ADVANCES IN ENDOSCOPY

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Grading the Degree of Difficulty of ERCP Procedures

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G&H Approximately 10 years ago, you developed a scale to grade the complexity of endoscopic retrograde cholangiopancreatography procedures. Why was there a need for this scale?

SMS My mentors at Duke University Medical Center, Drs. Joseph Leung, John Baillie, and Peter Cotton, trained me to perform all types of endoscopic retrograde cholangiopancreatography (ERCP) procedures, not just the basic ones. When I began working on my own (and training my own fellows), the most advanced cases were frequently given to me. This arrangement had both advantages and disadvantages: Taking on challenging cases and succeeding was satisfying, but failing—which happened more frequently because these were difficult ERCP procedures—was not. I knew that gastroenterologists could review a list of my failed cases and immediately know that they were technically difficult, but other individuals would not be able to do so; for example, a gastroenterologist would understand that a pancreatic stone is much more difficult to remove than a bile duct stone, but an insurance auditor or government official probably would not. With increased medical oversight becoming likely in the future, more and more people will have access to procedural outcome data. My goal in creating the Schutz scale was to place ERCP outcomes, particularly technical failures, into proper context. At the time, there was no degree-of-difficulty scale.

G&H How does this scale work?

SMS The scale was designed to enable any individual to understand the difference between easy and difficult ERCP procedures. It was modeled after rock climbing cliffs, in which climbs are rated on a numerical degree-of-difficulty scale, and the number does not depend on the climber. Originally, the ERCP difficulty grading scale ranged from 1 to 5, with 1 being a relatively easy ERCP procedure and 5 being a difficult ERCP procedure. A few years later, a committee from the American Society for Gastrointestinal Endoscopy (ASGE), of which I was a part, eliminated 2 of the grades, making the scale range from grade 1 to grade 3.

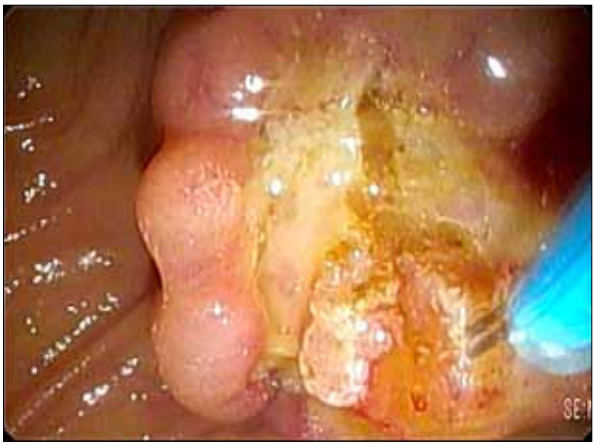

Figure 1. Needle-knife papillotomy for treatment of ampullary cancer; this is an example of an endoscopic retrograde cholangiopancreatography procedure with a high degree of difficulty.

Image courtesy of Dr. John Baillie, Cartaret Medical Group, Morehead City, North Carolina.

Table 1. Grades of Difficulty of Endoscopic Retrograde Cholangiopancreatography (ERCP) Procedures*

Grade	Procedure
1	Deep cannulation of duct of interest, main papilla, or sampling
	Biliary stent removal or exchange
2	Biliary stone extraction <10 mm
	Treatment of biliary leaks
	Treatment of extrahepatic strictures (benign or malignant)
	Placement of prophylactic pancreatic stents
3	Biliary stone extraction >10 mm
	Minor papilla cannulation in divisum and therapy
	Removal of internally migrated biliary stents
	Intraductal imaging, biopsy, or fine-needle aspiration
	Management of acute or recurrent pancreatitis
	Treatment of pancreatic strictures
	Removal of pancreatic stones that are mobile and <5 mm
	Treatment of hilar tumors
	Treatment of benign biliary strictures, hilum, and above
	Management of suspected sphincter of Oddi dysfunction (with or without manometry)
4	Removal of internally migrated pancreatic stents
	Intraductal image–guided therapy (eg, photodynamic therapy)
	Removal of pancreatic stones that are impacted and/or >5 mm
	Removal of intrahepatic stones
	Pseudocyst drainage or necrosectomy
	Ampullectomy
	ERCP after a Whipple procedure or Roux-en-Y bariatric surgery

*One grade should be added (for a maximum grade of 4) for procedures performed after normal working hours, in children under 3 years of age, in post–Billroth II gastrectomy patients, or for procedures that have previously failed.

