

Quality in endoscopy training – the endoscopic retrograde cholangiopancreatography case

Ivan Jovanovic^{1,2}, Klaus Mönkemüller³

¹Clinic for Gastroenterology and Hepatology, ²Clinical Center of Serbia, University of Belgrade Medical School, Belgrade, Serbia; ³Division of Gastroenterology, Department of Visceral Surgery, Helios Frankenklinik Kronach, Kronach, Germany

Contributions: (I) Conception and design: I Jovanovic; (II) Administrative support: None; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: None; (V) Data analysis and interpretation: None; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Ivan Jovanovic. Clinic for Gastroenterology and Hepatology, Clinical Center of Serbia, University of Belgrade Medical School, Koste Todorovica 6, 11 000 Belgrade, Serbia. Email: ivangastro@beotel.net.

Abstract: Endoscopic retrograde cholangiopancreatography (ERCP) is one of the most advanced therapeutic procedures in gastrointestinal endoscopy. It is highly operator-dependent procedure requiring specific, knowledge-based training in order to achieve competence. Strategies for assessing competency of trainees and those in practice include numbers of procedures performed, and subjective or objective assessment by a mentor or self-assessment by the trainee. However, it is still not clear how to measure the quality in (ERCP) training in an objective and reproducible way, so far. Thus, in this article, we will discuss issues related to training in ERCP and provide experience based discussion on how to best approach and master this complex and risky procedure.

Keywords: Endoscopy; training; quality; endoscopic retrograde cholangiopancreatography (ERCP)

Submitted Jan 24, 2018. Accepted for publication Feb 09, 2018.

doi: 10.21037/atm.2018.03.03

View this article at: <http://dx.doi.org/10.21037/atm.2018.03.03>

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is one of the most advanced therapeutic procedures in gastrointestinal endoscopy associated with morbidity and mortality of 5–10% and 0.1–1%, respectively (1,2). This is highly operator-dependent procedure requiring additional training for the development of technical, cognitive, and integrative skills to achieve competence.

In order to achieve competence in performing ERCP, extensive knowledge of the anatomy, pathophysiology and hand skills are necessary. Achievement of competence is reached after extensive and intensive basic training and experience. However, it is still not clear how to measure competence in ERCP in an objective and reproducible way.

Although competence [as defined by the American Society for Gastrointestinal Endoscopy (ASGE)] is the “Minimal level of skills, knowledge and/or expertise derived

through training and experience that is necessary to safely and proficiently perform a task or procedure” (3-5), nowadays, training and certification process for ERCP is unreliable based on minimum number of procedures during training. In addition, this number is highly variable in different training programs and ranges from 100 to 200 procedures depending on the program (3-5). However, threshold numbers may not be sufficient and objective method to adequately measure competence are needed. In addition, in endoscopy, like in other disciplines, learning curves among individual trainees could substantially be different (6).

Comprehensive training can be broadly divided into two components: the cognitive and technical aspects. Fellows should be exposed not only to technical aspects of ERCP but also to patient care in general and have profound knowledge and understanding of indications and probable outcomes of ERCP, pancreaticobiliary anatomy, pathophysiology of pancreatobiliary disorders, different

endoscopic pathologies, radiological interpretation of ERCP imaging, but also other diagnostic imaging tests like trans-abdominal ultrasound, computed tomography scans and magnetic resonance, oncology, surgery, complications of the procedure and its management.

The need for training: who should be trained: few or all?

The training program should be adopted according to the needs of certain endoscopy service at given time. Therefore, it is important to measure the number of specialists needed to be trained in ERCP based on forecasted number of ERCP to be performed in defined population. Approximately, 0.75–1:1,000 of the population would undergo an ERCP each year, of which at least 75% would be therapeutic (7).

Training in ERCP should only be pursued by individuals having the necessary endoscopic skills and interest in treatment of hepatopancreaticobiliary disease (8). But, the selection process of trainees to train in ERCP is not an easy task as those individuals have to be identified. Some endoscopists quickly “pick up” technical skills required to perform ERCP while others do not have such a “talent” and will have difficulties to master the technique and quite frequently will miss the opportunity to learn clinical application of the procedure while struggling with handling the scope and different accessories.

