

Accreditation System for Laparoscopic Gastroenterologic Surgeons in Japan

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It is obvious that the outcome of surgery is not only influenced by the surgeon's knowledge, but also by his or her technique. This is prominently seen in endoscopic surgery because it requires very specific techniques. The incidence of complications associated with surgery has increased since the introduction of endoscopic surgery in Japan, and this is mainly related to poor technique. Education about endoscopic surgery based on a specific program and technical accreditation are both necessary in order to reduce complications. The Japan Society for Endoscopic Surgery (JSES) has organized educational seminars, workshops using animals, and lectures about suturing. In 2001, the JSES also established the Committee of the Endoscopic Surgical Skill Qualification System, consisting of members selected from the fields of gastroenterologic surgery, obstetric/gynecologic surgery, urologic surgery, respiratory surgery, orthopedic surgery, and pediatric surgery. The committee discussed the basic concepts of an accreditation system and decided on the following four points: 1) an applicant must be a specialist in a certain field and have sufficient experience in endoscopic surgery; 2) technical assessment is performed by viewing an unedited video of surgery performed by the applicant; 3) surgeons whose technique is sufficiently good for them to act as instructors should be accredited; and 4) a judging committee should be established in each field. The first accreditation examination for endoscopic surgeons was held for obstetric/gynecologic surgeons in 2003, while surgeons from the fields of gastroenterology, urology,(1) and orthopedics were assessed in

2004. Since then, examinations have been conducted once a year.

A third-party accreditation system like this has not been established in any other country. Here, we report on the methods and results of performing endoscopic surgery accreditation examinations in the field of digestive surgery.

Methods

Selection of Judges

The committee consisting of eight JSES directors specializing in digestive surgery, and three accreditation system committee members in the field of digestive surgery selected members of the judging committee. The list of candidate judges consisted of 25 Japanese endoscopic surgeons. They submitted unedited videos of themselves performing endoscopic surgery, and they mutually assessed their surgical techniques. As a result, all of the surgeons possessed a level of technique required to become judges. Judges (a total of 49) were replaced or added by selection from among surgeons who had passed the accreditation examination with a high score. The names of the judges were kept confidential.

Requirements and Specifications

The following five requirements must be fulfilled by applicants: 1) they must be specialist surgeons; 2) they must have attended the JSES scientific meeting (3 points), educational seminars (4 points), or workshops using animals (3 points), with a total of 12 points necessary; 3) they must have conducted simple surgical procedures (including cholecystectomy)

on at least 50 patients, or complex procedures (including colectomy) on 20 patients; 4) they must be recommended by two instructors; and 5) they must have published at least three reports on endoscopic surgery at scientific meetings and two theses.

Surgeons who claim to meet these requirements must submit documents that prove their claims, a list of patients on whom they have performed surgery (including complications), an unedited video that shows one of the surgical procedures in Table 1 (if the submitted video does not include suturing and knot-tying, another video that includes these procedures also needs to be submitted), and an examination fee of 30,000 yen (\$250) to the Judging Committee for

Endoscopic Gastroenterologic Surgery.

Method of Assessment

The judges are divided into the following six groups according to their specialties: esophagus, stomach, colon, biliary tract, spleen, and endocrine/breast.

For overall judgment of the techniques required for endoscopic surgery, common criteria (Table 2) and procedure-specific criteria (Table 3 shows those for distal gastrectomy) are used. A maximum of 60 points can be given to applicants for the former criteria, and 40 points for the latter. Applicants who score a minimum of 70 points achieve accreditation.

TABLE 1. PROCEDURES THAT CAN BE SUBMITTED AND ACCREDITED

- | | |
|------------------------------|-------------------------|
| • Distal gastrectomy | • Splenectomy |
| • Sigmoidectomy | • Adrenalectomy |
| • Esophagectomy | • Nephrectomy |
| • Nissen's operation | • Mastectomy |
| • Heller's operation | • Thyroidectomy |
| • Cholecystectomy | • Inguinal hernioplasty |
| • Common bile duct clearance | |

TABLE 2. COMMON CRITERIA (POINTS ALLOTTED)

Category 1: Progress of the operation

Smooth conduct of the operation (6 points)

Level of cooperation with assistants (6 points)

