The use of advanced endoscopic techniques in the field of hepatology has rapidly expanded over the last decade. Traditionally, endoscopy in patients with chronic liver disease was limited to screening/surveillance of gastroesophageal varices and colorectal polyps as well as endoscopic interventions for prophylaxis and treatment of acute variceal hemorrhage. Interventions such as endoscopic retrograde cholangiopancreatography (ERCP) have become standard of care for various hepatobiliary disorders and permit minimally invasive management, reducing the need for surgical and percutaneous interventions. ERCP evolved from a diagnostic to a therapeutic intervention, and ongoing improvements of accessories and novel devices continue to pave the road for increased therapeutic capabilities, even in highly complex cases. Biliary complications, once considered the Achilles heel of liver transplantation, can nowadays be treated successfully with ERCP in most patients. Balloon dilatation and incremental plastic stenting has been the treatment of choice for anastomotic biliary strictures in liver transplant recipients, obviating surgical reintervention. Novel therapeutic strategies, such as sequential plastic stent addition and using fully covered self-expandable metal stents, offer attractive alternatives to frequent plastic stent replacement with comparable outcomes. Single-operator cholangioscopy has dramatically improved over the past decade and now offers digital imaging on an extremely versatile platform, which has greatly increased the diagnostic yield of ERCP in the evaluation of biliary strictures by permitting accurate evaluation of vascular patterns in addition to providing image-guided sampling and therapeutic capabilities.
Endoscopic ultrasound (EUS) has also evolved from a purely image-based diagnostic procedure to an image-guided tissue sampling and therapeutic intervention. Although the endosonographic characteristics of certain lesions are important to differentiate benign versus malignant behavior, EUS-guided fine needle aspiration and fine needle biopsy permit histologic confirmation. EUS-guided liver biopsy is a clear example of refinement of an old technique and appropriate usage of technology to improve histologic samples and potentially decrease adverse events. The use of EUS guidance to obtain core liver biopsies has several theoretic advantages, at least compared with the percutaneous route. EUS provides real-time imaging with Doppler capability, and the needle travels only a very short distance to access both liver lobes, the latter being a significant advantage in obese patients. Improvements in core needles and suction/actuation techniques have dramatically improved the quality of tissue samples and the histologic yield. Furthermore, EUS-guided liver biopsy can be performed during the same session as esophagogastroduodenoscopy (EGD) for screening for gastroesophageal varices, and recovery time is significantly shorter than percutaneous techniques.

The applications of therapeutic EUS in patients with liver diseases continue to evolve. EUS-guided biliary drainage and endovascular access are some of the most exciting areas. Up until recently, percutaneous cholecystostomy drains were the main alternative for gallbladder drainage in patients with acute cholecystitis at high risk for surgery. Traditionally, most patients with decompensated liver disease and acute cholecystitis have been treated with percutaneous cholecystostomy drains, which are associated with significant adverse events and markedly reduced quality of life. Furthermore, there is usually no clear endpoint for these drains in this population. EUS-guided gallbladder drainage offers a safe, effective, and minimally invasive alternative to percutaneous cholecystostomy with improved quality of life. Although endoscopic therapy for esophageal varices is highly effective for prophylaxis and treatment of active hemorrhage, gastric varices have been difficult to treat endoscopically. Some centers offer endoscopic therapy for gastric varices with cyanoacrylate “glue” injection; however, there are important limitations to this therapy. EUS-guided endovascular coiling is an emerging technique associated with excellent technical and clinical success as well as a reassuring safety profile. Furthermore, a combination of EUS-guided coiling and glue injection appears to be an excellent therapeutic option for actively bleeding gastric varices in patients with severely decompensated chronic liver disease deemed to be at high risk for transjugular intrahepatic portosystemic shunt placement. Although not a therapeutic intervention but rather having important diagnostic and prognostic implications, EUS-guided portal pressure measurement presents an exciting opportunity to directly measure portal pressures in clinical practice. Selected centers, particularly in Europe, have used monitoring of portal pressures and hepatic venous pressure gradient through transjugular catheterization in clinical practice; however, the invasive nature of this technique has limited its application in most centers around the world. If further studies corroborate the safety and reliability of EUS-guided portal pressure measurement, this technique could also be part of the evaluation during EUS-guided liver biopsy and EGD for variceal screening/surveillance.

Advanced endoscopic interventions have also extended into bariatric procedures, offering truly minimally invasive options, such as endoscopic sleeve gastropasty and endoscopic duodenal mucosal resurfacing, for the management of obesity and related comorbid conditions. The obesity epidemic has propelled metabolic-associated fatty liver disease to be one of the leading causes of chronic liver disease in Western countries. Although traditional bariatric surgical interventions have proven
to improve hepatic steatosis, steatohepatitis, metabolic parameters and to diminish fibrosis, patients with chronic liver disease are frequently considered at high risk for surgical complications, thus the need for less invasive alternatives. However, what is most intriguing about endoscopic bariatric interventions is not only their minimally invasive nature and proven efficacy in achieving weight loss but also their positive impact on metabolic derangements, such as insulin resistance and improvements in hepatic fibrosis.

On behalf of all the contributors, I sincerely hope that this special issue of the Clìnics in Liver Disease stimulates further discussion, collaboration, and research between hepatologists and advanced endoscopists to continue improving the care of patients with chronic liver diseases.

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