

# Endoscopic Surgery: Current status in Japan

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## Abstract

The first laparoscopic cholecystectomy in Japan was performed in 1990. During the same year, the Endoscopic Surgery Study Group (later, the Japan Society for Endoscopic Surgery [JSES]) was established, and subsequently marked development in the field of endoscopic surgery was achieved in Japan. According to a questionnaire survey carried out by JSES in 2006, a total of 620,896 endoscopic surgeries had been performed by the end of 2005 (abdominal, 357,823 cases; obstetric & gynecology, 130,264 cases; respiratory, 94,316 cases; urology, 18,135 cases). The JSES Education Committee contributed to the steady spread of endoscopic surgery through the following activities: developing guidelines, supporting training sessions and workshops, hosting educational seminars, publishing glossaries, holding training sessions for ligature-suture techniques, and so on. The Endoscopic Surgical Skill Qualification System Committee of JSES began accreditation reviews of endoscopic surgical skills in 2003, and granted certification of skills at the trainer's level to 518 general gastroenterological surgeons, 377 urinary surgeons, 221 ob-gyns, and 49 orthopedic surgeons. Prominent efforts to treat colon cancer and gastric cancer, which represent a characteristic feature of endoscopic surgery in Japan, are also discussed in this paper.

**Key words** Endoscopic surgery, Current status of endoscopic surgery in Japan, Japan Society for Endoscopic Surgery, Skill qualification system, Cancer surgery

## Introduction

Endoscopic surgery had its beginnings around 1980 in the field of obstetrics and gynecology, particularly for fertility treatment, in Japan as well as in the West. In the field of gastroenterological surgery, Mühe reported the first laparoscopic cholecystectomy in the world in 1986, and this procedure was introduced to Japan in 1990. Since then, endoscopic surgery has been applied not only to the field of gastroenterological surgery, but also to various other fields including respiratory, urinary, endocrine, orthopedic, and pediatric surgeries. Currently, the use of endoscopic techniques in surgery, including so-called endoscopy-assisted surgery, is quite common. It would not be an exaggeration to say that the presence of endoscopic surgeries is indispensable in almost any area of surgery. The

theme of this communication is the current status of endoscopic surgery in Japan.

The details of endoscopic surgery in the various domains are left to other papers. This paper describes the development and background of the Japan Society for Endoscopic Surgery (JSES), the current status of endoscopic surgery in Japan, activities of the JSES Education Committee, and the JSES skill qualification system. In addition, characteristic features of laparoscopic gastroenterological surgery in Japan will also be described.

## Foundation of JSES and Its Background

The Endoscopic Surgery Study Group set up by Yasuo Idezuki, Tatsuro Yamakawa, and others in 1990 was the predecessor of JSES. The Study Group was reorganized and renamed JSES in

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**Table 1 Educational seminars of JSES**

1st Seminar (1998)	1) Basic procedures of endoscopic surgery: Method for accessing body cavities and expansion of the visual field 2) Recent topics
2nd Seminar (1999)	1) Prevention and measures against complications 2) Practical aspects of new procedures
3rd Seminar (2000)	1) Anatomy and expansion of operative field necessary for endoscopic surgery 2) Practical aspects of new techniques
4th Seminar (2001)	1) Basic procedures and knacks for endoscopic surgery 2) Medical lawsuits: Including informed consent
5th Seminar (2002)	1) Basic procedures, how to manage organ injury, and expansion of visual field in endoscopic surgery 2) Risks in endoscopic surgery
6th Seminar (2003)	1) Mastering procedures of hemostasis and detachment in endoscopic surgery 2) Learning from court precedents in medical lawsuits
7th Seminar (2004)	1) Skill qualification system/gastroenterological surgery 2) Skill qualification system/obstetrics & gynecology, urology
8th Seminar (2005)	Surgical procedures required for obtaining the Endoscopic Surgical Skill Qualification (gastroenterology)
9th Seminar (2005)	1) Safe use of common equipment for endoscopic surgery 2) Ligation and suture techniques under endoscopy
10th Seminar (2006)	Skill qualification in the field of general gastroenterological surgery: Review criteria and key points of scoring
11th Seminar (2006)	1) Learning endoscopic surgery using WebSurg: Recognition of eligibility for Skill Qualification Examination 2) Act on the Protection of Personal Information and surgical practice
12th Seminar (2007)	Guidelines for endoscopic surgery

