



Learning the Robotic Abdominal Wall Surgery: a single center training program for laparo-endoscopic skilled surgeons

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Abstract

Minimally invasive surgery for abdominal wall has demonstrated many advantages over open procedures with shorter time to return to normal life for patients, less postoperative pain and surgical complications.

Robotic approach to abdominal wall surgery has combined advantages of laparoscopic surgery and the possibility of replicate the same gestuality of open procedures that are challenging in laparoscopy.

We propose a curriculum training for surgeons for complete the learning curve of robotic procedures for abdominal wall defects.

Keywords: Robotic Surgery, Abdominal wall surgery, training program, hernia surgery

1. Introduction

Minimally invasive approach has clear advantages over open surgery in terms of postoperative pain and recovery. {Stabilini, 2013 #18}, (Harris, 2018 #24) (Huisman, 2016 #20).

Robotic surgery, only very recently, has become a trend topic in abdominal wall surgery and has been shown to be at least as effective and safe as laparoscopy in groin and ventral repair but at higher costs in experienced hands. {Merola, 2020 #23}.

Very less is known on the most efficient pathway to achieve proficiency in this type of approach.

Many studies were conducted in gynecological and urology surgery investigated the best training curricula program for teaching to residents and expert laparoscopic surgeons robotic procedures. {Azioni, 2010 #9}

In our center we have developed a training program for general surgeons to master the robotic approach for abdominal wall surgery. {Gurrado, 2016 #5} (Stabilini, 2018 #21).

2. State of the art

3. Materials and Methods



Our training program, dedicated to surgeons already skilled in laparo-endoscopic techniques, includes a preclinical training course performed in our hospital by experts in robotic surgery in which the first lesson is based on learning basics of functioning and steps for docking the DaVinci Robot for basics procedures in abdominal wall surgery.

After a first approach to the console, the training program includes multiple sessions, twice a week of 3 hours each, on virtual reality simulator and dry lab.

Robotics educational video sessions aimed to reach the knowledge of basic skills and gestuality are proposed at the end of the preclinical course. (Cavallaro, 2009 #4)(Milone, 2020 #14)

Robotic TAPP for uncomplicated, bilateral, inguinal hernia is the next step in the pathways. We believe that this type of procedure, due to the required dissection, mesh positioning and suture skills can represent a good field to develop the gesture requested for more complex repairs. (Milone, 2017 #13)

Simple ventral hernia repair is the following step, starting to repair ventral defects with IPOM plus and TARUP technique.

IPOM plus technique for small ventral or incisional hernia (Stabilini, 2019 #22) consists in defect closure with sutures and apply an intraperitoneal mesh with tacks.

The robotic TARUP technique, as described by Muysoms, is an evolution of the tapp technique used for ventral hernia retromuscular repair with a single docking of the DaVinci robot. (Muysoms, 2018 #25)

Adhesiolysis, midline reconstruction with sutures and developing the retromuscular space can prepare the surgeon for more complex cases.

At the top of the complexity there are incisional hernia repair performed by robotic posterior Component Separation, parastomal hernia repair and complex inguinal hernia cases.

4. Discussion

The biggest possible advantage of robot in this field is represented by the possibility of truly replicate the technique of abdominal wall reconstruction that can be suboptimal and difficult in standard laparoscopic techniques. {Cavallaro, 2009 #4}.

The learning curve of abdominal wall surgery is shorter if the surgeon is already expert before approaching the robot.

Starting with r-TAPP can help both the surgeon and the team (anesthesiologists and nurses) to gain confidence with these patients and robotic approach.

The TARUP technique is useful for beginning the approach to the retrouscolar space, that is proven to be the right plane where placing the mesh, without an extensive dissection as requested in more complex technique for ventral hernia repair.

Complete the learning curve for abdominal wall surgery techniques allows to the surgeon to be confident with dissection of planes, suturing, adhesiolysis that are very important skills for approach of other procedures for upper or lower GI. (Fornaro, 2009 #17) (Papadia, 2003 #16), (Bracale, 2012 #8) (Cavallaro, 2010 #3) (Frascio, 2014 #15) (Bracale, 2017 #11;Cavallaro, 2015 #6;De Toma, 2000 #7;Fornaro, 2008 #19;Porcellini, 2002 #12)

5. Conclusions

Robotic approach has a clear advantage over open approach for abdominal wall surgery.

High costs and longer operative times are two potential disadvantages of this technique but improving the learning curve could reduce operative time and postoperative complications, decreasing direct and indirect costs.

Further studies should be conducted in this perspective analysing with a long follow up the application on a large cohort this protocol.

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