

# Evaluation of a workshop to teach a new surgical technique in abdominal wall reconstruction

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## Introduction

During the past 10 years the surgery of the abdominal wall has undergone great changes with the description of the posterior components separation techniques [1,2], especially with the technique of transversus abdominis release (TAR)[3]. The TAR has become a landmark in AWR and it is widely used nowadays, including laparoscopic or robotic approach [4,5]. We had the opportunity to learn and employ this technique since the year it was described.

Increasing confidence in TAR amongst abdominal wall surgeons has fed a desire for high quality training in the theoretical and technical principles of this approach prior to offering these techniques to their patients. The target audience for this type of training remains senior surgeons with wide experience in complex abdominal wall surgery who are looking to improve outcomes in the most difficult cases. This paper describes the results of the development and implementation of one of the first training experiences in TAR and its effect on implantation of TAR in Europe.

## Material and methods:

We offered the first European comprehensive training course in TAR. Since July 2013 we perform a workshop of complex abdominal wall problems. The workshop was performed at the Henares University Hospital, which has an educational collaboration program with Francisco de Vitoria University. Our hospital is a 250-bed facility located in the periphery of Madrid. It belongs to the Spanish National Health Service and serves a population of 170,000 people. The operative team of the Department of Surgery comprises 12 surgeons with specialization in general and digestive surgery. Five surgeons of the team are involved in the management of the complex abdominal wall and all of them have broad experience in TAR. We perform the TAR with some slight modifications that we have previously published [6]. The hospital receives patients with complex abdominal wall problems from all over the country. Our department performs more than 50 complex abdominal wall procedures every year.

The length of the workshop is 23 hours and it is accredited by “Comisión de Formación Continuada de las Profesiones Sanitarias de la Comunidad de Madrid-Sistema Nacional de Salud” (a Spanish accreditation council for continuing medical education) with 3.5 continuing medical education credits. W. L. Gore & Associates S.L. supported the workshop and selected the attendees.

Ten to twelve surgeons attend each course. The workshop is done in two days. The first day begins with two lectures; one about surgical anatomy of the abdominal wall, and the second about the general management of the complex abdominal wall problems. After that, the course continues with live surgery. In two different operating rooms we perform simultaneously 2 or 3 complex abdominal wall surgeries. The attendees are allowed to stay in either theatre after their preferences and they can change when they want. Each of the surgeries is retransmitted to a screen inside the theatre. The attendants can follow the surgery from the screen or looking directly at the surgical field.

Patients are informed before surgery that they will be operated during a workshop. All patients sign an informed consent form.

After the surgeries, in the afternoon of the first day, the course continues with lectures consisting of presentations and video-based education sessions: meshes for AWR, preoperative optimization of patients, approach of complex midline incisional hernias, approach of complex lateral hernias and temporary closure of abdominal wall. In these lectures we describe the different options in the treatment of complex abdominal wall problems, focusing on TAR. These educational sessions follow the concept of updated reviews for each technique, case selection, relevant anatomy, technical operative steps and potential pitfalls. The didactic video sessions show the key aspects of the dissection and all the tips and tricks of the TAR. The duration of each of the lectures is about 30 minutes and after each of them there is a time of discussion with the participants. All videos that we use have been edited by the faculties. All are videos of surgeries and cadaver dissections performed by the faculties.

On the second day the trainees perform a cadaveric dissection in a frozen cadaver. Before starting the hands-on cadaver dissection, we show a video on how to perform, step by step, the cadaver dissection and the fundamental anatomical aspects to perform a TAR. After this, the cadaveric dissection is performed under the surveillance of a faculty. Time allocated to technical skills training in the dissection room was not strictly limited, so that trainees could develop their skills at their own pace. There was a cadaver for every two trainees, so that each trainee could perform a TAR on one side of the abdominal wall of the cadaver. The trainees to faculty ratio was kept strictly at 2:1. Faculty ensured that the key steps of the procedure were followed in sequence: Identification of the posterior rectus sheath, dissection of the retrorectal space, identification of the linea semilunaris and the neurovascular bundles, identification of the linea arcuata, dissection of the Bogros and the Retzius spaces, identification of the inguinal nerves, dissection of the Conze's fatty triangle, section of the posterior rectus sheath to perform the TAR, lateral extension of the dissection to psoas muscle and quadratus lumborum, dissection of the sub-diaphragmatic area, and periumbilical perforation sparing anterior component separation. A form was filled with all the technical details that should have been followed. A 90% of anatomical details must be achieved to pass the evaluation of the workshop in order to obtain the credits of continuing medical education.