Adapted from Cotton PB, et al. *Gastrointest Endosc.* 2011;73:868-874.

G&H According to that scale, what are examples of grades 1, 2, and 3 procedures?

SMS Removal of a bile duct stone measuring less than 10 mm in diameter is a grade 1 procedure. If the bile duct stone is equal to or greater than 10 mm in diameter, the procedure is considered to be grade 2. Removal of a pancreatic duct stone of any size is a grade 3 procedure. Figure 1 illustrates a procedure with a high degree of difficulty.

G&H How have the suggested ERCP complexity grades held up over time?

SMS The concept of a difficulty scale has held up very well. Since my paper was published in 2000, some endoscopists have voiced concerns that grade 1 ERCP procedures can end up being very challenging while some grade 3 ERCP procedures turn out to be easy. My response has been that the grade is an indicator of difficulty over the course of many ERCP procedures, and most grade 1 ERCP procedures are relatively easy while most grade 3 ERCP procedures are harder to complete successfully. This has turned out to be true.

G&H Who is currently using the Schutz scale?

SMS The scale is widely used, primarily in outcomes studies. However, the scale also has applications in the clinical setting. I am involved with a national database program, in which I enter clinical details on all my ERCP procedures, as do many other endoscopists, in order to track our complication and technical success rates. We use the degree-of-difficulty scale to place these outcomes data into perspective.

The scale is also being used in other countries. Last year, a friend sent me a picture of the scale taped to a wall of an endoscopy laboratory in the Netherlands.

In the future, insurance companies and/or the government will be able to access more of our outcomes information. I hope that by getting ahead of that reality, the gastroenterology community will be able to manage how our own data are used.

G&H Has the scale spread to other areas in gastroenterology?

SMS Yes. In part, I think that the best indicator that the concept of procedural degree-of-difficulty grading has been accepted is its utilization for other procedures. I was part of an ASGE working group that developed individual grading scales for upper endoscopy, colonoscopy, and endoscopic ultrasound (as well as updated

my scale for ERCP), and the results of our efforts were published in *Gastrointestinal Endoscopy* several months ago. Interestingly, the group decided to use a 4-point scale for each type of endoscopic procedure instead of the previous 3-point scale (Table 1).

G&H Why was the scale expanded to 4 points?

SMS We thought that including another point made sense. One point is now automatically added to the degree of difficulty for procedures performed after normal working hours, in children under 3 years of age, in post–Billroth II gastrectomy patients, or in procedures that have previously failed.

When I first came up with the idea of developing a degree-of-difficulty scale, I worked alone, but now the scale belongs to the endoscopy community and is part of the ASGE. Thanks to input from many expert collaborators, my original idea has been improved tremendously.

G&H Over the past decade, what have been the main changes in ERCP practice that might require modification of the scale in the future?

SMS Baby scopes are being used more frequently to examine the bile duct or pancreas; otherwise, ERCP practice has not changed markedly over the past 10 years. Nevertheless, I am curious to see how ERCP evolves over the next 10 years. New technologies will inevitably develop in the future, and it will be our challenge to look at them carefully and decide where they fit into our existing framework. We now have a good system in place to help us frame our outcomes for procedures presently being performed, and I think that system will allow for the addition of new technologies as they become available.

G&H Since ERCP procedures vary in difficulty, as shown by the scale, should specialist centers offer 2 levels of ERCP training (ie, basic vs advanced)?

SMS Offering 2 levels of training makes sense. Typical community ERCP procedures with low difficulty grades—such as removing bile duct stones or stenting the bile duct when postcholecystectomy leaks or obstructive jaundice are present—can typically be performed by most gastroenterologists. In these cases, there is no need for patients to travel to an expert center; they can stay in the comfort of their local surroundings. On the other hand, cases with higher-difficulty grades (such as pancreatic pseudocysts) are probably best left to advanced endoscopists and specialized centers.

Suggested Reading

Schutz SM, Abbott RM. Grading ERCPs by degree of difficulty: a new concept to produce more meaningful outcome data. *Gastrointest Endosc*. 2000;51:535-539.

Cotton PB, Eisen G, Romagnuolo J, et al. Grading the complexity of endoscopic procedures: results of an ASGE working party. *Gastrointest Endosc*. 2011;73:868-874.

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Cotton PB. Quality endoscopists and quality endoscopy units. *J Interv Gastroenterol*. 2011;1:83-87.