



Special Article

Training of Residents in Abdominal Wall Surgery in Spain[☆]

J.M. Miguelena Bobadilla,^{a,*} D. Morales García,^b X. Serra Aracil,^c
 M. Sanz Sánchez,^d I. Iturburu,^e F. Docobo Durántez,^f J.M. Jover Navalón,^g
 I. López De Cenarruzabeitia,^h E. Lobo Martínezⁱ

^a Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Miguel Servet, Zaragoza, Spain

^b Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Marqués de Valdecilla, Santander, Spain

^c Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Corporación sanitaria Parc Taulí, Sabadell, Barcelona, Spain

^d Unidad de Cirugía, Sección de Formación posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Gregorio Marañón, Madrid, Spain

^e Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Basurto, Bilbao, Spain

^f Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Virgen del Rocío, Sevilla, Spain

^g Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario, Getafe, Madrid, Spain

^h Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Clínico Universitario, Valladolid, Spain

ⁱ Unidad de Cirugía, Sección de Formación Posgraduada y Desarrollo Profesional Continuo (D.P.C.), Hospital Universitario Ramón y Cajal, Madrid, Spain

ARTICLE INFO

Article history:

Received 31 May 2011

Accepted 29 August 2011

Available online 2 July 2013

Keywords:

Surgical training

Surgical residents

Surgical wall

Hernia surgery

A B S T R A C T

The training of residents in abdominal wall surgery is a fundamental aspect of surgical training, representing globally 20% of its activity.

In this paper, we analyze the current state of resident training in this kind of surgery in Spain, taking into account the broad spectrum it covers: general services, specific functional units, ambulatory surgery programs.

To do this, based on the specifications of the specialty program, specific data were used from several different sources of direct information and a review of the results obtained by residents in hernia surgery.

In general, our residents agree with their training and the recorded results are in line with objectives outlined in the program. However, it would be important to structure their teaching schedules, a rotation period in any specific unit and their involvement in outpatient surgery programs.

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[☆] Please cite this article as: Miguelena Bobadilla J.M., et al. Consideraciones en torno a la formación del residente en cirugía de pared abdominal en España. Cir Esp. 2013;91:72-77.

* Corresponding author.

E-mail address: jmmibo@unizar.es (J.M. Miguelena Bobadilla).

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Consideraciones en torno a la formación del residente en cirugía de pared abdominal en España

RESUMEN

Palabras clave:

Formación quirúrgica
Residentes cirugía
Cirugía de pared
Cirugía herniaria

La formación del residente en cirugía de la pared abdominal constituye un aspecto fundamental en la formación quirúrgica, representando globalmente un 20% de su actividad.

En el presente artículo, se analiza el estado actual de la formación del residente en este tipo de cirugía en España teniendo en cuenta el amplio espectro en el que se desarrolla: servicios generales, unidades funcionales específicas, programas de cirugía mayor ambulatoria.

Para ello, partiendo de las especificaciones del programa de la especialidad, se han utilizado datos concretos obtenidos de diversas fuentes de información directas, así como una revisión de los resultados obtenidos por los residentes en cirugía herniaria.

En general los residentes en nuestro país manifiestan su conformidad con la formación recibida, y los resultados objetivos registrados se adecuan a los planteados en el programa. Sin embargo, sería importante estructurar en sus itinerarios docentes, un periodo de rotación en alguna Unidad específica y su implicación en programas de cirugía mayor ambulatoria.

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Introduction

The MIR (Spanish acronym for *resident intern physician*) training system is based on the proper coordination of its three fundamental pillars: the program, accredited departments and tutors. If this is achieved, homogeneously and regardless of the training center, its main objective will be reached: to transform a licensed medical doctor into a specialist, with the ability to further complement or complete his/her training in a specific area.¹

Abdominal wall surgery is an essential aspect of surgical training for two fundamental reasons. First of all, because of the frequency of hernia disease in all surgical departments, which is estimated at 4.09% of general surgery in France² and represents 20% of gastrointestinal tract interventions. Secondly, it is currently a common surgical procedure that still originates an important number of early- or late-onset post-operative complications, which can occasionally be severe, and are related to different degrees of dehiscence requiring in some cases specific surgical treatment. This continues to be true even after the advent of minimally invasive surgery. Access to the abdominal cavity by means of different types of conventional laparotomies in general surgery as well as in other surgical specialties, continues to be common, either as an elective or emergency procedure.