Feedback from the trainees was collected at the end of the workshop with a survey in which they had to assess the different aspects of the course. In this survey, in addition to a numerical assessment of the different parts of the course, an assessment of the weaknesses and strengths of the workshop was requested.

An online survey (Survio©; <https://www.survio.com/es>) was designed to know the influence of our workshop on the clinical practice of the attendees (Table 1). The answers of two of the questions are numeric. One question has multiple answers and the attendant had to choose one of them. Other is an open question. And the rest questions are of binary answer (Yes/No). A link to the web page containing the survey was disseminated to attendees via email. The survey remained open for 5 months (26 February to 27 June 2018).

## Results

At the time of writing, 210 surgeons attend to one of the 20 editions of our workshop. One hundred and ninety two attendees from the first fifteen courses (all surgeons attended the course more than one year ago) were included in the present data analysis. The courses attracted surgeons from 12 different countries from Europe, Africa and Middle East especially from Spain, Italy, United Kingdom and Germany. Attendees had previous experience in abdominal wall surgery. The workshop was rated high and attendees felt that their objectives had been met and overall were very satisfied with their experience (Table 2). One of the most appreciated features of the workshop is the combination of the theoretical part with the live surgeries and the cadaver lab. The cadaver dissection is considered by most surgeons to be very important since it allows a better understanding of the dissection, the anatomical details and the tricks of the surgery and makes the surgeon feel more confident in performing posterior components separation techniques.

A total of 79 responses to the online survey were received (41.15%). All surgeons attended the course between one to five years. Before attending the workshop 23 surgeons (29%) has perform a TAR but none of them considered themselves an expert in the technique. After attending our course 76 surgeons (96%) changed the way they treat complex abdominal wall problems. After the workshop 68 surgeons (86%) perform a TAR occasionally and 47 surgeons (60%) perform a TAR on regular basis (Figures 1 and 2). In the last year 68 surgeons (88%) perform at least one TAR and 34 surgeons (43%) perform a minimum of five TAR (Figure 3). Regarding the evaluation of the utility of the workshop, more than 88% consider the course very useful and something more than 7% consider interesting but with little influence in their clinical practice; three surgeons at the time of the survey were not dedicating to the complex abdominal wall (Table 3).

Fifty-five surgeons made a more extensive comment. All of them are very stimulating. Some make interesting suggestions, especially on some topic to be discussed in the theoretical part of the course. Most of the comments agree on the adequacy of the course structure and the important of cadaver dissection; they consider that this has allowed them to begin performing the TAR with self-confidence. Some examples of these comments: "I believe the set up of the course was very good", "It was an excellent experience and has completely changed my approach to abdominal wall reconstruction." "Especially the cadaver lab was very useful" "I modified the approach in some cases." "Without this course I would not have started doing TAR" "Excellent course and teaching programme." "The combination of theory with the possibility of seeing live surgery helps to better understand the surgical technique. Cadaver lab was a unique opportunity."

## Discussion

The TAR has been considered a landmark in abdominal wall reconstruction [7]. This new technique has changed the approach of many complex patients and many scientific papers have been published in the last years regarding this posterior components separation technique. This surgical technique allows a medial advancement of lateral borders of the anterior and posterior layers and depict a wide retromuscular space to lay on the mesh as abdominal wall reinforcement. When we began to use the TAR, quickly convinced ourselves that was a very good option in complex abdominal wall surgery. But in that moment this technique was almost completely unknown in our country and Europe. In this way, the need to develop an educative workshop to teach TAR was proposed.

We think that in order to implement this TAR technique a thorough knowledge of specific anatomical areas is required. **But the reality is that most surgeons are not familiar with this anatomy.** It is estimated that for those who perform open Rives-Stoppa repair, the learning curve for TAR should be about 5 cases but for others, after careful review of the procedural steps and instructional videos, the learning curve should be about 10 to 15 cases [8].

There are certainly pitfalls that can drastically affect the success of this surgery; with experience, these can be overcome easily but initially can be a big problem and discourage many surgeons from starting to use the technique. These include division of incorrect layers, inability to close the posterior plane, division of lateral neurovascular bundles or inferior epigastric vessels or damage to the diaphragm, pleura or pericardium.