The time for training in advanced endoscopic procedures, namely ERCP and endoscopic ultrasound (EUS) may involve gastroenterology fellowship and surgical residency or specialized, advanced pancreaticobiliary fellowships. As important as who should perform ERCP is the quality of their training. For example, if a highly skilled individual acquires suboptimal instructions and skills during training, her/his competence will be substandard. In most countries, gastroenterology fellowship programs require fellows to be exposed to endoscopic procedures including ERCP to have an understanding of the procedure, its indications, contraindications and possible adverse events. In most instances it occurs during the third year of the gastroenterology fellowship but should not be considered as procedural competence (6,8,9). During this period, trainees should undergo general program of endoscopic training that includes theoretical, knowledge based and hands-on practical training in upper endoscopy and colonoscopy. During this period fellows should be able to acquire

minimal skills to perform safe and effective basic endoscopic procedures.

Once they are considered to be competent in these “basic” procedures, they may pursue training in ERCP. Whether they need to be competent in colonoscopy is not clear, but skills of handling the colonoscope are certainly welcomed, especially if the fellow is expected to work in a center where patients with altered upper GI tract anatomy are treated, as often colonoscopy or balloon-assisted ERCP are mandatory in these patients.

The format of training: training programs

Terms of reference (ToR)

Institutions offering ERCP training program need to be explicit about the content of the training, whether they offer fellows exposure to ERCP or training to the level that includes independent, competent practice. To master advanced ERCP skills may require additional, dedicated time for training, usually an additional year of program (10,11).

Duration

So far, there has been no consensus on how long training in ERCP should be considered as base line of competence measure (12).

Professional societies suggest that the minimum time required to acquire technical and cognitive skills to perform ERCP is 12 months, assuming that fellows had previously completed classic gastroenterology training program. In most cases, this represents additional year of dedicated advance endoscopic training (10,13-18).

Content (cognitive and technical aspects)

Well-designed training program should include both, theoretical and practical tuition on (I) indications, contraindications; (II) instruments and accessories; (III) ERCP technique; (IV) possible adverse events and its management; (V) outcomes of the procedure and (VI) alternative approach in cases of failed procedure. Besides the development of endoscopic skills program should also offer coaching of other cognitive and behavioral aspects relevant to the clinical practice and performance of the procedure (14,17-19).

Simulation based training in endoscopy

Simulation based training has been used to teach and practice gastrointestinal in controlled environment, free of hands-on encountered complications. There are several simulators that can be used to assist in teaching. Mechanical or computer-based simulators and animal models (either *in vivo* or *ex vivo*) allow trainees to reduce learning curve in specific ERCP techniques such as control knobs and elevator fine movements, handling the accessories, deep cannulation of the desired ductal system etc. Still, simulation-based training cannot be considered sufficient to grant one with privileges to perform ERCP and further research is needed how to best translate technical skills acquired on models to a better clinical practice. We strongly believe that for ethical reasons all endoscopy trainee should first obtain their experience during short courses on simulation models, presumably *ex vivo*, especially for procedures such as stent placement, stone removal and endoscopic sphincterotomy, including needle knife incisions (20-22). There are several ERCP simulators and models for hands-on training more widely available than ever (21-26), and some of them like *ex vivo* models are inexpensive, easy to construct and reproducible (21,22). However, although strongly recommended by both, experts and societies, very few training programs offer simulator-based training in their core curriculum (26-29). Therefore, and despite the fact that hands-on training in performing ERCP results in expertise, more effort is need to include simulators regularly into ERCP training (5,8,9,13).

The place (endoscopy units involved in training)

For the most trainees, at least in Europe and South America, training takes place at their local endoscopy unit/hospital. In most countries these endoscopic units have been suffering from increasing demand over time to deliver their service to the community (payers). Potentially, this kind of busy environment may hamper quality of endoscopic training in those units and training activity is unfortunately often seen as interference with delivering service activity. When choosing (by trainees) or granting privileges (by institutions or societies) training endoscopy unit/hospital, this needs to be weighed against number of procedures that trainees should be exposed to and/or perform (case volume).

Who should be trainer?

Good trainer is of utmost value for trainees in endoscopy.

There are certain prerequisites for a trainer, namely clinical and teaching experience. Still, trainers, like in sports, have different teaching style; not necessarily the right or wrong option.

