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Medium term results on introducing colorrectal laparoscopic surgery into clinical practice after having an intensive training course

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A B S T R A C T

Introduction: Endoscopic surgery has characteristics that increase the difficulties of learning. Five years ago, an intensive colorectal laparoscopic surgery course was designed to offer training in the technical bases of this type of surgery. The aim of this article is to determine the impact of the colorectal surgery course on clinical practice, and to investigate the factors that limit its applicability and the training preferences of the surgeons.
Material and methods: Twenty-two courses of four days duration, with 36hours of lessons (4 in seminar form and 32 in the surgery), and with 7 trainees, were held between June 2005 and December 2010. A survey was sent out in December 2010 to assess the impact of the course on the colorectal laparoscopic surgery activity of the trainee, to find out the difficulties encountered in its application, and to evaluate the training expectations in endoscopic surgery in this group of surgeons.
Results: The questionnaire was sent to 148 surgeons, with 74 (50%) responses received. The mean period after the course was 26.5 (2-60) months. A monthly increase of more than 5 cases was observed in 70% of the centres. The course enabled them to consolidate the activity in local hospitals, while in university and general hospitals it served to re-launch an initial experience.

Among the obstacles that made it difficult to introduce were care load and the availability of a surgeon, particularly in general and university hospitals (P=.001), and in local hospitals it was the availability of patients. The majority of surgeons (70%) believed that specific training was required, preferring a short period in a hospital with experience.
Conclusions: An intensive course on colorectal laparoscopic surgery enabled the activity to be consolidated or increased in this area. Training in colorectal laparoscopic surgery requires additional teaching efforts, which are currently unstructured..

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Resultados a medio plazo en la implementación de la cirugía laparoscópica colorrectal en la práctica clínica tras la realización de un curso intensivo

Palabras clave:
Cirugía laparoscópica colorrectal
Aplicabilidad
Entrenamiento

R E S U M E N

Introducción: La cirugía endoscópica posee características que incrementan las dificultades de su aprendizaje. Hace 5 años, se diseñó un curso en cirugía laparoscópica colorrectal para ofrecer de forma intensiva las bases técnicas de este tipo de cirugía. El objetivo de este artículo es conocer el impacto sobre la práctica clínica de un curso de cirugía colorrectal, investigar los factores que limitan su aplicabilidad y las preferencias formativas de los cirujanos.

Material y métodos: Entre junio de 2005 y diciembre de 2010 se efectuaron 22 cursos, de 4 días de duración, 36 horas lectivas (4 en forma de seminarios y 32 en quirófano) dirigidos a 7 alumnos. En diciembre de 2010 se envió una encuesta para evaluar el impacto del curso sobre la actividad en cirugía laparoscópica colorrectal del alumno, conocer las dificultades encontradas en su aplicación y evaluar las expectativas formativas en cirugía endoscópica de este colectivo de cirujanos.

Resultados: La encuesta se remitió a 148 cirujanos, obteniendo 74 respuestas (50%). El periodo medio tras el curso fue de 26,5 meses (2-60). Se observó un incremento mensual en más de 5 casos en el 70% de los centros. El curso permitió consolidar la actividad en hospitales comarcales, mientras que en hospitales universitarios y generales sirvió para relanzar una experiencia inicial.

Entre los obstáculos que dificultan su implementación destaca la presión asistencial y la disponibilidad de quirófano, especialmente en hospitales generales y universitarios (p = 0,001), y en hospitales comarcales fue la disponibilidad de pacientes. Un 70% de los cirujanos consideran necesaria formación específica, prefiriendo la estancia corta en un hospital con experiencia.

Conclusiones: Un curso intensivo sobre cirugía laparoscópica colorrectal permite consolidar o incrementar la actividad en esta área. La formación en cirugía laparoscópica colorrectal requiere esfuerzos docentes adicionales que actualmente no están estructurados.

