

Portal Vein Thrombosis As a Complication of Laparoscopic Sleeve Gastrectomy

Collin Aupied¹, Brett Haaga¹, Kayle Freidman⁵, Peyton Hopkins MD², Catherine Hudson MD⁴, Micheal Cook MD³, Hector Ferral MD²

¹Louisiana State University Health Science Center New Orleans School of Medicine

²Louisiana State University Health Sciences Center, Department of Interventional Radiology

³ Louisiana State University Health Sciences Center, Department of Surgery

⁴ Louisiana State University Health Sciences Center, Section of Gastroenterology

⁵ University Medical Center New Orleans, Department of Radiology



Introduction

Portal vein thrombosis (PVT) is an uncommon complication after Laparoscopic Bariatric Surgery (LBS). Portal vein thrombosis (PVT) affects about 0.1-2% of patients following surgery with up to 40% morbidity. This is higher than the rate of PVT in other abdominal procedures. The mechanism is poorly understood. Pre-procedure risk factors of PVT following LBS include history of liver disease, underlying coagulopathy use of oral contraceptives, and comorbidities associated with morbid obesity. This study aims to evaluate pre- and postoperative changes in portal, splenic, and mesenteric venous blood flow in patients undergoing LBS. The goal of this project is to try to identify risk factors for development of portal vein thrombosis after gastric sleeve or gastric bypass in morbidly obese patients.

Methods

This is a prospective pilot study enrolling patients over the age of 18 undergoing LBS at a large urban tertiary care hospital in Louisiana. Each participant will undergo ultrasound assessment at three timepoints.

The standardized protocol is as follows:

1. Perform US assessment within a week before surgery (gastric sleeve or bypass).
2. Patient needs to be NPO
3. Duplex ultrasound evaluation of portal vein, superior mesenteric vein and splenic vein flow velocity and diameter during normal respiration and during breath-hold. Velocities are stored in cm/sec.
4. The same protocol is repeated the day after surgery, before patient's discharge, and 6 weeks after surgery

Results

Data Collection is ongoing. Primary outcome variables include changes in vessel diameter and flow velocity across the portal, splenic, and mesenteric veins. Additional clinical data collected include demographics, BMI, surgical duration, length of hospital stay, postoperative complications, and comorbidities such as liver disease, hypercoagulable states, and malignancy.

Conclusion

While data collection is still ongoing, the goal of this project is to identify pre and post operative risk factors for morbidly obese patients to develop portal vein thrombosis from laparoscopic sleeve gastrectomy as well as possible treatments. We currently have eight patients enrolled that have had ultrasounds before and after bariatric surgery using the described protocol.