Although to a lesser degree, conventional laparoscopic, SILS or hand-port approaches are not complication-free.

The resident training program for the specialty³ sets training objectives that are similar to those of the *European Board of Surgery*,⁴ and defines the final product of knowledge, abilities and skills that residents should acquire and develop in order to work within the specialty from a scientific, modern perspective instead of mere technical skill.⁵

Nonetheless, it is difficult to analyze and compare surgical training programs in different countries in general or in specific aspects because there are few references in the literature.⁶

In this context and in order to bridge this gap, the *Surgical Council On Resident Education (SCORE)* project in the US has been developed by the leading American surgical organizations (A.B.S., A.C.S., A.S.A., A.P.D.S., A.S.E., R.R.C.-S) with the aim to homogenize and perfect the surgical training of their residents.^{7,8}

Regarding abdominal wall surgery, the program defines the theoretical knowledge that should be incorporated and integrated in the specific training itinerary. To this end, it proposes a series of training courses, preferably approved by the Spanish Association of Surgeons, for different periods of residency: a course on abdominal wall and hernias in the third year of residency (R3) and major ambulatory surgery (MAS) in the second year (R2). The compliance with these courses should be promoted by the Teaching Unit, and its activities and methodology should include some specific procedure for evaluation.

A program to be highlighted is the inguinal hernia surgery course at the Hospital Universitario in Getafe (Madrid) based on an approach to surgical anatomy with cadaver workshops. This is followed by a review and update on the main surgical techniques using live interventions and directed roundtable discussions.

There is, however, a deficit in the number of specific courses offered with these characteristics (and with no conflict of interests) about laparoscopic hernia and ventral hernia surgery.

In our country, abdominal wall surgery is performed safely and effectively both in general surgery departments and in structured departments with an Abdominal Wall Surgery Unit. The residency program does not include a specific period of rotation related to abdominal wall pathology.

In addition, an important percentage of hernias, are treated in the emergency surgery setting due to complications, as has been previously reported.⁹ This context can distort the residents' knowledge about anatomic planes and the systematization of surgical techniques, especially in the early training period.

Furthermore, hernias are one of the main diagnoses included in MAS programs, with the technical and management implications that these procedures entail. The participation of residents in hospital overtime programs would also effectively contribute to their training.

Although these considerations are easily applicable to hernia surgery, the same is not true for ventral hernia surgery, including those originating in other surgical specialties. This surgery, which is technically demanding and meticulous, is occasionally performed in a not sufficiently regulated way, and the residents may not have adequate training.

Therefore, adequate tutoring and training in abdominal wall closure starting in the first year of residency would be positive. The structuration of a specific training process would be organizationally complex, but this could be substituted by different types of training in the skills laboratory and in experimental surgery.^{10,11}

Training in Endoscopic Surgery

Laparoscopic surgery of hernias and ventral hernias is often done by staff surgeons in specific abdominal wall units or in departments or units with an important involvement in laparoscopic surgery and at different points of the learning curve. This displaces the surgery residents themselves or those from other departments or units from learning these techniques; in addition, the surgeons and units that frequently and systematically perform these techniques are still a minority.¹²

The European Hernia Society (EHS) has published clinical guidelines¹³ that postulate that: (a) the learning curve for endoscopic techniques in hernia surgery is significantly longer than for the Lichtenstein technique, ranging between 50 and 100 procedures, the first 30-50 of which are the most critical (level of evidence 2C); (b) it recommends (grade C) that training in these techniques should be done in specialized centers or units instead of in general surgery departments, or even in specific abdominal wall units; (c) it recommends (grade C) that training in these techniques should be initiated with properly tutored residents, as the learning period would be shorter.¹⁴

It also suggests that it should be a priority to propose and promote specific accredited courses that include specific practical activities that are reproducible, controllable and evaluable, using more or less sophisticated simulators.^{11,15,16} At the same time, such activities should be made available in accredited teaching surgical departments.

Another question to be considered is whether to include these "advanced" techniques in the objectives of resident training programs and rotations while taking into account the time limitations and competences of the specialty, at the dawning of the new era of basic surgical and specific training areas.