Introduction

Endoscopic Surgery (ES) has become the approach of choice for a number of interventions in General and Digestive Surgery, as well as in other specialities (thoracic surgery, gynaecology and urology). ES has some features that are particularly difficult to learn. Firstly, a technological infrastructure under continuous development is essential for it to be implemented. In addition, because ES is performed away from the surgical field and controlled by a two-dimensional screen, the learning process for mastering the necessary skills to carry out this type of surgery safely is a long one. It is generally considered that between 30 and 100 interventions are required for surgeons to acquire the proper expertise in advanced procedures (e.g. colectomy, bariatric surgery), which is far from the educational capacity of the majority of teaching surgical units.[1-4] Proof of this difficulty is the limited application of ES in some areas, and more specifically in the case of colorectal surgery, despite clear demonstration of its clinical advantages.[5] This has resulted in the emergence of different training models aimed at alleviating this lack of educational resources.[1,6-8] An intensive laparoscopic colorectal surgery course was designed in our hospital 5 years ago to provide the necessary surgical techniques. However, teaching requires intellectual input from the teaching team and there is a consequent economic cost, so evaluating it is a good idea. We designed a survey to determine the impact of this course on clinical practice. At the same time, the factors limiting the applicability of this technique and training preferences of the surgical community were also investigated.

Material and methods

Between June 2005 and December 2010, 22 laparoscopic colorectal surgery courses were carried out at the Hospital de Sant Pau. These theoretical and practical courses lasted 36 hours over 4 days, with 4 hours of seminars and 32 hours shadowing surgeons in the operating room. Each course was designed for 7 students, and an average of 9 patients were operated upon. The course was equivalent to 8.7 credits of continuing education by SEAFORMEC. During this period,

148 surgeons attended the course, all with basic training in laparoscopic colorectal surgery (75% of the trainees had been involved in less than 40 laparoscopic colectomies). In December 2010, an e-mail survey was prepared and sent to assess the impact that the course had had on laparoscopic colorectal surgery at the centre (Appendix 1). The survey was also intended to find out the difficulties encountered by students in applying these techniques at their centres and their expectations on the endoscopic surgery training. The survey results were stored on an Excel file, and basic statistical tests were performed (the chi-square test,[2] Student's t-test).

Results

The survey was sent to 148 surgeons, and 74 (50%) responded. The average period following completion of the course was 26.5 months (2-60). The general characteristics of respondents regarding age, sex, years of experience and post held at the hospital are summarised in Table 1.

Table 1 – General characteristics of the survey respondents

Demographic		
No.		74
Sex, m/f		52/22
Age, years	30-40	30
	40-50	17
	50-60	27
Type of hospital		
University hosp. (756 beds)	39	53%
General hosp. (466 beds)	13	17%
District hosp. (209 beds)	19	26%
Surgeon's post		
Head of unit	14	18%
Head of section	8	11%
Head of residents	52	70%
Previous experience in laparoscopic colorectal surgery		
None	14	18%
Some (<40 cases)	44	60%
Moderate (40-100 cases)	15	21%
Expert (>100 cases)	1	7%

The overall subjective assessment of the course by the students was positive, with a score of 4.8 out of 5. When assessing the direct impact of the course on laparoscopic colorectal surgery at the hospital, there was an increase of more than 5 cases per month in 70% of the centres (Figure 1). The course helped improve some initial experience in 39% of the respondents, and consolidate existing experience in 29% (Figure 2). The course was noted to have helped consolidate the activity in smaller (district) hospitals, while boosting initial experience in university and general hospitals.

The survey was also aimed at finding out any possible difficulties in the development of laparoscopic colorectal surgery. The obstacles to implementation in hospitals according to the opinion of the respondents are described in Table 2. The most notable difficulties were excessive workload and operating room unavailability. When these factors were analysed by the type of hospital, it was observed that the workload and operating room unavailability were the major difficulties in general and university hospitals (P=.001), while the biggest problem in district hospitals was the availability of suitable patients for the technique. The same results were also observed depending on the whether there was a specific colorectal surgery unit or not, as the difficulty of conducting this type of surgery increased where a unit existed.