Case 1

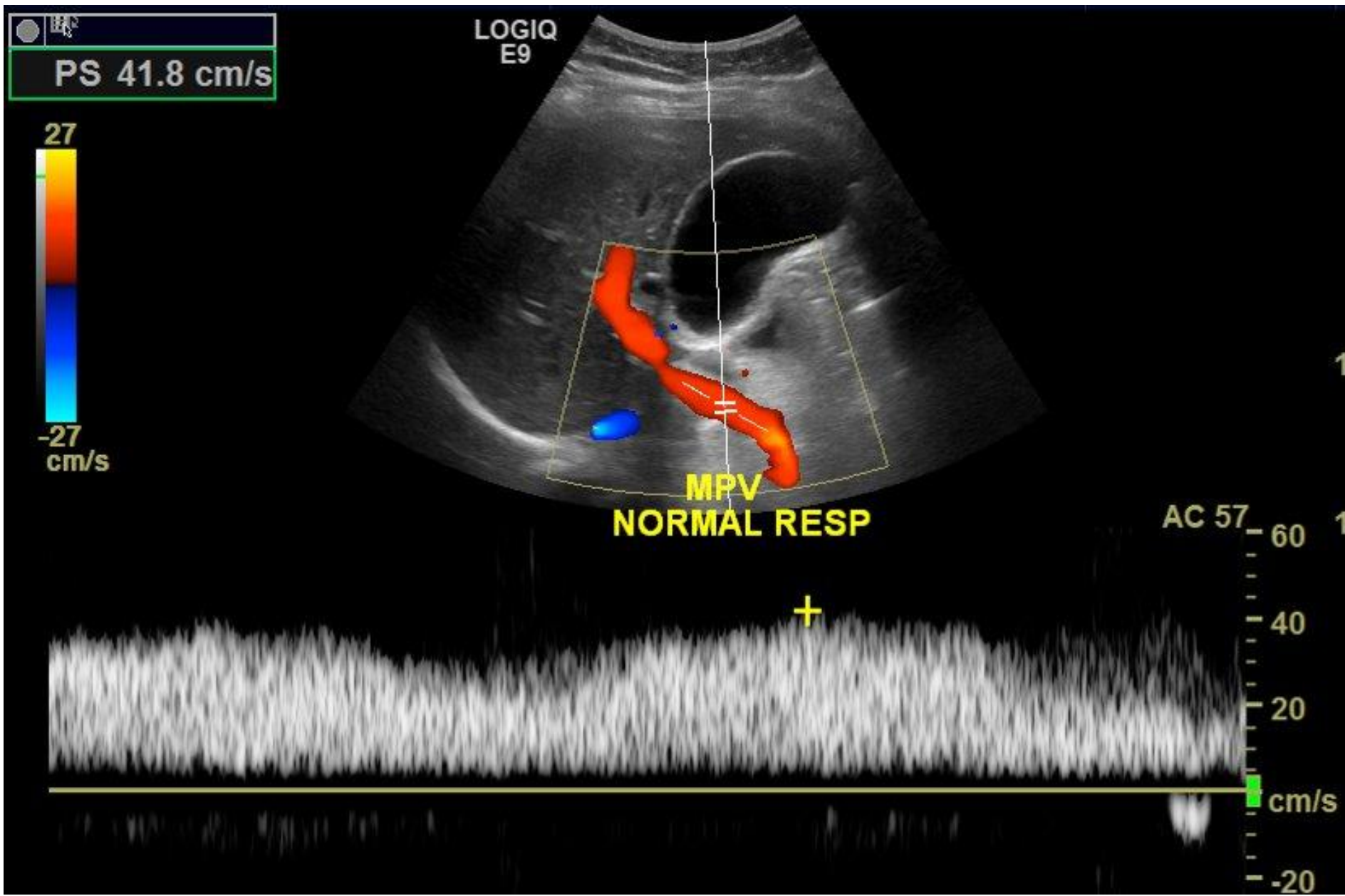


Fig 1. Ultrasound showing patent portal vein in a morbidly obese patient prior to laparoscopic sleeve gastrectomy