Implications for Major Ambulatory Surgery

As mentioned previously, another variable to consider in the analysis of the resident training program is the involvement of MAS units and programs in this type of disease. These units

deal with a large spectrum of diagnoses and consequently displace an important volume of abdominal wall surgical activity; *a priori*, this has important repercussions in surgical training.

Nevertheless, it must be kept in mind that these units usually treat selected patients in standardized programs. The structured participation of residents in such programs, as well as during their specific rotations, is probably one of the most adequate and convenient aspects that could be included in hernia surgery training.

The increased rate of MAS substitution and the progressive tendency for these procedures to be done in specific autonomous hospital units (which may be in the same hospital where the resident is assigned or in a different one) often conditions the limited participation and structured involvement of surgical residents in these programs.

Another aspect to be considered is that the start-up of the MAS units required that all MAS personnel have sufficient expertise, in order to increase efficiency.¹⁷ This could initially limit the involvement of residents in these programs.

In a survey of opinions about MAS rotations during residency,¹⁸ all those surveyed considered that MAS should be included as part of resident training for time periods of more than two months. Likewise, 53.8% of those surveyed said that this rotation should take place within the first three years of residency; 19.25% said the rotation should take place regularly throughout the entire residency period.

In general, there is consensus about considering MAS units or day hospitals as mandatory points of reference for training residents in hernia surgery. This is due to the fact that, even though they usually lack specific training programs, the volume of cases and the possibility for proper tutoring by expert surgeons meet the training objectives in this area with regard to the number and type of procedures.¹⁹⁻²¹ The increased cost per process²² caused by the increased surgical time would be outweighed by the contribution to the training program.²¹

It would then seem logical to involve surgical residents in an organized manner in MAS programs, both in order to learn about the clinical management of these units as well as to actively and progressively participate in surgical training.

Are the Program Objectives Met?

One of the fundamental problems that arise in the evaluation of an educational program is determining whether it meets its objectives. In general (and recognizing its limitations), the most often used method in the different training systems and programs is a registry of the surgical interventions done by the resident as surgeon and assistant controlled by the tutor.²³ In our country, the quantification of the activities proposed by the official program in the *Residency Manual* is still currently an appropriate model.

The program defines the minimum number of procedures that the residents should perform over the course of their residency in abdominal wall surgery: 25 inguinal-femoral hernia repairs; 5 umbilical hernia repairs; 10 ventral hernia surgery.

A study by the Royal College²⁴ about teaching surgical residents in the south of England concluded that, on average, the residents had assisted in 8 surgical hernia procedures and had been supervised as surgeons for another 9 procedures before operating without supervision. In addition, 79% of the residents felt adequately prepared at the time of their first unsupervised operation.

In other countries,^{2,12,23} reports have been published of 9 surgical hernia procedures done per year of residency in the respective training systems. In the US,²⁵ the average is 50 open and 7 laparoscopic procedures before the end of residency.

At the 9th Congress of the Abdominal Wall and Sutures section of the Spanish Association of Surgeons (SAS): Hernia 2007, the following conclusions were obtained regarding training in hernia surgery. In general, by the end of their training, residents should: (1) know the indications, results and complications of the different techniques; (2) not necessarily know how to do all the techniques, but have acquired the best theoretical knowledge, capability for decision making, technical abilities and skills necessary to deal with abdominal wall pathologies; (3) consider themselves prepared to deal with this pathology without problems in a regional hospital.

In theory, these affirmations are optimistic. They were endorsed by the results of a national survey done by the Postgraduate Training Section of the Spanish Association of Surgeons²⁶ aimed at residents. The questions included the number of abdominal wall interventions done during residency. The average was 85, which greatly surpasses the provisions of the program. It also concluded that 76% of the residents surveyed approved and felt satisfied with the level of training acquired.

On the contrary, in the satisfaction survey at the hernia course offered every year at the Hospital Universitario in Getafe, 80% of the residents consider that the teaching of hernia surgery is not good in their respective departments, even though in 92% they are supervised by attending surgeons. 100% think that the course is interesting and 98% state that the course had stimulated their interest in hernia surgery. Furthermore, 100% consider that the course was positive for their education.