Lastly, the need for specific training in laparoscopic colorectal surgery was evaluated. A high percentage of surgeons (70%), irrespective of their age, type of hospital or post held at the hospital, felt the need for specific training in this type of surgery, preferring a short stay in a hospital with experience (Figure 3).

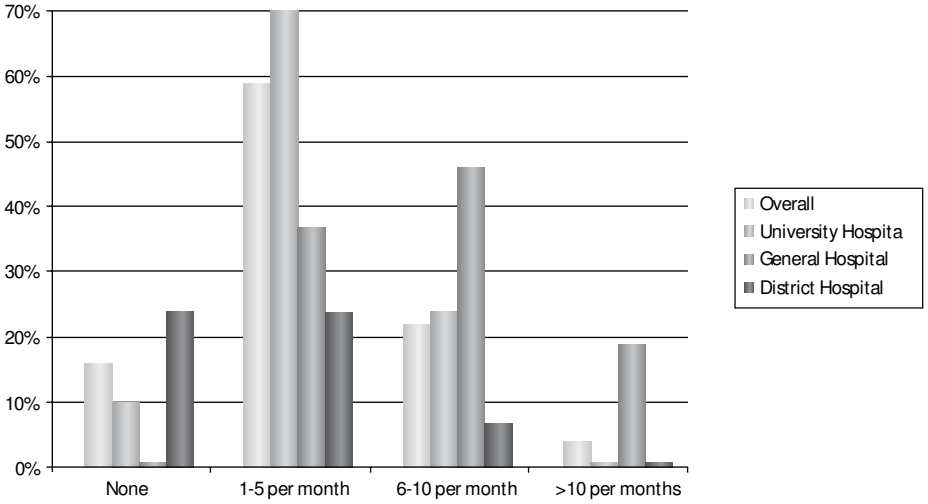

Figure 1 – Course impact on normal activity: Increase in the number of cases undergoing laparoscopy.

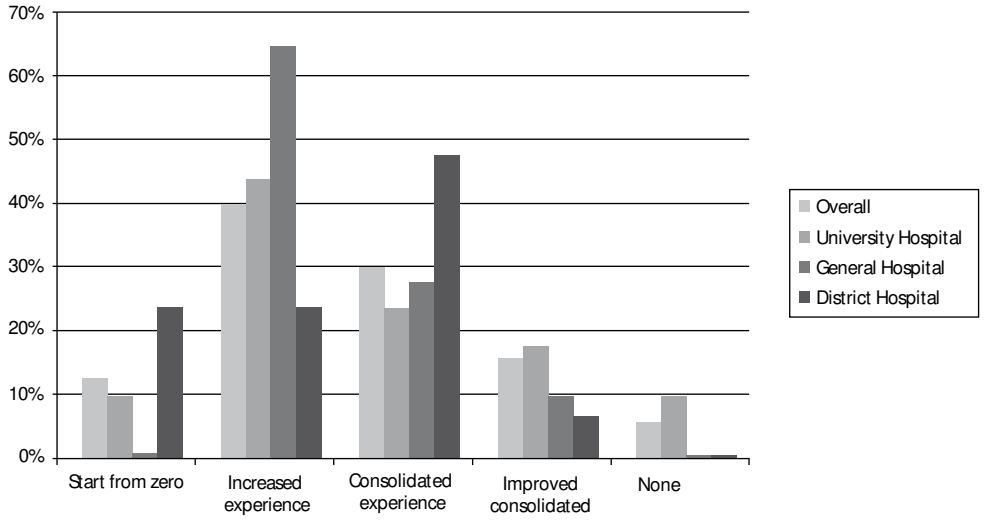

Figure 2 – Course impact on laparoscopic colorectal surgery.