1995. The rules of the society prescribe that the society should work to promote research, education and wide use, and the progress of endoscopic surgery, as well as facilitating communication among society members and with related organizations, and thereby contribute to enhancing the welfare of Japanese people.<sup>1</sup> Thus, JSES is an academic society that has connections to various scientific fields that have a common purpose of research and education in the field of endoscopic surgery. Through the efforts of the first president, Yasuo Idezuki, and the second president, Masaki Kitajima, JSES achieved rapid development and began to issue the Journal of JSES (bimonthly) in 1996. The number of members increased annually to a population of 9,389 members as of July 2008. The annual meeting of JSES became larger every year, and the 21st annual meeting of JSES was held in Yokohama, Japan, concurrently with the 11th World Congress of Endoscopic Surgery, under the leadership of the president, Seigo

Kitano, in September 2008.

In addition, JSES organized 19 committees, including the Education Committee, Academic Committee, Insurance Committee, Skill Qualification System Committee (described later), and Guidelines Committee, and has been a contributor to the rapid progress of endoscopic surgery in Japan. It is beyond doubt that JSES has played a significant role in enhancing the techniques of endoscopic surgery in Japan to a world-standard.

### **Current Status of Endoscopic Surgery in Japan According to the JSES Questionnaire Survey**

According to the questionnaire survey carried out by JSES in 2006 (responses obtained from 1,373 institutions [52.4%] out of 2,619 institutions with JSES members),<sup>2</sup> endoscopic surgery has been performed in a total of 620,896 patients comprising 357,823 cases of abdominal surgery,

**Table 2 Program of endoscopic ligation-suture technique training sessions**

Program using a box trainer (Endowork Pro II)
Basic skills practice
Q&A, troubleshooting
Lecture 1
Advanced skills practice (continuous suture, slipknots, etc.)
Lecture 2
Time contest, questionnaire, video recording, and others
Q&A, troubleshooting

130,264 of obstetrics and gynecology, 94,316 of respiratory surgery, 18,135 of urology, 12,492 of pediatric surgery, 3,170 of breast and thyroid surgery, 1,971 of orthopedic surgery, 1,408 of plastic surgery, and 1,317 of cardiovascular surgery.

Cases of abdominal surgery were predominant, and comprised 254,205 cases of cholecystectomy, 41,621 cases of small or large intestine disease (including 26,818 cancer cases), 14,941 cases of gastric disease (including 12,626 cancer cases), 10,044 cases of inguinal hernia repair, and 37,012 other cases. Cases of endoscopic surgery common in the West are surgeries of benign diseases such as cholecystectomy, inguinal hernia repair, surgery for reflux esophagitis, and bariatric surgery. However, surgery for gastrointestinal cancer has been increasing in Japan and will be discussed further.

In the field of obstetrics and gynecology, endoscopic surgery was used for the extirpation of uterine appendage tumor in 37,443 cases, intraperitoneal observation in 12,081, removal of endometriotic lesions in 11,956, surgical treatment of ectopic pregnancy in 9,570, total vaginal hysterectomy in 9,294, uterine myomectomy in 7,708, and lysis of uterine appendage adhesions in 7,739. However, the proportion of cases of intraperitoneal observation to all cases of endoscopic surgery in this field has been decreasing year by year since its peak in 1990.

In respiratory surgery, endoscopic surgery was performed in 49,634 cases of benign lung disease and 29,359 cases of malignant lung disease. The use of endoscopy in surgery of benign disease exceeded 4,000 per year in 1998 and thereafter nearly leveled off. On the other hand, endoscopic surgery for malignant disease has been increasing every year, with 4,845 cases recorded in 2005.