We try to design a workshop that enables surgeons to perform a TAR with safety and efficacy. We think it is important an adequate theoretical knowledge prior to begin performing a TAR. This was the reason to design didactic lectures with video demonstrations and interactive sessions. The programme of the workshop was thought to deal all the relevant aspects of the complex abdominal wall surgery. Since in this surgery, we work on unusual anatomical areas we have given great importance to reiterate on knowledge of the anatomy of the abdominal wall and to the identification of the different structures.

The live surgery is important because allows see better the real difficulties of the TAR and the tips and tricks to solve them. We use two different theatres for the attendees to observe how different experienced surgeons face the difficulties of the lateral dissection of the abdomen. One of the surgeries begins with a lag of about 45 or 60 minutes. This allows that the TAR dissection to be performed at different time in each theatre and thus the attendees have the opportunity to see two dissections along the same period of time.

The third part of the course, the cadaver dissection, is essential. It allows placing the surgeon in a situation very similar to the real one of a patient. It helps the surgeon to learn to follow the different steps of the dissection, to identify the

critical points of the surgery and to recognize the different anatomical planes. In order to achieve all these details, it is necessary that the handling of tissues and the ease or difficulty in separating one structure from other resemble those of our patients. This is achieved with the use of a fresh frozen cadaver [9]. If the cadaver is defrosted correctly, the skeletal and visceral tissues will retain the colours and texture found in a living body. We believe that in this way we get the ideal way to perform training in abdominal wall surgery.

This paper describes the outcomes of and feedback from the first 192 attendees attending one of the first cadaveric simulation courses in TAR surgery. The trainees had high levels of satisfaction and 96% of surgeons who responded to the online survey have changed the way they treat complex abdominal wall problems. This is very important and indicates that the course is well designed and fulfils the main goal for which it was designed. It is striking that even attendees who do not perform TAR after the workshop have changed the way they treat the complex problems of the abdominal wall. The 86% of those who responded to the online survey had sporadically performed a TAR and 60% of surgeons perform a TAR on regular basis. Taking in account that only 29% of surgeons had performed a TAR before the course, this represent a substantial change and means that the surgical technique has been widely accepted and extended in Europe. The answers of the open question (“We would appreciate any comments or suggestions you would like to make”) are very interesting for us because confirm that the structure of course that we develop is very useful to teaching the TAR and is highly valued by attendees.

Our study has some limitations. It can be argued that the response rate to the survey is low (41.15%), but the number of responding surgeons seems sufficiently representative. The study may be limited by self-report bias. Other potentials bias of the study is that a medical company selected the attendances but the reality is that all the participants were surgeons with experience and interest in abdominal wall surgery. On the contrary, we believe that this course is a sign that collaboration with the pharmaceutical industry can be useful in the education and training of surgeons. **Other limitation of the study is that we have not asked the attendees their effectiveness on TAR before and after the workshop, but these statistics would have been very difficult to obtain. We believe that the fact that 96% of attendances (surgeons with experience in complex abdominal wall) modify their way of treating the complex abdominal wall shows quite well the real value of the workshop.**

Currently, the larger focus for continuing medical education (CME) is the hours needed to maintain licensure and certification. There are many courses, workshops, symposiums on abdominal wall surgery, that allow complete the necessary number of hours to satisfy licensure needs, but we know little of what is its real effectiveness in the training of surgeons. There are some studies that have tried to know the usefulness of a laparoscopic simulator in the training of laparoscopic surgery of the abdominal wall [10,11]. But to our knowledge, this is the first study to evaluate the utility of a workshop of complex abdominal wall surgery. **We believe that, with the limitations mentioned before,** the results

obtained support the usefulness of these courses. We believe that the didactic methodology that we have used has been essential. **In our experience the combination of theoretical knowledge, live surgery and cadaver dissection is very important** for the implementation of new surgical techniques in abdominal wall surgery and we think it is the ideal way for teaching abdominal wall reconstruction techniques.

### Conclusions

**A well-designed workshop may be a useful tool to expand the use of new surgical techniques in abdominal wall surgery.** Every course on surgical technique of the complex abdominal wall must have a practical part in order to achieve its objectives. **A very good way** to perform this practical part is the dissection of a fresh frozen cadaver.