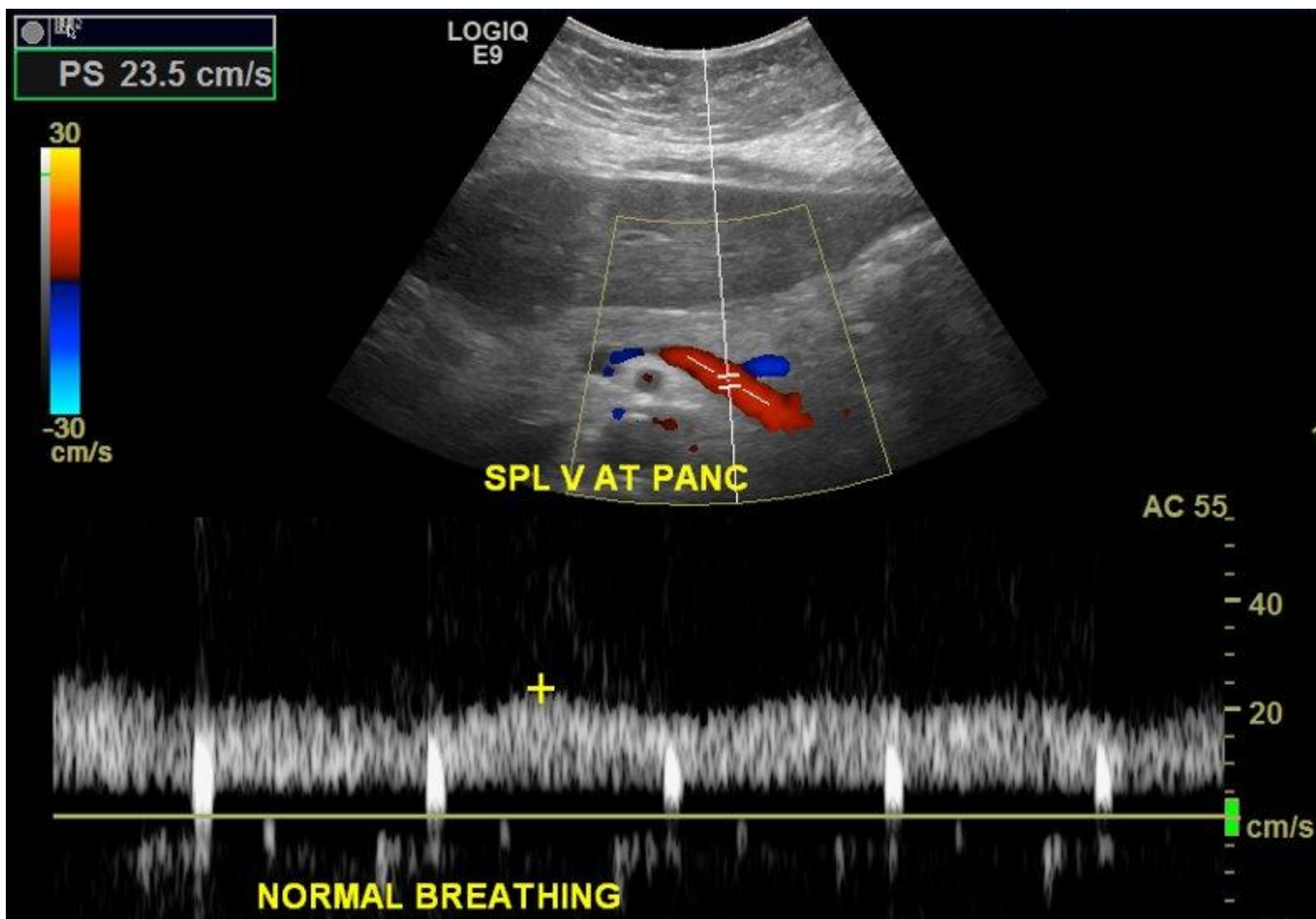
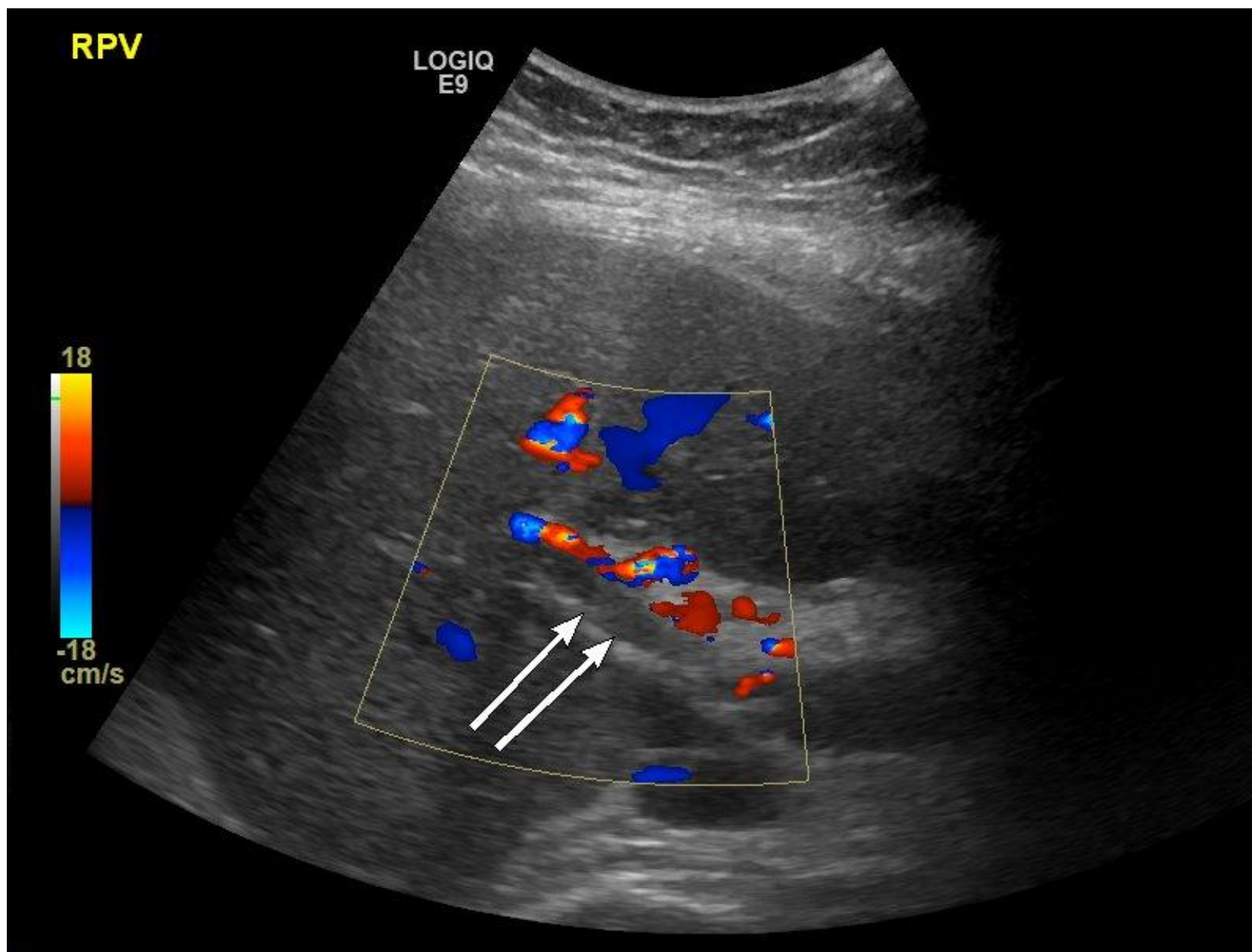
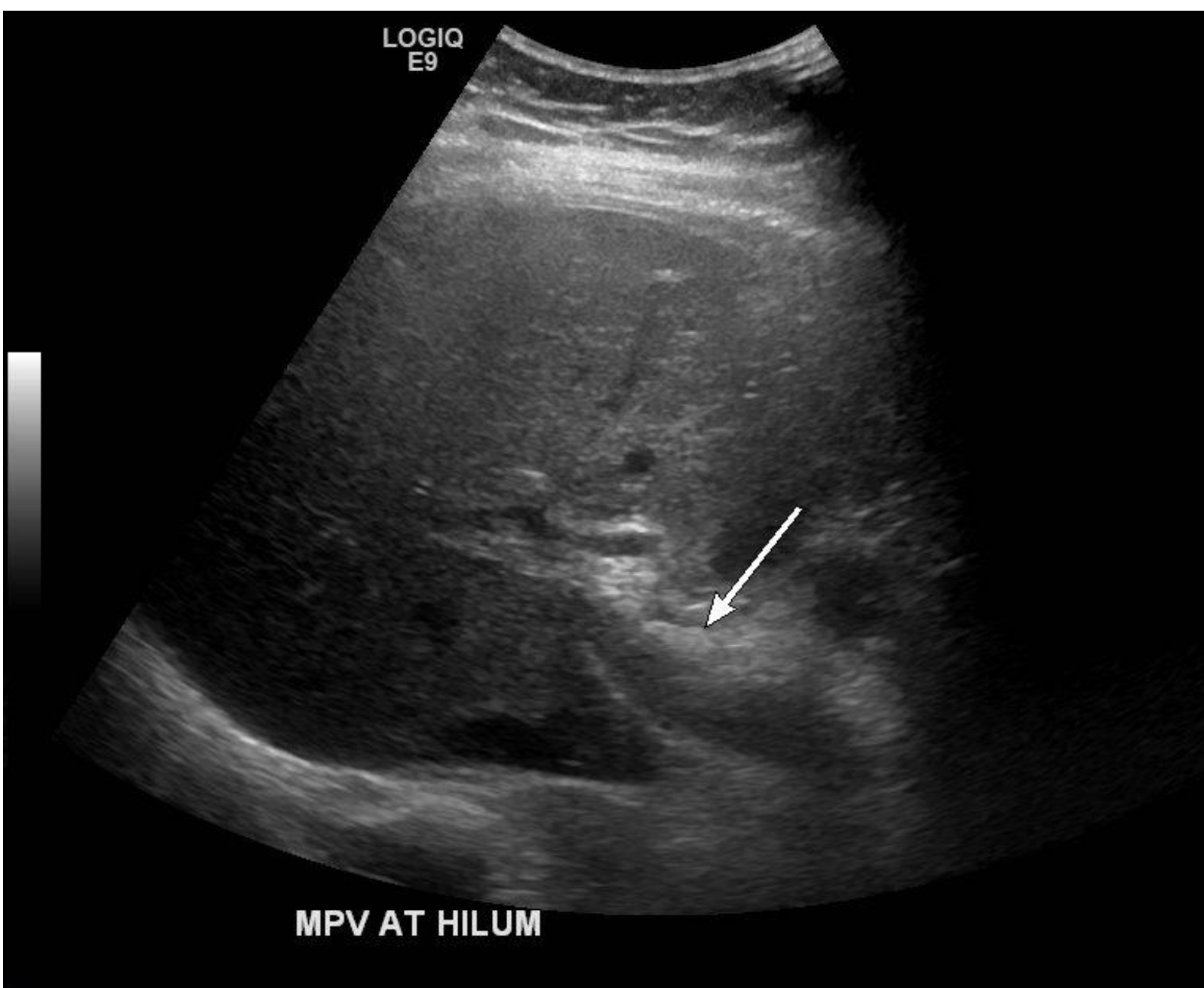


Fig 2. Ultrasound showing patent splenic vein in a morbidly obese patient prior to laparoscopic sleeve gastrectomy

Case 2

This is a 34-year-old woman with morbid obesity and history of gastric sleeve. She developed severe abdominal pain 2 weeks after surgery. Imaging studies documented the presence of portal vein thrombus.



US images show echogenic material in the main portal vein (arrow)consistent with acute thrombus(fig 3a). Duplex image (fig 3b) shows color in the hepatic artery and no flow in the portal vein (double arrow)confirming the presence of occlusive thrombus in the main portal vein



Fig 4a,4b Contrast enhanced CT scan . Images obtained at 65 seconds (venous phase), show thrombus within the portal vein (arrows).