The good trainer must be flexible and optimistic, with strong communication skills, engaged, supportive, results oriented and with ability to assess trainees' needs. While some individuals hold by nature teaching capabilities, in most instances lack of formal education for trainers can result unstructured approach to training, sometimes resulting in impaired skill acquisition by a trainee (29,30). Ideally, the good teacher should have an ability to recognize the errors made by the trainee and correct their mistakes giving them specific instructions to complete a procedure without taking away the endoscope. Therefore, ad hoc and variable training of unconscious but otherwise competent trainer should be avoided (29,30).

To overcome such obstacles the World Gastroenterology Organization (WGO) started in 2001 and followed by other professional societies, the initiative to transfer the knowledge and teaching techniques to gastroenterologists in charge with training programs in their own countries (30-32). This has resulted in numerous train-the-trainers courses that are available on regular bases during the calendar year throughout the world for endoscopy trainers. These courses aim to develop framework for uniform approach to training in endoscopy while maintain conscious competence of both, skills they are teaching and how to train.

Joint Advisory Group (JAG) also accredits ERCP courses at a number of sites in the UK (32). These courses run for 3-4 days with participation of novice ERCP trainees, but are also organized for experienced endoscopist or as a train-the-trainers ERCP courses.

Only well-educated and effective trainers will ensure to deliver a trained, competent and effective endoscopist in a near future. Patience in coaching and allowing a trainee to practice the procedure without taking the scope away is an important quality for the trainer (30-32).

Competence

There are two aspects to ensuring competence: training and the subsequent assessment of the endoscopist as being competent (33,34).

Mastery of ERCP includes the ability to (I) selectively cannulate desired duct; (II) be able to adequately performed controlled sphincterotomy; (III) drain an obstructed biliary or pancreatic duct by placing by stent placement; (IV) extract stones of different sizes; (V) recognize and

adequately manage procedure related complications and (VI) collect sufficient information to establish an accurate diagnosis and treat patient efficiently (3,6,19,33-35). Regardless the fact that performing an arbitrary number of procedures does not necessarily define proficiency, completion of a certain number of ERCP procedures under the supervision of a trainer is mandatory to achieve acceptable rates of completed procedure (35-39).

Advanced therapeutic skills such as stricture dilation, pre-cut sphincterotomy techniques, self-expandable metal stent (SEMS) placement and papillectomy usually require additional training based on previous individual experience (33,34,36,39-42).

Skills assessment in model of supervised learning requires fulfillments of number-based criteria as measured against reference criteria. One example of number-based criteria regarding procedural competence, is the ASGE recommendation for CBD cannulation success rate of 80–85% after completion of ERCP training (34,38). In expert opinion this number is not scientifically sound but seems intuitively correct (37). Historically, this accepted benchmark for competence in ERCP was based on the study of Jowell and colleagues (more than 20 years ago) who for the first time, looked at trainees' learning curve for ERCP cannulation, and provided evidence that some 180 to 200 cases are required to achieve it (36). Their results later were used as a benchmark for several practice guidelines (39-41). More strict criteria include 90% cannulation rate for those who push towards independent practice (42).

Infrequently, attaining competence and granting privileges was left at the discretion of trainer (mentor) and in the worst cases scenario through unsupervised experiential learning.

In the near future, number-based criteria will be probably replaced by competency-based criteria as learning curves seem to be more valuable and relevant as performance measure than just a simple threshold numbers (39). This was also confirmed in a prospective study conducted by the same, Rotterdam, group (43) and in a recent multicenter study in US involving 62 training programs (44).

In the United Kingdom another tool is used for assessment of attained endoscopic skills. Direct observation of procedure or skill (DOPS) is an assessment tool designed to evaluate the performance of a trainee undertaking a practical procedure, against a structured checklist (45). The trainee receives immediate feedback to identify strengths and areas for development.

Recently, individual DOPS have been modified to

adopt ERCP. They are designed to assess trainees ability to perform the procedure independently. Procedure skills are directly observed for each of the four arbitrary divided sections: pre-procedure, procedure itself, post-procedure and so called endoscopic non-technical skills. Each section is further divided into individual components that are being observed and measured against predefined specific descriptors. This approach has proved to be feasible in colonoscopy training and time will tell whether it could successfully extrapolated on ERCP. Ideally, the final result of the assessment should combine evaluation of each and clearly defined individual component.