Table 2 – Technical barriers to the implementation of laparoscopic colorectal surgery

	Overall	University		General		District	With CRSU		Without CRSU
None	9%	3%		0%		18%	4%		21%
Lack of patients	14%	11%		0%		33%	8%		32%
Workload	57%	71%	P=.001	64%	P=.001	35%	70%	P=.001	26%
Operating room availability	25%	34%		27%		12%	34%	P=.001	5%
Adequate operating room	6%	11%		0%		0%	4%		10%
Lack of hospital support	11%	20%		0%		0%	15%		0%
Lack of support from anaesthetists	9%	9%		9%		12%	13%		0%
Lack of support from nurses	3%	6%		0%		0%	4%		0%
Other	23%	23%		36%		18%	25%		21%

CRSU indicates Colorectal Surgery Unit.

Discussion

The increased difficulty in surgical training has become apparent in recent years. The problem arises when increasingly complex surgical techniques need to be implemented in an environment that limits the time available for surgical training. Indisputable proof of this difficulty in advanced ES training is the current slow implementation of these techniques in surgical practice. Although the implementation of laparoscopic cholecystectomy can be considered universal, and hiatal surgery is performed in a high percentage of cases, the use of laparoscopy for indications considered *advanced* (adrenalectomy, splenectomy, colectomy) did not exceed 15% of cases in the US during the last 10 years, despite the high level of evidence confirming its clinical advantages.[5]

Specific advanced ES training has been an important challenge for two decades now.[1,6-8] The different training methods developed are of a varying educational value. In fact, many of them have been criticised for being overly expensive and of limited educational value, while initially leading to a considerable incidence of complications and adverse effects.

The type of training has followed two different paths either side of the Atlantic. In the US, the need for this type of specific postgraduate training was quickly identified, consolidating the ES fellowship model.[9] The ES fellowship has become the most sought-after fellowship, with more than 110 programmes at present. The practical utility of fellowships has been demonstrated in various ways, being highly valued when employing new hospital staff. It has also been proven that physicians with specific ES training are able to perform various techniques (e.g. bariatric, colorectal) more rapidly and safely.[10,11] There has been no similar policy at the European level, and no European scientific society has proposed or developed standard models at the European level. Only the UK has promoted a national training and accreditation programme for laparoscopic colorectal

