

Interventionalists continue to expand use of percutaneous biliary endoscopy

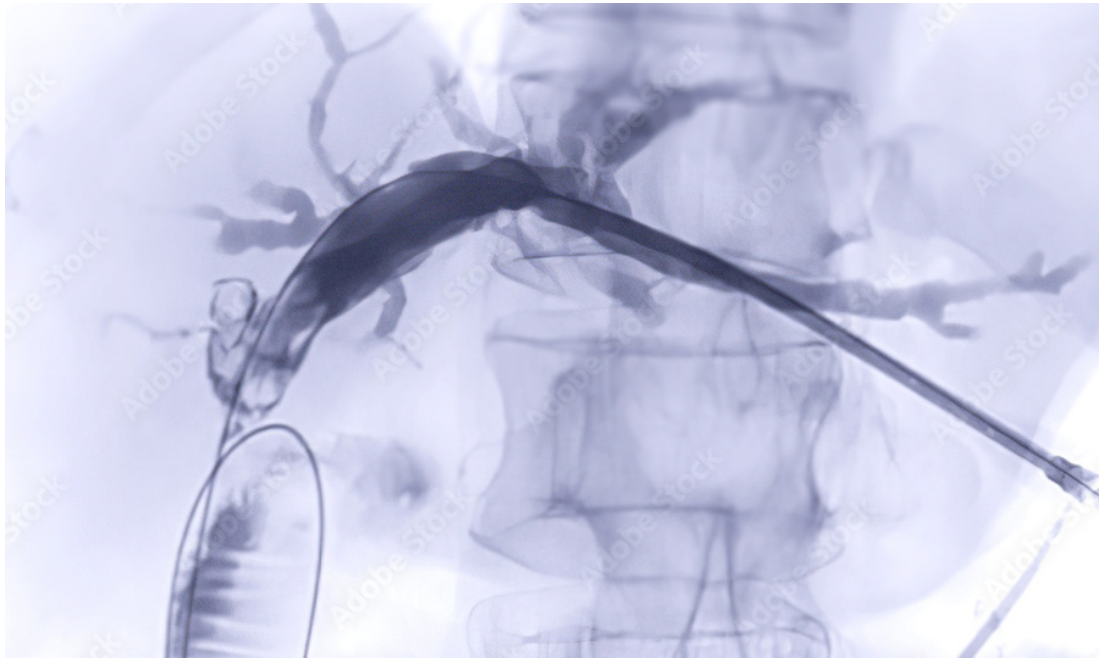


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Use of percutaneous biliary endoscopy has continued to expand as it proves to be an increasingly important tool for interventional radiologists. Recent advances at UCLA include the completion of a prospective study using percutaneous biliary endoscopy to treat benign biliary strictures, as well as extending the technique and gaining experience in using it in cases that would be extremely challenging or impossible to treat using other available modalities.



The Percutaneous Endoluminal Benign Biliary Laser (PEBBL) study enrolled six patients between late 2022 and late 2023 to study the long-term safety and efficacy of using percutaneous biliary endoscopy to treat benign biliary strictures utilizing a laser to cut scar tissue at the anastomotic location under direct visualization. Patients who have undergone liver transplantation, had a Whipple procedure to treat pancreatic cancer, or had any other surgery during which a new connection was made between the bile duct and the bowel are prone to developing scar tissue at the anastomosis that can interfere with bile drainage. Many of these patients have had to live with long-term biliary drains.

“The PEBBL study results were positive, with significant improvement in luminal gain,” says Ravi N. Srinivasa, MD, professor of clinical radiology, Division of Vascular and Interventional Radiology. “Another very positive outcome was that these patients no longer needed to have recurrent biliary drains put in. Some patients came into the study with long-term, in-dwelling biliary drains for as long as five to 10 years.”