Maintenance of skills

Maintenance of ERCP skills is the sole responsibility of each endoscopist. Departments and hospitals should develop their own assessment and quality assurance measures in endoscopy general and specific for the ERCP (e.g., rate of post-ERCP pancreatitis) to assess individual endoscopist proficiency. The maintenance of skills is mostly dependent on number of procedures performed during a year in combination with continuing medical education, adoption of new techniques, regular attendance of live endoscopy events, scientific and industry meetings, use of online resources, follow of professional society's guidelines (46-48) etc.

Basic checklist for competency assessment (4,6):

- ❖ Pre-procedure assessment:
 - ◆ Detailed understanding of the informed consent process and good communication skills;
 - ◆ Explanation of the procedure;
 - ◆ Knowledge of the indication and contraindication for the procedure;
 - ◆ Patient's history including with special emphasis on comorbidities, anticoagulation status and need for antibiotics;
 - ◆ Knowledge and understanding of previously performed radiological examinations (transabdominal ultrasound-US; magnetic resonance cholangiopancreatography-MRCP; computed tomography-CT and endoscopic ultrasound-EUS).
- ❖ Procedural considerations and techniques:
 - ◆ Maintenance of patient comfort, dignity, and safety during the procedure;
 - ◆ Clear communication between professionals

- involved during the procedure;
- ♦ Scope handling and safe and appropriate Passage of the duodenoscope through upper GI tract in different patient's positions;
- ♦ Inspection of the papilla;
- ♦ Selective cannulation;
- ♦ Cannulation in altered anatomy (e.g., the presence of a perampullary diverticulum);
- ♦ Understanding and interpretation of normal and pathological findings on real-time and captured radiograms;
- ♦ Standard papillotomy;
- ♦ Stone extraction both with balloon and basket;
- ♦ Stenting-plastic and metal;
- ♦ Stent measurement;
- ♦ Guide-wire negotiation of both hepatic ducts and bile duct strictures;
- ♦ Dilatation of strictures-balloon and catheter;
- ♦ Intra-ductal biopsy and brush cytology;
- ♦ Familiarity with both, short and long wire systems;
- ♦ Pancreatic stenting;
- ♦ Mechanical lithotripsy;
- ♦ Appropriate use of fluoroscopy;
- ♦ Recognition and management of adverse events.

Conclusions

ERCP is highly effective technique to treat pancreaticobiliary disorders. To perform ERCP, comprehensive training is required that needs to be structured to develop both cognitive and manual skills. Usually, training programs are giving the opportunity for trainees to become familiar with basics of ERCP but not necessarily aim for trainees to become competent in ERCP. Competency is a cluster of related abilities and knowledge that continuously evolve and enables physician to perform ERCP safely and it is likely that in a near future fewer traditional GI fellowships will offer advanced endoscopy training. Nowadays competency can be measured and hopefully this would prevent undertrained individuals from gaining privileges. Once privileges are attained, it is a sole responsibility of the practitioners to maintain competency, but hospitals, regulatory bodies and perhaps payers themselves ought to be involved in credentialing and quality assurance initiatives (49,50).

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Freeman ML, Nelson DB, Sherman S, et al. Complications of endoscopic biliary sphincterotomy. *N Engl J Med* 1996;335:909-18.
2. Kalaitzakis E. All-cause mortality after ERCP. *Endoscopy* 2016;48:987-94.
3. Johanson JF, Schmitt CM, Deas TM, et al. Quality and outcomes assessment in Gastrointestinal Endoscopy. *Gastrointest Endosc* 2000;52:827-30.
4. Baron TH, Petersen BT, Mergener K, et al. Quality indicators for endoscopic retrograde holangiopancreatography. *Am J Gastroenterol* 2006;101:892-97.
5. Adler DG, Lieb 2nd JG, Cohen J, et al. ASGE/ACG Task Force on Quality in Endoscopy. Quality indicators for ERCP. *Gastrointest Endosc* 2015;81:54-66.
6. Shahidi N, Ou G, Telford J, et al. When trainees reach competency in performing ERCP: a systematic review. *Gastrointest Endosc* 2015;81:1337-42.
7. Cotton PB. Are low-volume ERCPists a problem in the United States? A plea to examine and improve ERCP practice-NOW. *Gastrointest Endosc* 2011;74:161-6.
8. American Association for the Study of Liver Diseases. American College of Gastroenterology. American Gastroenterological Association American Society for Gastrointestinal Endoscopy. Training the gastroenterologist of the future: the gastroenterology core curriculum. *Gastroenterology* 2003;124:1055-104.
9. Kim J, Park ET, Son BK, et al. ERCP educational guidelines for fellows. *Korean J Pancreas Biliary Tract* 2017;22:1-13.
10. Available online: https://www.asge.org/docs/default-source/education/practice_guidelines/doc-competence.pdf?sfvrsn=6
11. Eisen GM, Dominitz JA, Faigel DO et al. Guidelines for advanced endoscopic training. *Gastrointest Endosc* 2001;53:846-8.
12. Cotton PB, Romagnuolo J, Faigel DO et al. The ERCP