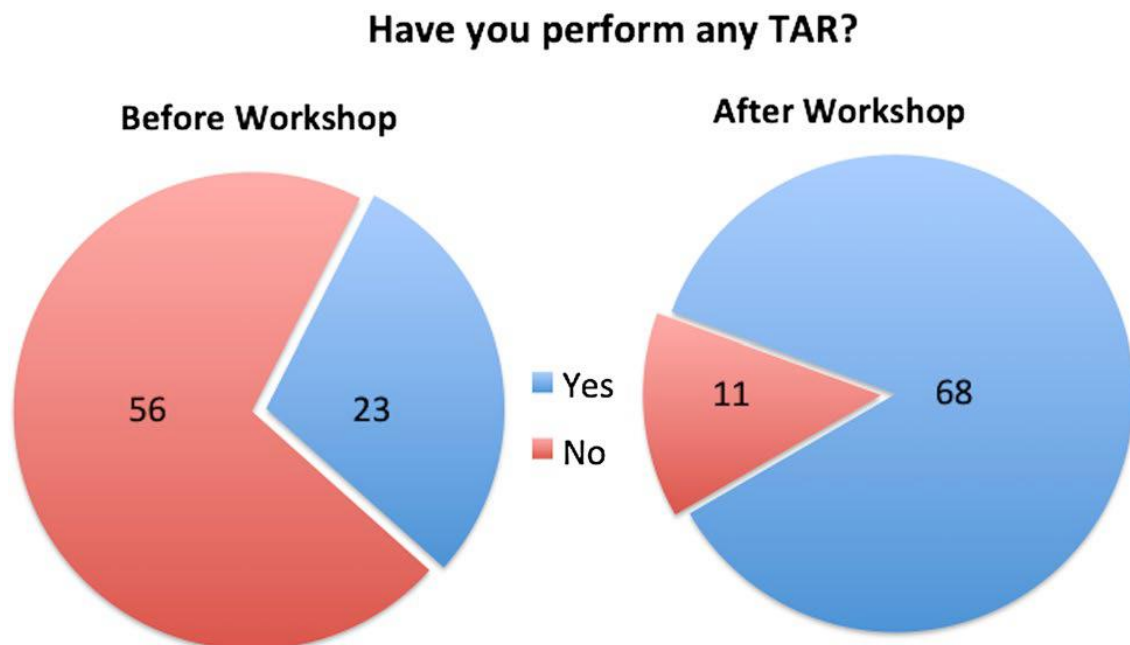
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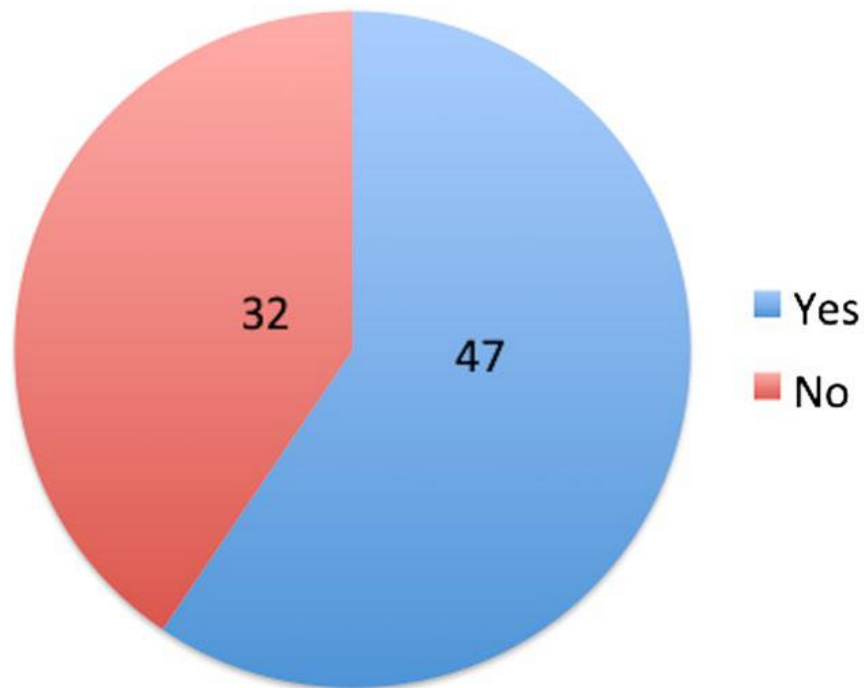
**Figure captions:**

**Fig 1** Number of surgeons who perform TAR before and after attending the workshop. (Answers to the questions 2 and 4)



**Fig 2** Surgeons who perform a TAR on regular basis after the workshop (Answers to the question 5)

### Surgeons who perform a TAR on regular basis



**Fig 3** TAR performed the last year (Answers to the question 6)