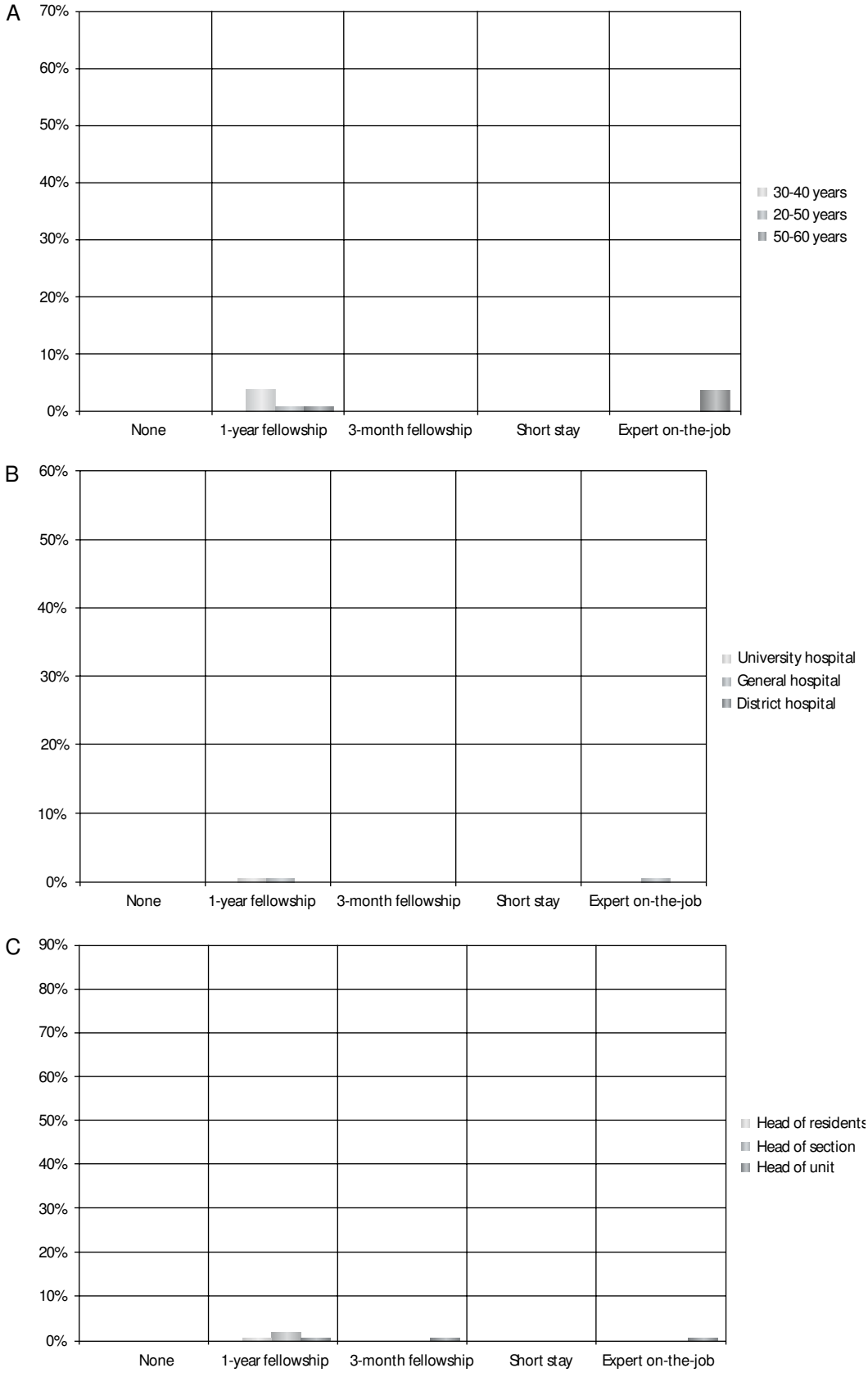

Figure 3 – Additional training in laparoscopic colorectal surgery. According to: A) Age of respondents, B) Type of hospital; C) Hospital post.

surgery,[12] after analysis by the National Institute for Clinical Excellence (NICE) demonstrated difficulties associated with providing laparoscopic colectomy training as well as its clinical benefits.

In Spain, the structured, university-based training proposals have been few (Madrid, Seville, Santiago de Compostela). The Spanish Commission for this speciality amended the speciality syllabus in May 2007, including two core courses during residency, and entrusted its development and coordination to the Spanish surgeons association (AEC) and the Endoscopic Surgery Section.[1,7,13] At the same time, the Endoscopic Surgery Section runs an annual course in Castellon, attended by only 30%-40% of the highest achieving fifth year Spanish residents, due to limited space and budget. However, despite the fact that information about the results is already available for one of these programmes, there remains the feeling that not enough technical training is done in the operating room.[14] Several authors in Spain have submitted proposals to resolve or expedite a solution to this problem. Suñol et al[15] and Tobalina et al[16] showed that systematic training in laparoscopic colorectal surgery, by forming teams of a trained surgeon and trainee, with the trainee becoming the trainer once trained, promotes safe and progressive, continuous learning. This method involves disciplined decision-making and political consensus in the unit, as well as the logical discipline of the team to ensure complete and evaluated technical efficiency. Balen et al[17] proposed a different method, similar to the intensive US fellowship or mini-fellowship course (a trained surgeon temporary stays at a centre with extensive experience), which significantly improved results for this type of surgery after returning to his/her surgical team.

The survey results confirm some of the previously discussed observations: an intensive course model is effective in improving and consolidating this type of activity; there is a need for specific training in laparoscopic colorectal surgery; and even today there are obstacles to the implementation of these techniques.