- quality network: a pilot study of benchmarking practice and performance. *Am J Med Qual* 2013;28:256-60.
13. GIQuIC. Special Report – The GI Quality Improvement Consortium: Helping Practices Improve Quality and Outcomes in Endoscopy. *Gastroenterology & Endoscopy News*, March 2015, Available online: www.giquic.gi.org. Accessed December 23, 2017.
 14. The Conjoint Committee for the Recognition of Training in Gastrointestinal Endoscopy. Available online: www.conjoint.org.au. Accessed December 23, 2017.
 15. Cohen S, Bacon BR, Berlin JA et al. National Institutes of Health State-of-the-Science Conference Statement: ERCP for diagnosis and therapy, January 14-16, 2002. *Gastrointest Endosc* 2002;56:803-9.
 16. Available online: <https://www.asge.org/home/education-meetings/advanced-education-training>
 17. British Society of Gastroenterology. Available online: www.bsg.org.uk/clinical/news/ercp---the-way-forward-a-standards-framework.html. Accessed December 23, 2017.
 18. Adler DG, Baron TH, Davila RE, et al; Standards of Practice Committee of the American Society for Gastrointestinal Endoscopy. ASGE guideline: the role of ERCP in diseases of the biliary tract and the pancreas. *Gastrointest Endosc* 2005;62:1-8.
 19. Chutkan RK, Ahmad AS, Cohen J, et al; ERCP Core Curriculum prepared by the ASGE Training Committee. ERCP core curriculum. *Gastrointest Endosc* 2006;63:361-76.
 20. Parra-Blanco A, González N, González R et al. Animal models for endoscopic training: do we really need them?. *Endoscopy* 2013;45:478-84.
 21. Jovanovic I, Fry LC, Rustemovic N, et al. Initial validation of a simple, nonbiological, mechanical ERCP training model for cannulation and stent placement. *Endoscopy* 2015;47:E585-6.
 22. Rustemovic N, D'Assuncao M, Bilic B, et al. A simple ex vivo, biologic ERCP training model for sphincterotomy. *Endoscopy* 2015;47:E401-3.
 23. von Delius S, Thies P, Meining A, et al. Validation of the X-Vision ERCP Training System and technical challenges during early training of sphincterotomy. *Clin Gastroenterol Hepatol* 2009;7:389-96.
 24. Velázquez-Aviña J, Sobrino-Cossío S, Chávez-Vargas C, et al. Development of a novel and simple ex vivo biologic ERCP training model. *Gastrointest Endosc* 2014;80:1161-7.
 25. Boix J, Lorenzo-Zúñiga V, Moreno de Vega, et al. Identification of significant difficulty of selective deep cannulation by a simple predictive model: an endoscopic scale for teaching ERCP. *Surg Endosc* 2008;22:1678-85.
 26. Sedlack R, Petersen B, Binmoeller K, et al. A direct comparison of ERCP teaching models. *Gastrointest Endosc* 2003;57:886-90.
 27. Leung J, Lim B, Ngo C, et al. Head-to-head comparison of practice with endoscopic retrograde cholangiopancreatography computer and mechanical simulators by experienced endoscopists and trainees. *Dig Endosc* 2012;24:175-81.
 28. Lim BS, Leung JW, Lee J, et al. Effect of ERCP mechanical simulator (EMS) practice on trainees' ERCP performance in the early learning period: US multicenter randomized controlled trial. *Am J Gastroenterol* 2011;106:300-6.
 29. Williams EJ, Taylor S, Fairclough P, et al. BSG Audit of ERCP. Are we meeting the standards set for endoscopy? Results of a large-scale prospective survey of endoscopic retrograde cholangio-pancreatograph practice. *Gut* 2007;56:821-9.
 30. Available online: <http://www.worldgastroenterology.org/education-and-training/train-the-trainers>
 31. Waschke KA, Anderson J, Macintosh D, et al. Training the gastrointestinal endoscopy trainer. *Best Pract Res Clin Gastroenterol* 2016;30:409-19.
 32. Available online: <http://www.jets.nhs.uk>
 33. Watkins JL, Etzkorn KP, Wiley TE, et al. Assessment of technical competence during ERCP training. *Gastrointest Endosc* 1996;44:411-15.
 34. Faigel DO, Lewis B, Petersen BT, et al. Ensuring Competence in Endoscopy 2006. Available online: <http://s3.gi.org/physicians/EnsuringCompetence.pdf>
 35. Cotton PB, Eisen G, Romagnuolo J, et al. Grading the complexity of endoscopic procedures; results of an ASGE working party. *Gastrointest Endosc* 2011;73:868-74.
 36. Jowell PS, Baillie J, Branch MS, et al. Quantitative assessment of procedural competence. A prospective study of training in endoscopic retrograde cholangiopancreatography. *Ann Intern Med* 1996;125:983-9.
 37. Cotton PB. How many times have you done this procedure, doctor? *Am J Gastroenterol* 2002;97:522-3.
 38. Jorgensen J, Kubiliun N, Law JK, et al. on behalf of ASGE Training Committee. Endoscopic retrograde cholangiopancreatography (ERCP): core curriculum. *Gastrointest Endosc* 2016;83:279-89.
 39. Ekkelenkamp VE, Koch AD, de Man RA, et al. Training and competence assessment in GI endoscopy: a systematic

