LETTER TO THE EDITOR

How to train your surgeon! Experience of a patient side assistant

Introduction

The robotic surgery programme at the Bristol Urological Institute started in 2009. The bedside assistants for the initial patients changed frequently as the role was given to the uro-oncology trainee working with the team at that time. However, established robotic surgery programmes use permanent bedside assistants. This continuity across all cases translates into a more efficient workflow, and in our opinion is essential to any robotic surgery service. Our current senior bedside assistant recognised this need and successfully secured funding for such a post in Bristol in 2010. We currently have two permanent bedside assistants who had training as surgical care practitioners (SCPs). As part of their training they complete a 2-year MSc in surgical care practice at Cardiff University. Our SCPs have assisted in >1300 robotic procedures, including prostatectomy, cystectomy, partial nephrectomy and pyeloplasty. They continue to be vital to the programme and have been involved in training of more than a dozen successive surgeons. In this article we present the personal experience of our senior SCP, which will demonstrate the benefits that highly qualified bedside assistants have on the training of robotic-assisted surgeons.

Not all surgeons are the same

There are different types of trainees robotic-assisted surgeons; the experienced open surgeon who is trying to translate his or her skills into the robotic world, and the experienced laparoscopic surgeon, who has learned to rely on vision rather than sensation. The open surgeon will miss the tactile component of operating and needs to learn to rely solely on optical clues. The job of the bedside assistant is to make the surgeon aware of those and to indicate them. This type of surgeon will also need special instruction and guidance on how to use the fourth arm of the robot and how to bring the instruments of the assistant effectively into play. The laparoscopist is aware of methods to optimise tissue tension to aid dissection. However, their main challenge is the transition from working with rigid, non-articulating instruments to the full articulation provided by robotic surgery system (Da Vinci, Intuitive Surgical, Sunnyvale, CA, USA). Now that robotic urological surgery has become established, many junior surgeons train in our department. They are usually quick to grasp the essentials of the Da Vinci system, but need guidance on the anatomy and surgical steps of the procedures.

Training the novice surgeon

The essential first step for the novice is to attend a training course to become familiar with the basics of the da Vinci surgical system. These courses are provided not only through the company (Intuitive Surgical) but also at established robotic centres, such as the Chitra Seta Centre in London, UK. Unsurprisingly, most trainee robotic surgeons want to proceed directly onto the console, but the focus of the ‘dry-laboratory’ courses is very much on the system set-up. Although the trainee might not appreciate the importance, the ability to trouble-shoot problems with the set-up is essential to any future robotic surgeon, enabling them to focus on the actual operative steps.

After completing the course, we suggest that the trainee observe several procedures, study entire case videotapes, and use the simulation module on the Si Da Vinci system before moving on with their training.

The next step is often overlooked by the trainee, and it is to take over the role of the bedside assistant. Robotic procedures rely on traction and counter-traction, and a clear operating field, and therefore knowledge of how to effectively use the Johan Grasper and how to aspirate at the right time is essential. This must be achieved without hindering the surgeon’s progress. Furthermore, only as a trained bedside assistant will the future robotic surgeon be able to work synergistically with their assistant to complete the operation. It is often quite obvious when a surgeon has bypassed this step. Not only do they hinder their assistant in terms of blocking access to the surgical field, they ask for manoeuvres which are technically impossible and are also unable to trouble-shoot technical problems which...
can occur with the system during surgery. This lack of knowledge translates into longer procedures. The trainee should practice assisting until proficient; this is usually achieved after ≈20 cases and should be supervised by an experienced assistant. Only after completing this step is the surgeon ready to take the next step and to move to the console. The remainder of this article outlines the contribution of the bedside assistant to selected steps of a robotic-assisted laparoscopic prostatectomy (RALP), and what the surgeon can learn when assisting at the bedside.

Surgical steps

To achieve structured and reproducible training the RALP has been divided into 10 different steps, which should be followed meticulously. The first step is to position the patient and to dock the robot. If this is done incorrectly the entire procedure becomes incredibly difficult, e.g., due to instrument clashes. In a team with changing members, it is essential that the bedside assistant or lead surgeon supervises this process.

