



## Case report

# The hidden threat of uncontrollable bleeding from the gallbladder bed during laparoscopic cholecystectomy

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## ABSTRACT

**Introduction and importance:** Laparoscopic cholecystectomy is the treatment for symptomatic gallstone disease. However, a potential complication during this procedure is intraoperative bleeding resulting from vascular injuries, affecting around 0.9–1.9 % of cases. The most common bleeding site is the gallbladder bed, predominantly due to bleeding from the middle hepatic vein and its major branches.

**Case presentation:** This article presents an illustrative case of a superficial middle hepatic vein encountered during cholecystectomy during a donor hepatectomy.

**Clinical discussion:** Safe dissection of the Calot triangle is crucial in cholecystectomy to prevent bile duct injuries. Attention is drawn to the proximity of middle hepatic vein to the gallbladder bed during dissection, which can lead to complication. Recent studies highlight significant anatomical variations, emphasizing the need for caution, especially in the patients with specific conditions.

**Conclusion:** The careful surgical technique and awareness of anatomical variations, particularly regarding the proximity of the middle hepatic vein to the gallbladder bed during laparoscopic cholecystectomy. Surgeons are cautioned to maintain the focus throughout the procedure, even after achieving the critical view of safety. Preoperative evaluation of this anatomy with USS Venous Doppler and CT scan is minimize the risk of complications.

## 1. Introduction

Laparoscopic cholecystectomy is a commonly performed surgical procedure globally, with its safety focused on avoiding biliary, vascular, and hollow viscus injuries [1]. However, intraoperative uncontrollable bleeding due to vascular injury occurs in approximately 0.9–1.9 % of cases. The gallbladder bed is the primary bleeding site, mainly from the middle hepatic vein and its major branches [2]. Herein, we present a case depicting a middle hepatic vein found superficially in the gallbladder bed.

This case report has been reported in line with the SCARE criteria [5].

## 2. Case presentation

The patient, a 31-year-old female, volunteered as a liver donor for her one-year-old daughter. During the cholecystectomy, the surgeon observed the presence of the middle hepatic vein on the surface of the

gallbladder bed (Fig. 1, indicated by the blue arrow). Careful dissection of the gallbladder from the liver bed was performed, and liver resection was completed without complications (Fig. 2).

## 3. Discussion

Great attention has been given to the safe dissection of the Calot triangle and the prevention of bile duct injuries. During the gallbladder dissection from the liver bed, the surgeon may have some reassurance and lose the initial focus. It is crucial to recognise that the middle hepatic vein often runs close to the gallbladder fossa and may follow a superficial course at times.

Recent studies on the anatomy of the middle hepatic vein related to the liver bed have revealed that approximately 10–15 % of cases exhibit a large branch of the middle hepatic vein adhering to the gallbladder fossa, while 6–15 % of patients possess a large-sized vein within 1 mm distance from the gallbladder bed [4]. These individuals are more susceptible to damage and bleeding during cystic plate dissection,

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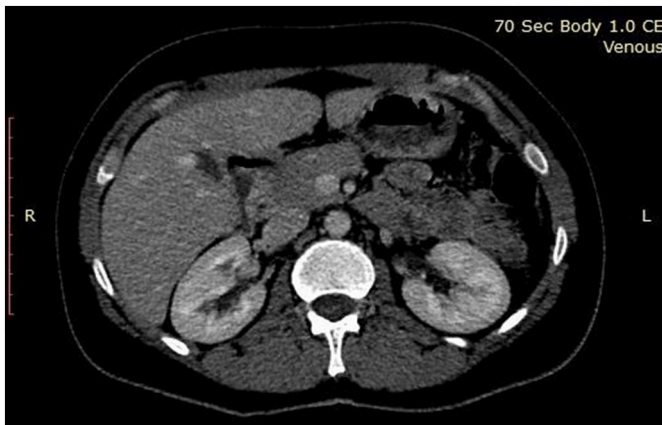
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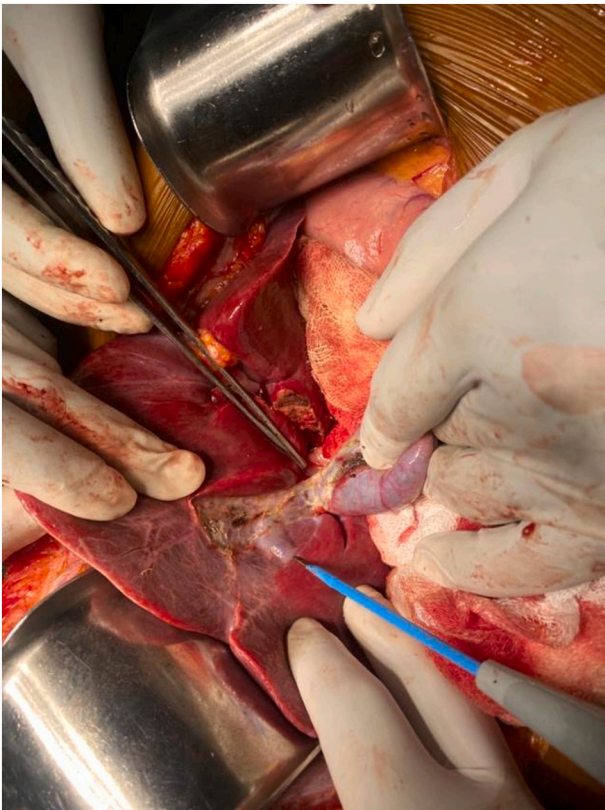
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**Fig. 1.** MHV (blue arrow)-axial image from CECT. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



**Fig. 2.** Intraoperative image of MHV on the surface of the gallbladder.

particularly those with chronic cholecystitis, contracted gallbladder, and cirrhotic liver.

To prevent vascular complications during cystic plate dissection, it is

crucial to exercise caution even after dissecting the hepatocystic triangle and confirming the critical view of safety. Preoperative evaluation of the middle hepatic vein and gallbladder bed anatomy can be facilitated using USS Venous Doppler and CT scan studies. [2,3]

#### CRediT authorship contribution statement

Study concept – G. Rajeeth, S.Tilakaratne.

Data collection – G. Rajeeth.

Interpretation - G. Rajeeth, S. Tilakaratne, R.C. Siriwardana.

Manuscript preparing – G. Rajeeth, S. Tilakaratne, R.C. Siriwardana.

#### Ethical approval

Ethical Review Committee of Teaching Hospital, Kelaniya does not require ethical approval for reporting individual cases or case series.

#### Consent

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

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#### Registration of research studies

N/A

#### Guarantor

Gnanakanesh Rajeeth.

#### Declaration of competing interest

The authors have no competing interests.

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