Category 2: Development of the operating field

Proper positioning of the access ports (3 points)

Clear display of the operating field (target organ) (6 points)

Proper use of the retractor and grasping forceps (6 points)

Category 3: Operative techniques

Proper selection and appropriate use of forceps (3 points)

Proper methods of traction and tissue grasping (3 points)

Appropriate and smooth use of the correct type of energy (3 points)

Correct layer of tissue dissection (6 points)

Correct identification and proper coagulation or clipping of blood vessels (6 points)

Category 4: Suturing and knot-tying

Suturing (6 points)

Knot-tying (6 points)

TABLE 3. PROCEDURE-SPECIFIC
CRITERIA FOR DISTAL GASTRECTOMY

Two points are allotted for each item.

1. Is the port located at an appropriate position?
2. Is the operating field secured by appropriate exclusion of the liver, etc.?
3. Are appropriate grasping forceps used that can prevent injury to the stomach, duodenum, and small and large intestines?
4. Are the tissues grasped with appropriate force?
5. Is the gastric wall or intestinal wall grasped at full thickness (all layers)?
6. Is the correct site pulled in the proper direction?
7. Is there any serosal damage?
8. Is there any bleeding caused by rough use of grasping forceps?
9. Is the gastrocolic ligament divided appropriately?
10. Are any measures taken to prevent injury to the large intestine?
11. Is the left gastric vein removed appropriately?
12. Is the left gastric artery removed appropriately?
13. Are any measures taken to prevent injury to the pancreas?
14. Is the No. 1 lymph node dissected appropriately?
15. Is the No. 3 lymph node dissected appropriately?
16. Is the extent of lymph node dissection sufficient?
17. Is gastroduodenal anastomosis completed without error?
18. Is blood flow adequate at the anastomotic site?
19. Is there excessive tension at the anastomosis?
20. Is the anastomosis constructed with a good shape?

Unedited videos are assessed by two judges. Applicant names are not disclosed to the judges, and vice versa. If both judges give a score of 70 points or more, the applicant achieves accreditation. If the two judges disagree, final judgment is made by either a third judge or by a group assessment.

Statistical Analysis

As a test for the significance of differences, the unpaired t-test or Mann-Whitney U test was used.

Results

Success Rate

Examinations were completed in 2004 and 2005, and there were 217 applicants for the 2006 examinations.

In 2004, there were 422 applicants, of whom 32 were rejected after examination of their documents and 177 were rejected by assessment of their videos. The other 212 (50.2%) passed the test (Table 4). The success rate was highest for the biliary tract (64.7%) and lowest for the esophagus (28%). In 2005, six applicants were found to have documents that did not fulfill the requirements and were rejected, leaving 269 applicants. Among those, 141 failed the video examination and 128 (48%) were accredited (Table 4). The success rate was a remarkable 75% for endocrine/breast, but was only 39% for the colon and 40% for the spleen.

Inter-rater Agreement

Inter-rater agreement between the two judges was investigated by using Cohen's weighted kappa values (Table 5). The overall kappa value was low (0.31) in 2004, which suggested that inter-rater agreement was poor. The level of inter-rater agreement was

higher (0.40) for the colon, but lower (0.18) for the biliary tract. The overall kappa value increased to 0.40 in 2005, which suggested better inter-rater agreement. Kappa values for the biliary tract and stomach increased markedly compared with those for 2004, reaching 0.35 and 0.59, respectively.

TABLE 4. SUCCESS RATE FOR EACH SURGICAL CATEGORY

	2004			2005		
	No. of Applicants	Successful	Success Rate	No. of Applicants	Successful	Success Rate
Biliary tract	170	110	64.7%	137	62	45.3%
Esophagus	32	9	28%	17	10	58.8%
Stomach	81	37	45.7%	37	21	56.7%
Colon	103	38	36.9%	61	24	39.3%
Spleen	18	9	50%	5	2	40%
Endocrine, etc	18	9	50%	12	9	75%
Total	422	212	50.2%	269	128	47.6%

TABLE 5. COHEN'S WEIGHTED KAPPA VALUES FOR THE TWO INITIAL JUDGES

	2004	2005
Biliary tract	0.18	0.35
Esophagus	0.36	0.28
Stomach	0.37	0.59
Colon	0.40	0.37
Total	0.31	0.40