This may be attributable to the extended indications for cancer and an increase in the number of facilities where this technique is feasible.

In the field of urology, major cases of endoscopic surgery involved renal tubular disease in 8,504 cases (comprising 4,533 cases of renal cell carcinoma and 1,991 cases of pyeloureteral carcinoma), adrenal disease in 4,909 cases, and prostate cancer in 2,542 cases.

Endoscopic surgery in the field of pediatric surgery included 2,124 cases of appendectomy, 1,945 of inguinal hernia surgery, 1,681 of contralateral examination of inguinal hernia, and 695 of surgery for reflux esophagitis.

In breast and thyroid surgery, endoscopy was used in 1,253 cases of malignant breast disease and 1,113 cases of benign thyroid tumor, whereas the most common endoscopic orthopedic surgery was surgery for disc herniation (1,431 cases).

### Activities of the JSES Education Committee

The JSES Education Committee was organized and began functioning when JSES was set up in 1995. At first, the committee was engaged in developing “guidelines for the implementation of endoscopic surgery”<sup>3</sup> and authorizing and supporting various study group meetings and training sessions held in various locations. There were 59 authorized study groups in 2007 (15 nationwide organizations, 12 region-wide organizations, and 32 prefecture-wide organizations), and a total of 263 training sessions were held by October 2007. Educational seminar programs have been provided since 1998, to lecture on basic procedures, new procedures, medical lawsuits, skill qualification, and guidelines (**Table 1**). JSES also issued “the Terms for Endoscopic Surgery” in 1999.<sup>4</sup> In addition, training sessions of endoscopic ligation and suture techniques (**Table 2**) have been held in various parts of Japan since 2005, and a total of 46 sessions were provided to approximately 1,380 participants by November 2007. It is apparent that the Education Committee contributed greatly to the steady spread of endoscopic surgery in Japan.

### JSES's Skill Qualification System

A preparatory committee for the JSES skill qualification system was set up in 2001 during a

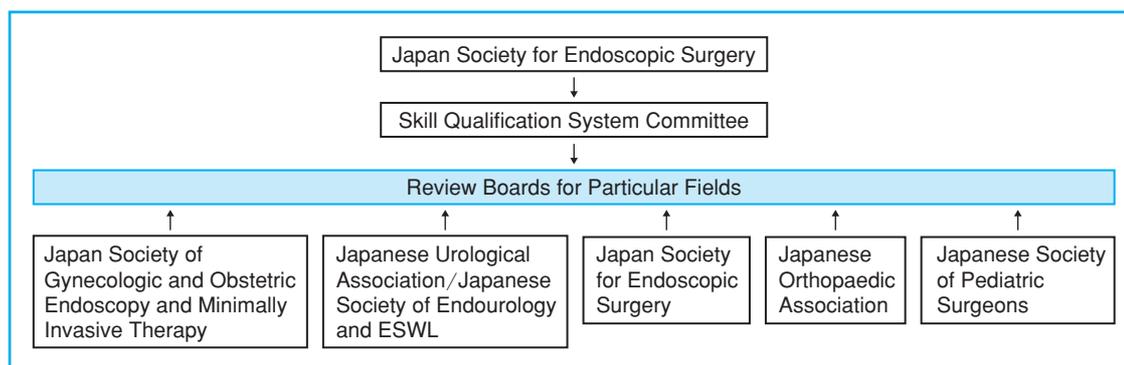


Fig. 1 Schema of the JSES skill qualification system

time when news of endoscopic surgery mishaps continued to occur. Representatives of various fields gathered in the committee to formulate the purpose, methodology, and rules of the skill qualification system.<sup>5</sup> The basic idea behind accreditation was that applicants should be surgeons specializing in particular fields and have extensive experience in endoscopic surgery, that applicant's skills be reviewed using an unedited video of an operation, and that accreditation be given to surgeons with sufficient skills to assume leadership.

