arterial continuity without thrombosis (yellow arrow).

scheduled for elective laparoscopic cholecystectomy following stabilization.

During the laparoscopic procedure, significant arterial bleeding was encountered in the hepatobiliary region, which could not be adequately controlled using minimally invasive methods. Due to impaired visualization and the need for

vascular repair, the procedure was converted to open cholecystectomy. Intraoperative findings prompted an urgent consultation with the cardiovascular surgery team. Hemostasis was initially achieved by temporary vascular clamping of the celiac trunk branches using atraumatic vascular clamps. Further exploration revealed a full-thickness transection of the proper hepatic artery. Systemic anticoagulation was initiated with intravenous heparin at a dose of 100 IU/kg prior to vascular repair.

A saphenous vein graft was harvested from the lower extremity, and an interposition graft was performed to restore arterial continuity (Figure 1). Concurrently, due to the associated bile duct injury, the general surgery team performed a Roux-en-Y hepaticojejunostomy for biliary reconstruction. The patient was transferred to the pediatric intensive care unit postoperatively. Recovery was uneventful, and no inotropic support was required.

Liver function tests including aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma-glutamyl transferase (GGT) along with bilirubin levels, gradually returned to normal. To protect the vascular graft, low molecular weight heparin therapy was initiated. On postoperative Day 5, contrast-enhanced computed tomography angiography confirmed the patency of the hepatic artery and adequate graft perfusion (Figure 2). The patient was discharged in stable condition after full clinical and biochemical recovery. A written informed consent was obtained from the parents and/or legal guardians of the patient.

DISCUSSION

Hepatic artery injuries during laparoscopic cholecystectomy are rare, but potentially life-threatening complications, particularly in the presence of inflammation, anatomical variations, or surgical inexperience. In our case, conversion to open surgery was essential for adequate exploration and vascular control. This approach allowed for prompt identification and successful repair of the hepatic artery using a saphenous vein interposition graft.

Although some studies have suggested that isolated hepatic artery injuries may not require revascularization due to intrahepatic collateral flow,^[1] this may not apply to pediatric patients, whose collateral networks are often underdeveloped.

In such cases, prompt surgical intervention is necessary to prevent ischemia-related liver damage.

This case is particularly notable due to the patient's young age and the successful use of a saphenous vein graft for arterial reconstruction. While most hepatic artery injuries occur in adults, pediatric cases are extremely rare. A recent report by Akış et al.^[3] described a six-year-old child with a similar vascular injury during laparoscopic cholecystectomy, highlighting both the rarity and the technical complexity of such cases in children. Ferrada et al.^[4] also emphasized that combined biliary and vascular injuries could necessitate aggressive interventions such as percutaneous revascularization or staged hepatectomy. However, early recognition and immediate surgical repair can help avoid more extensive hepatic resections.

Although Singla et al.^[1] reported that injuries to the right hepatic artery might not significantly affect mortality due to collateral circulation, this cannot be generalizable to all pediatric patients. Therefore, early revascularization should be prioritized in children. Furthermore, existing literature supports the feasibility and durability of saphenous vein grafts in emergency hepatic artery reconstruction.^[2,5] In our case, the uneventful postoperative course and the documented graft patency on imaging support this approach.

In conclusion, hepatic artery injury in pediatric patients, although rare, requires prompt recognition and coordinated management. Saphenous vein interposition grafting can be an effective method to restore arterial continuity when performed early and in conjunction with definitive biliary repair. This case highlights the importance of multidisciplinary collaboration in achieving

favorable outcomes in complex hepatobiliary injuries.

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Author Contributions: The authors were responsible for conceptualization, data collection, analysis, and manuscript writing

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REFERENCES

1. Singla S, Singh RK, Kumar S, Prasad U, Mandal M, Kumar S. Cholecystectomy associated vasculobiliary injuries: Incidence and impact on surgical repair outcomes. *Turk J Surg* 2025;41:24-30. doi: 10.47717/turkjsurg.2025.6577.
2. Felekouras E, Megas T, Michail OP, Papaconstantinou I, Nikiteas N, Dimitroulis D, et al. Emergency liver resection for combined biliary and vascular injury following laparoscopic cholecystectomy: Case report and review of the literature. *South Med J* 2007;100:317-20. doi: 10.1097/01.smj.0000242793.15923.1a.
3. Akış Yıldız Z, Su ŞM, İlçe Z. Hepatic artery injury in a six-year-old patient after laparoscopic cholecystectomy: A management challenge. *J Surg Med* 2024;8:123-7.
4. Ferrada PISM, Morales HFL, Abarca JAS, Muñoz PIF. Major biliovascular injury associated with cholecystectomy with the need for percutaneous arterial revascularization and staged right hepatectomy: Case report. *Arq Bras Cir Dig* 2020;33:e1493. doi: 10.1590/0102-672020190001e1493.
5. Khanmoradi K, Defaria W, Moore RE, Guarneri R, Tzakis AG. Gastroduodenal artery as the inflow tract to repair the right hepatic artery in a combined vasculobiliary injury after laparoscopic cholecystectomy. *Am Surg* 2007;73:888-9.