Learning in therapeutic EUS

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The development of linear sectorial array EUS scopes in the early 1990 brought a new approach to the diagnostic and therapeutic dimensions of EUS capabilities, opening the possibility to perform puncture over a direct ultrasonographic guidance. Therapeutic EUS (TEUS) encompasses different procedures such as EUS-guided biliary drainage,[1,2] drainage of pancreatic fluid collections,[3,4] pancreatic duct drainage,[5] gallbladder drainage,[6] EUS-guided gastroenterostomy,[7,8] EUS-guided pancreatic tumor ablation.[9]

As percutaneous transhepatic biliary drainage (PTBD) is mostly performed by well-trained interventional radiologists in most countries, it is still debatable if gastroenterologists should be allowed to perform PTBD after ERCP failed cannulation.[10]

This has implication in terms of the volume of cases and the learning curve to become skillful in TEUS. Training in interventional EUS procedures requires deep knowledge of the accessories used. For example, one needs to know the type of needle to be used and how to choose the correct guidewire. The trainee needs to learn manipulation of the guidewire and stents during the therapeutic procedures.

The basic technique of interventional EUS is quite similar to those of ERCP or PTBD procedures. Learning ERCP and TEUS in parallel is the key point. EUS biliary drainage is now the first choice after ERCP failure. However, if the first step of the procedure is purely "ultrasonic" (puncture of the dilated bile duct), the other steps are very closed to ERCP. Actually, biliary drainage using EUS- and EUS-guided puncture of the bile duct (common bile duct or left hepatic duct), and EUS-guided rendezvous techniques are available options in some references centers. We classified the different approaches such as (a) intrahepatic approach (hepaticogastrostomy, puncture for rendezvous technique, and placement of a transhepatic anterograde self-expandable metal stent and (b) extrahepatic approach (choledocoduodenostomy, puncture for rendezvous technique through main bile duct).

It is the same for pancreatic collection drainage, pancreatic duct stenting, cholecystoduodenostomy, and gastrojejunal anastomosis. However, before starting TEUS, the endosonographer should perform routinely EUS-FNA and FNB with a high success rate (around 90%) and to be able to put a needle in a 5-mm diameter lesion.

The first TEUS procedure to learn is the pancreatic collection drainage using cystostome and double pigtail

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stents to manipulate catheter, guidewire, and stents with EUS scope which is a little bit different than a duodenoscope. After 20–30 collections drainage, the next procedure should be the cholecystoduodenostomy, then the biliary drainage (choledocoduodenostomy and hepaticogastrostomy), then EUS-guided pancreaticogastrostomy, and the gastrojejunal anastomosis.

However, interventional EUS procedures carry additional complications such as bile leakage, stent migration, bleeding, and even perforation.[11,12] Because of these potential risks, hands-on training of interventional EUS in real-life patients has become a huge challenge. Some centers have tried to develop phantom models for the purpose of training intervention procedures.[13-15] The performance of interventional EUS procedures requires high skill and expertise. As they carry potential risks, nonhuman models might be the best training tool at this moment.

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