The actual review was carried out by the Review Boards established under respective parent academic societies (Fig. 1). The Review Boards evaluate unedited videos of designated operations submitted from applicants according to the criteria prescribed by the Review Boards, and judge pass or fail. The first review in obstetrics and gynecology was carried out in 2003, the first reviews in urology, gastroenterological surgery and general surgery in 2004, and the first review in orthopedic surgery in 2005. Thereafter, review has been carried out annually. Initiation of accreditation review was scheduled to begin in the field of pediatric surgery in 2008. The number of accredited surgeons (and the percentage of successful applicants) in each specialty of the Review Board was 221 (72%) in obstetrics and gynecology, 377 (63%) in urology, 518 (46%) in gastroenterological and general surgery, and 49 (65%) in orthopedic surgery. The names and affiliations of doctors who obtained JSES's skill qualification can be seen on JSES's website.

A problem with the system was that the concordance rate among reviewers was low, but this

flaw has been improved on every year by having consensus conferences and changes in review criteria. Implementation of this system has been useful for the standardization of procedures and enhancing education.

### Characteristic Features of Laparoscopic Gastroenterological Surgery in Japan

As mentioned previously, it seems that laparoscopic surgery in Japan is progressing in a direction different from that in the West. More specifically, in Europe and North America, the indication of laparoscopy for cholecystectomy was followed by inguinal hernia repair, surgery for reflux esophagitis, bariatric surgery, colectomy, and others. On the other hand, in Japan, major developments were initiated in laparoscopic surgery for colon and gastric cancers, in addition to cholecystectomy. Although differences in disease distribution undoubtedly influence this discrepancy (indications of surgical treatments for reflux esophagitis and obesity are rare in Japan, while that for gastric cancer, particularly in an early stage, is relatively frequent), this may not be the only reason because laparoscopic surgery for colon cancer is more frequent in Japan than in the West, where the prevalence of the disease is higher.

There are two possible explanations. One is the manual dexterity of Japanese surgeons. The technical skills of Japanese surgeons are appreciated throughout the world, and endoscopic surgery, which has certain limitations in the use of instruments, was suited to Japanese

doctors, who were used to handling chopsticks. It may be natural that the techniques of endoscopic surgery in Japan have ranked among the highest in the world. Video presentations of surgical procedures by Japanese doctors show a higher quality of surgery than that shown by overseas doctors. With high-quality techniques serving as an impelling force, laparoscopic surgery for colon cancer, gastric cancer, and esophageal cancer have made excellent progress in Japan, centering on high-volume centers such as university hospitals and other medical centers. It is no exaggeration to say that endoscopic surgery with expansion of visual field for lymph node dissection in cancer cases is at a level no less than that of laparotomy in advanced facilities in Japan. On the other hand, endoscopic surgery was adopted for relatively easy, minimally invasive operations in the West.

The other explanation involves differences in terms of the view to cost performance in health-care between Japan and Western countries. The latter tend to place greater importance on cost

performance, and therefore seldom accept new operations if they are without merit from the viewpoint of cost. For example, if the demerits of a particular form of surgery, such as prolonged operation time, extension of learning curve, and necessary expensive equipment, are greater than the merits of the procedure, such as reduced hospital stay (decreased invasiveness), the procedure will not be widely adopted. Consequently, endoscopic surgery in these countries has become common in certain types of surgery that would offer better cost-performance (e.g., surgery for reflux esophagitis and bariatric surgery).

On the other hand, in Japan, there is a general atmosphere that anything good for patients should be promoted, and laparoscopic surgery for colon cancer and gastric cancer has been developed under such circumstances. However, to enhance endoscopic surgery for cancer in Japan to a world-standard, it is necessary to demonstrate that endoscopic surgery is also better in cost performance in terms of decreased complications and improvement of prognosis.

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