One especially interesting result of this survey was that intensive exposure of a limited group of surgeons to a large number of laparoscopic procedures in a short period can improve or consolidate existing experience. The exchange of information, the detailed observation of the surgical steps and repetition of the manoeuvres enable surgeons with some initial experience to overcome difficulties or readily resolve applicable problems when resuming routine surgery. Interestingly, these courses have helped improve initial experience in hospitals considered 'large' (general hopitals: 64%, university hopitals: 43%), and have consolidated the technology in a greater number of cases (47%) in district hospitals. This explains a common observation that ES is adopted more readily by smaller hospitals than larger ones, which are more hierarchical, less flexible and less adaptable to these techniques. This observation leads to the general opinion that, regardless of age, type of hospital or hospital post, there is a need for specialised training in laparoscopic techniques, that current resident training or self-training in hospitals cannot achieve. The information emerging from the survey is that a short stay in a hospital ensuring continuous practice is the most attractive formula for improving laparoscopy in centres where this type of surgery is under development. This situation may be temporary and there may be no need for additional training, once various centres have appropriate education and training or the next generation of residents has sufficient training. However, it is notable that 80% of the younger respondents (30-40 years) expressed the need for additional training.

Finally, the survey results confirm that there are still difficulties implementing these techniques in Spanish hospitals. Although this is for a number of reasons, it is worth noting that some 'traditional' issues (such as technological capacity of the operating room, assistance from anaesthetists or nurses) are not in fact obstacles in most cases. This confirms that laparoscopic techniques are generally accepted, but the pressure of waiting lists and operating room unavailability hinders its implementation. This is probably circumstantial and derived from an objective fact, such as the longer duration of laparoscopic interventions compared with open surgery. However, this is associated with the steep learning curve which, once overcome, leads to interventions only slightly longer than open surgery. In addition, the appropriate selection of patients can optimise and facilitate the surgery schedule, thereby increasing the number of laparoscopic operations performed.

This survey has its weaknesses, of course, but it is of value. The responses are from a small proportion of Spanish surgeons, however, these surgeons were previously selected as the most motivated in developing this technique. The responses therefore are more representative of the national reality. Moreover, the response rate of 50% is high if compared to similar surveys,[18,19] which reinforces the validity of the results.

There are 3 main conclusions of this study: 1) An intensive course in laparoscopic colorectal surgery consolidates or increases this type of surgery in a surgical team; 2) Training in laparoscopic colorectal surgery requires additional efforts which are not currently scheduled; and 3) The next decade must provide appropriate training to take advantage of the potential benefits of these technical options.

Conflict of interest

This study was a collaboration between the Hospital de Sant Pau Surgery Department and Ethicon Endosurgery for training in advanced endoscopic surgical techniques.

Appendix A.

A.1. Survey

1. Personal and occupational details of the trainee
Date of course: / /
Age/sex
Hospital post
Hospital
University hosp.
General hosp.
District hosp.
Number of beds
Presence of specific colorectal surgery unit
What level of experience in colorectal laparoscopic surgery did you have before the course?
None
Some (<40 cases)
Moderate (40-100)
Extensive (>100)

2. Colorectal surgery at your hospital
Number of colectomies/year
Laparoscopic interventions …%
Before the course …%
Currently …%

3. How would you rate the training course you received a few months ago?
Very interesting
Interesting
Poor
Very poor

4. What is the degree of implementation of the techniques learned in your daily work?
Very high
High
Low
Very low

5. How has this course helped you in your daily work?
To start this type of surgery
To improve on initial experience
Consolidate experience gained to date
Improve certain aspects of experience gained to date
Has not helped

6. How many more procedures using these techniques can you now do in a month?
0 (no increase)
5 per month
Between 5 and 10 per month
>10 per month

7. What problems have you come across when implementing laparoscopic colorectal surgery at your hospital? (Choose more than one, if required.)
Few eligible patients
Excessive workload
Low availability of operating rooms
No technically adequate surgeons available
Lack of collaboration/support from the unit
Lack of collaboration/support from the anaesthetists
Lack of collaboration/support from nursing staff
Others (indicate)

8. Training needs: Having completed the course, from your current experience, what do you believe is the current laparoscopic colorectal surgery training method?
Current practice is sufficient
Intensive fellowship of 1 year
Short fellowship of 3 months
Short stay in a hospital
On-the-job training at my hospital with an expert

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