- review. *Gut* 2016;65:607-15.
40. Ang TL, Cheng J, Khor JL, et al. Endoscopic Retrograde Cholangiopancreatography (ERCP). Guideline on training and credentialing in endoscopic retrograde cholangiopancreatography. *Singapore Med J* 2011;52:654-7.
 41. Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Guidelines Committee. Guidelines for training in diagnostic and therapeutic endoscopic retrograde cholangiopancreatography (ERCP). *Surg Endosc* 2007;21:1010-1.
 42. Isaacs P. Endoscopic retrograde cholangiopancreatography training in the United Kingdom: A critical review. *World J Gastrointest Endosc* 2011;3:30-3.
 43. Ekkelenkamp VE, Koch AD, Rauws EA, et al. Competence development in ERCP: the learning curve of novice trainees. *Endoscopy* 2014;46:949-55.
 44. Wani S, Keswani R, Hall M, et al. A Prospective Multicenter Study Evaluating Learning Curves and Competence in Endoscopic Ultrasound and Endoscopic Retrograde Cholangiopancreatography Among Advanced Endoscopy Trainees: The Rapid Assessment of Trainee Endoscopy Skills Study. *Clin Gastroenterol Hepatol* 2017;15:1758-67.
 45. Bekkali NL, Johnson GJ. Training in ERCP and EUS in the UK anno 2017. *Frontline Gastroenterology* 2017;8:124-8.
 46. Testoni PA, Mariani A, Aabakken L, et al. Papillary cannulation and sphincterotomy techniques at ERCP: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2016;48:657-83.
 47. Dumonceau JM, Andriulli A, Elmunzer BJ, et al. European Society of Gastrointestinal Endoscopy. Prophylaxis of post-ERCP pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - updated June 2014. *Endoscopy* 2014;46:799-815.
 48. Dumonceau JM, Delhaye M, Tringali A, et al. Endoscopic treatment of chronic pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2012;44:784-800.
 49. Cotton PB. ERCP is most dangerous for people who need it least. *Gastrointest Endosc* 2001;54:535-6.
 50. Cotton PB, Shahidi N, Ou G, et al. ERCP (Ensuring Really Competent Practice): enough words-action please! *Gastrointest Endosc* 2015;81:1343-5.

Cite this article as: Jovanovic I, Mönkemüller K. Quality in endoscopy training—the endoscopic retrograde cholangiopancreatography case. *Ann Transl Med* 2018;6(13):264. doi: 10.21037/atm.2018.03.03