One approach for RALP is to start by dissecting the seminal vesicles and vasa posteriorly. This approach relies on a careful and appropriate upward traction of the bladder and precise application of haemostatic clips to vessels lateral to the vesicles. The subsequent incision of Denovilliers’ fascia requires the assistant to gently apply downward traction to the fascia. Further traction enables the console surgeon to safely dissect up to the apex of the gland without damaging the rectum.

The bladder can be dropped from the anterior abdominal wall, but this relies on appropriate medial traction on the medial umbilical ligaments by the assistant. Exposure of the prostate after the bladder separation is aided by elevation of the pre-prostatic fat by the assistant, allowing the surgeon to use both instruments to remove the fat, including any potential lymph nodes. Incision of the endopelvic fascia and exposure of the apex is made significantly easier through traction applied to the edge of the incised endopelvic fascia medially. The dorsal venous ligating suture can be made accurately through medial pressure applied to the ‘shoulders’ of the gland with the sucker. This manoeuvre not only secures the gland but also allows the precise insertion of the ligation without ligating the urethra.

The anterior bladder neck is then defined by pulling on the catheter, which shows the line of incision caudal to the balloon. Using the fourth arm to pull the bladder cranially and apply more traction on the bladder with the Maryland forceps present the anatomical line of dissection. The most challenging part of the procedure is the posterior bladder neck dissection. However, careful suction and traction on the bladder keep the operative field clear and facilitate efficient dissection.

Releasing the neurovascular bundles requires a combination of blunt and sharp dissection without the use of cautery. The nerves can be released from the prostate in a retrograde or antegrade fashion, but either technique relies on a clear operative field and appropriate traction by the assistant on various parts of the prostate gland. Traction by the assistant is also essential during control of the pedicles, particularly on the left side. An experienced bedside assistant is able to quickly alternate between retracting seminal vesicles or prostate, and applying clips. Furthermore, if the console surgeon uses the experience obtained during bedside assisting, they will not only prepare appropriately sized tissue for clipping but also position their instruments to improve exposure rather than blocking access to the assistant.

During the apical dissection it is again essential to use the fourth arm and the Maryland forceps, similar to the technique described for the anterior bladder neck. Appropriate suction and retraction of the underlying rectum allow careful and safe apical and urethral division.

Conclusion

There are different types of trainees and all of them need to be treated according to their specific background and skill set. A structured training programme consisting of an introductory course, ‘dry laboratory’ work and bedside assistance is crucial before making the first steps on the console. The above section illustrates the essential role played by the bedside assistant during the training of novice surgeons. We find that experienced bedside assistants can dramatically decrease the operative and training times. Furthermore, they can reduce blood loss and it is not an overstatement to say that they can reduce complications and sometimes prevent the need for conversion.

Our SCPs can appreciate the wider view during complex procedures. Both experienced and trainee surgeons can become totally absorbed in the three-dimensional world of the console, and the ability of SCPs to identify these situations and manage the team, e.g., by suggesting something as simple as a short break, improves the experience of the entire team. Therefore, a skilled and experienced bedside assistant is not only the key to a successful procedure, but also an important factor in training the robotic surgeon. Their experience and knowledge can significantly influence the time required to fully train a surgeon.

Learning points

- RALP is a highly complex procedure and its success depends on a well trained team;
- Not every surgeon has the same background, and training needs to be specifically tailored;
- The steps of the procedure need to be followed meticulously;
- Every step has a crucial point which needs to be acknowledged and facilitated by the bedside assistant;
- The surgeon can be so focused on his narrow operating field that he easily forgets the overall view; a team approach helps to prevent mistakes.

Clive Sheridan
Christian Bach
Anthony Koupparis *

The Bristol Urological Institute, Bristol, UK
E-mail address: anthony.koupparis@nbt.nhs.uk
(A. Koupparis)