In the course of treating patients with benign biliary strictures with direct visualization through endoscopy, UCLA interventional radiologists noted some cases where the suture left at the hepaticojejunostomy anastomosis — the anastomosis that is typical with liver transplantation — was too tight or had scarred over in a way that strangulated the anastomotic site, preventing the bile ducts from draining. “In the past, we’ve always assumed that strictures seen on fluoroscopy were just scar tissue,” explains Zachary M. Haber, MD, assistant professor of radiology, Division of Vascular and Interventional Radiology. “Now that we have endoscopes that can fit in this space and we’re using them more often, we’re finding that it’s not always just scar tissue — sometimes it’s something else that’s mechanically blocking the anastomosis.” Gastroenterologists performing conventional endoscopy through the mouth are seldom able to reach strictures in hepaticojejunostomy anastomoses as the distance is too far. “Our procedure is a direct shot into the liver, and you don’t have far to traverse to get to these strictures,” Dr. Haber explains. Once at the level of the anastomosis, the interventional radiologist uses a laser to cut the suture and forceps to pull it out

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through the endoscope. “Just pulling the suture out cures them,” says Dr. Haber, “it’s pretty remarkable.”

Stent Removal

UCLA interventional radiologists are also using percutaneous biliary endoscopy to remove long-term, in-dwelling biliary stents. “We would typically never have dared to remove a stent percutaneously, especially an uncovered biliary stent, because of the risk of causing trauma to the duct,” says Dr. Srinivasa. “Doing this procedure with fluoroscopy alone, you could be damaging the duct, perforating the duct, causing significant bleeding, and you would have no way of knowing.”

Using a combination of fluoroscopy and endoscopy provides a way for interventionalists to treat these challenging cases, which is described in an article by Dr. Haber recently published in the *Journal of Vascular and Interventional Radiology (JVIR)*. The technique involves using direct endoscopic visualization to assess the stent and any associated stones and debris to determine how best to extract them. These stents often unravel and come out in pieces, so this is an iterative process. After removing a piece using fluoroscopic guidance, the endoscope is used again to plan the next extraction and monitor for signs of damage. “We take another look with the endoscope to make sure there’s no bleeding or complications — perforations and things like that. As long as we see that things are looking good, then we continue with the removal,” explains Dr. Srinivasa.

Combined Endoscopy

UCLA interventional radiologists are continuing to discover novel ways to help patients by expanding the use of percutaneous biliary endoscopy. One recent example is the case of a patient who had undergone partial liver resection to treat her liver cancer. A line of surgical staples placed at the time of the resective surgery was unintentionally blocking the drainage of bile from the liver to the bowel, making the patient dependent on a drain that diverted the bile externally. UCLA gastroenterologists and interventional radiologists collaborated to devise a unique, combined procedure using endoscopes to provide visualization and access from two directions to address the patient’s challenging and complex anatomy.

“This was a kind of Hail Mary attempt at a life-altering procedure using a combined endoscopic technique to meet the patient’s unique needs,” explains Dr. Haber. While gastroenterologists

approached the site of the staples via ERCP, interventional radiologists used percutaneous biliary endoscopy to access the site from the opposite side. The two teams then used endoscopy to pass thin wires through the staple line and create a new pathway to place a tube to re-establish drainage from the bile duct to the bowel. “The area has now re-grown, with the body healing around the new drain so it bypasses the staple line and drains to the bowel,” says Dr. Haber.

Future Investigation

The use of percutaneous biliary endoscopy is likely to continue to grow and diversify as physicians test new ideas for improving on current percutaneous biliary endoscopy techniques or treating other conditions that are not being optimally managed using other available treatments. The first category includes a refinement to percutaneous biliary endoscopy laser treatment of benign biliary strictures that Dr. Srinivasa recently explored for the first time during the PEBBL trial. “I had noticed that the literature for ureteroenteric anastomoses included discussion of the injection of an anti-inflammatory steroid after laser treatment of existing scar tissue to inhibit the formation of new scar tissue from the laser procedure,” explains Dr. Srinivasa. To explore the utility of injecting steroid — in this case triamcinolone — through the endoscope at the level of the anastomosis, Dr. Srinivasa was forced to improvise as no needles were available to reach the stricture through the biliary endoscope. “I kind of ‘MacGyvered’ an endobronchial ultrasound biopsy needle to create a way to inject at the anastomosis,” says Dr. Srinivasa. “It wasn’t straightforward.”

The patient did not develop a recurrent stricture, but Dr. Srinivasa’s inquiry was intended only to test the concept for benign biliary strictures. The technique would have to be studied with a far greater number of patients, and a more suitable needle would have to be developed before steroid injection could be considered part of any standard of care for benign biliary anastomoses. 