TABLE 6. RELATIONSHIP BETWEEN SUCCESS AND THE COMPLICATION RATE

Complication rate (%) (mean \pm standard error)

	2004			2005		
	Successful	Failed	P Value	Successful	Failed	P Value
Biliary tract	4.2 \pm 0.6	4.3 \pm 0.9	0.87	2.9 \pm 0.6	3.0 \pm 0.7	0.64
Esophagus	3.3 \pm 1.7	6.4 \pm 1.7	0.27	12.4 \pm 4.9	5.5 \pm 1.3	0.52
Stomach	6.7 \pm 1.1	7.1 \pm 1.5	0.85	3.0 \pm 0.8	8.4 \pm 1.9	0.019
Colon	6.0 \pm 1.3	8.4 \pm 1.2	0.18	3.3 \pm 1.3	7.4 \pm 1.4	0.047
Total	4.8\pm0.5	6.5\pm0.6	0.048	3.7\pm0.6	4.8\pm0.5	0.19

Video Examination and Incidence of Complications

The relationship between the outcome of the video examination and the incidence of complications was investigated using the lists of patients supplied by applicants, which included information about complications (Table 6).

In 2004, the overall incidence of complications was significantly lower in patients treated by applicants who passed the examination (4.8%) than in patients treated by applicants who failed (6.5%). However, there were no significant differences in relation to surgery or specific organs. In 2005, the incidence of complications after gastric or colonic surgery was significantly lower in patients treated by applicants who passed the examination (3.9% and 6.4%, respectively) than in those treated by applicants who failed the examination (7.7% and 8.5%). However, there was no significant difference in the overall incidence of complications.

Discussion

The entire endoscopic surgery procedure can be recorded by video, which makes it possible for surgeons and judges to watch the same operating field and maintain anonymity. As mentioned above, use of videos appears to make the examination easier. However, reliable and fair assessment of surgical techniques, which have been described as an art, is a very difficult issue.

There have been a number of reports about technical assessment methods, including the use of videos or watching live surgery. Winckel et al.(2) introduced a structured technical skills assessment form (STSAF), which employed both procedure-specific checklists and a global rating (global assessment). Martin et al.(3) also introduced an objective structured assessment of technical skill (OSATS), which included specific checklists and a global rating, as well as a pass/fail judgment. For assessment of laparoscopic cholecystectomy technique, Eubanks et al.(4) introduced an objective scoring system, that rates surgical techniques by adding points for a *pass* and

subtracting points for a *fail* in each procedure. In 2005, Vassiliou et al.(5) introduced the Global Operative Assessment of Laparoscopic Skills (GOALS), which includes both a global assessment and a 10-item checklist, taking into account a visual analogue scale for surgical difficulty. These assessment methods have been used by surgical trainers when assessing residents and young surgeons. Reports indicate very high inter-rater agreement between the trainers and repeatability of their assessments.

The JSES Judging Committee for Endoscopic Gastroenterologic Surgery established both common criteria and procedure-specific criteria to assess endoscopic surgical techniques. However, inter-rater agreement between the two judges was not very high. As mentioned, the overall kappa value for the 2004 ratings was low at 0.31, so the reliability of the judgments was questionable. Fairness was ensured to some extent by either a third judge or a group decision when the two raters could not agree. However, an increase in inter-rater agreements appears to be essential for this system to continue. After the completion of examinations for 2004, the reasons for the low inter-rater agreement were discussed by the Judging Committee. Possible reasons included: 1) surgical procedures differed between institutions (especially cholecystectomy); 2) specifications for surgical techniques were vague; and 3) procedure-specific criteria were imprecise. As countermeasures for reason 1, consensus meetings were held for judges to discuss differences in surgical procedures and the permissible range, especially for cholecystectomy. As countermeasures for reason 2, the following specifications were added to reduce differences in the difficulty of surgery: "A video of hand-assisted laparoscopic surgery is not acceptable;" "Distal gastrectomy is only acceptable with lymph node dissection for stomach cancer;" and "Sigmoidectomy is only acceptable with lymph node dissection for colon cancer and intraperitoneal anastomosis." As countermeasures for reason 3, the procedure-specific criteria were modified to more detailed criteria for