In the results published from a study about the surgical training of residents in the autonomous community (province) of Valencia,²⁷ it was observed that the residents presented a greater level of involvement in emergency surgical procedures than in scheduled procedures, as had been previously published.⁹

Results of Hernia Surgery Performed by Residents

Currently, even though there generally seems to be an evident higher cost per procedure when residents are involved^{22,28}, these repercussions would be greatly compensated by the positive impact of the teaching aspects in accredited teaching surgical units. However, the question that needs to be answered is whether the results of procedures performed by residents have a quality comparable to those obtained by staff surgeons, and whether they meet current standards for complications, recurrence and operating time.

Cueto et al.²⁹ analyzed and studied the influence of the degree of experience of the surgeon in inguinal hernia surgery using the Lichtenstein technique. The surgical team variable was distributed into three groups: senior surgeon-experienced resident, experienced resident-senior surgeon, experienced resident-junior resident (supervised by the senior surgeon). During a two-year follow-up period, the evaluation criteria were: hospital stay, morbidity, work missed, pain and recurrence. The study concluded that the results obtained were similar in the three groups; the only significant difference found was a shorter operating time in the first group.

In a prospective study with 1983 patients who underwent inguinal hernia surgery, Wilkiemeyer et al.³⁰ randomized the cases into two groups for either conventional or laparoscopic treatment. They evaluated the influence on the results (recurrence, complications and operating time) of the training levels of the surgical residents who acted as surgeons under the supervision of a senior surgeon. There was evidence of a higher rate of recurrence after two years in the group of patients with conventional surgery who were operated on by residents with less training compared with the group of patients operated on by more experienced residents. Furthermore, the same groups presented longer operating times, both for conventional surgery as well as for laparoscopy, than the times obtained by the group of residents with greater experience.

A ten-year audit on the results of Lichtenstein hernioplasty performed by supervised residents concluded that it was safe with regard to premature complications and recurrence rates.³¹ Likewise, in a prospective study³² comparing the results for recurrence and post-operative pain between supervised residents and experienced surgeons, no significant differences were found.

The EHS guidelines¹³ corroborated that there was no evidence of a greater number of complications in the patients operated on by residents or by experienced surgeons (level 2C), as long as the former had adequate supervision and the latter had adequately selected the patients.

These data lead to the conclusion that, although training in hernia surgery should be initiated early on and in different settings within the educational itinerary of surgery residents, it should be methodical and with the assumption of progressive levels of responsibility. Supervision by a senior surgeon is essential to obtain the best clinical results and achieve shorter operating times.

Final Considerations

In our opinion, resident training in abdominal wall surgery in our country seems adequate and, although the required number of cases included in the program of the specialty seems *a priori* insufficient, our residents in general greatly surpasses this standard. Modifications to the program should be contemplated in a review in the near future, and the program should be updated by the National Commission of the specialty.

In the educational itinerary of each resident, it is important to promote, organize and specify a period of rotation in a

specific abdominal wall unit in an associated regional hospital as well as involvement in MAS programs with progressive degrees of responsibility.

Moreover, training should be initiated from the beginning with systematic, rigorous learning of the general principles of the surgical techniques of laparotomy and its closure, as well as the concepts of closure without tension and abdominal compartment syndrome. These techniques should be understood, assimilated and practiced progressively, first as an assistant and later as a tutored surgeon in emergency and elective surgery.

Structured involvement of surgical residents in MAS programs should be promoted in order to learn about clinical care and management of these surgical units and to promote active, progressive surgical training.

Laparoscopic surgical training in these techniques and in preperitoneal techniques should be initiated in departments and/or specific units and courses that have been accredited by the SAS or EHS.

The Spanish Association of Surgeons, initiated by the involvement of the abdominal wall and sutures training and MAS sections, has proposed a catalog of procedures that residents should know how to do, should have seen done and should have done by the end of their residency. This will contribute to perfecting the definition of the residency training program objectives and to optimize the training of new surgeons in this area.

It is possible that after the publication of the decree on branches of surgical specialties and the definition of itineraries for access to specific training areas, it will be the moment for the National Commission of the specialty to propose, modify and redefine new rotation periods, objectives and assessment methods in conventional and laparoscopic abdominal wall surgery.

Some of the considerations expressed in the present paper have been based on the study and analysis performed by the authors as the result of a proposal by Dr. F. Carbonell Tatay, for the publication of a book on abdominal wall surgery. The authors would like to thank the editor for the authorization to present this article.

Conflict of Interests

The authors declare having no conflict of interests.

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