Robotic colorectal resections at UMC Ljubljana - steady road from competency to proficiency

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Advances in surgery have allowed the widespread use of minimally invasive approaches, becoming the standard of care for more and more diseases. Robotic resections represent a novel but increasingly popular approach to treatment of colorectal cancer. Robotic surgical systems help surgeons to overcome limitations of laparoscopic surgery, offering better visualisation with three-dimensional magnified view and stable camera plaform, stabilization of tremors and greater dexterity of movements. Moreover, they also improve the ergonomics for the operating surgeon (1).

The evolution and usage of robotic platform is well ilustrated by bibiometric data, as more and more manuscripts are being published each year, from feasibility studies to case series and reviews, and, finally, more and more multi-centre trials. The abundance of published research clearly shows, how robotic assisted surgery has gained acceptance not only in the field of colorectal surgery but across many surgical specialties (2).

Da Vinci Xi robotic platform was introduced at University Medical Centre Ljubljana in 2018, when urologists started with robotic operations. We followed in 2020, and since then more than 1000 robotic operations (700 urological and 400 abdominal) were done.

With the introduction and implementation of a new surgical approach, surgeons need to climb a learning curve, representing the amount of procedures, required to achieve an adequate surgical preformance, regarding safety, efficacy and also efficency (3). The ideal minimal invasive procedure has a short learning curve and is therefore easy to master. Moreover, the period in which the surgeon »climbs« the learning curve, should not result in additional morbidity, worsened oncological outcomes or even mortality for the patient.

Our path is generally summarized in figure 1 and it started with gaining knowledge of robotic surgery principles, including robotic system components, console operation, robotic instrument handling and trocar placement. This was achieved through on-site (our operating theatre) »dry-lab« training, well organized by the Intuitive representatives, followed by cadaveric training in Naples, Italy. These training programs were focused on general robotic principles and also specifically on colorectal procedures. Participation enabled learning with the help of didactic sessions, virtual simulations and with allready mentioned hands-on

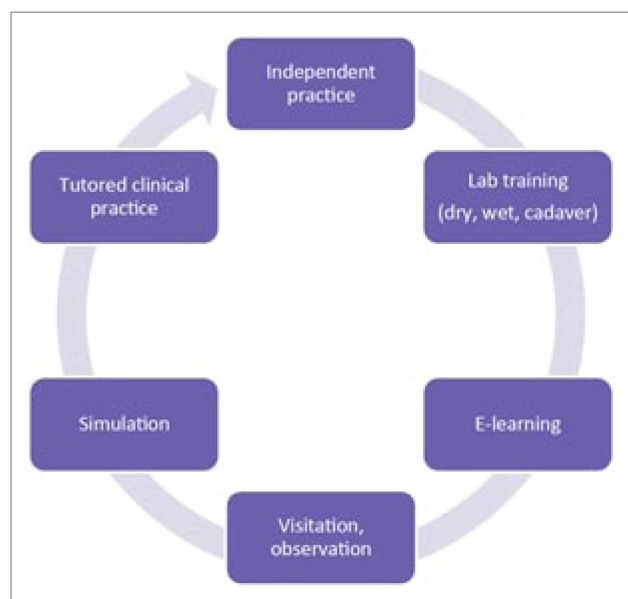

Figure 1. Robotic training pathway

training using surgical robotic systems. To further strengthen our robotic programe and accelerate our learning curve climb, we established a collaboration with an experienced robotic surgeon, prof. Morpurgo from Camposampiero, Italy. Our partnership started with visitation to Camposampiero and observing typical robotic colorectal resections performed by prof. Morpurgo and his team. Thereafter, when starting with our own initial cases, our collaboration continued by inviting prof. Morpurgo to UMC Ljubljana for proctorship and guidance.

Transitioning from mere competency to proficiency in performing robotic colorectal resections requires a systematic and stepwise approach and this is exactly how we chose to implement this new technology at University Medical Centre Ljubljana.

By selecting less complex cases at first, such as sigmoidectomies or right colectomies for benign disease or locally non-advanced tumors, we assured the safety of our patients and quality of surgery, hence the treatment results were not compromised.

Even when starting more challenging cases, only patients with colon and later on upper rectal cancer were operated at first, because we deemed middle and low rectal cancers not suitable due to technical demands of pelvic surgery. Only later on did we start, succesfully, performing even the most technically demanding robotic colorectal resections (4, 5).

From the very beginning, we established a database (a simple registry), which is prospectively populated with all the relevant clinical data (patient demographics, operative characteristics, postoperative follow-up,...). Only through analyzing this data we can appreciate, how good or bad our results are, in terms of of postoperative morbiditiy, mortality and long term survival in case of cancer patients. To have a succesfull and long-lasting surgical program, it is crucial to analyze outcomes and complications to identify areas of improvement and facilitate the adoption of best practices.

It has to be appreciated, that before embarking on a road of robotic colorectal resections our surgical department had an established competency in colorectal surgery in terms of tradional open or laparoscopic approaches. This probably played a role in faster acquisition of skills on the robotic platform. However, this journey from competency to proficiency is not something to achieve and than just stop when one feels skilled or proficient enough. The surgeon and all the team must stay dedicated and work together to persevere through difficulties they will encounter and continously seek to refine their skills and experiences. It is important to stay updated with the latest literaure, attend conferences and engage with professional societes.

This is how the continuity of the robotic program can be accomplished, allowing for a proper surgical volume for every robotic surgeon, which is crucial for mantaining and enhancing proficiency and continous improvement.

References

1. Wee IJY, Kuo LJ, NGU JCU. A systematic review of the true benefits of robotic surgery: ergonomics. Int J Med Robotics Comput Assist Surg 2020; 16(4): e2113. doi: 10.1002/rcs.211
2. Connelly TM, Malik Z, Sehgal R, Byrnes G, Coffey JC, Peirce C. The 100 most influential manuscripts in robotic surgery: a bibliometric analysis. J Robot Surg 2020; 14(1): 155-65. doi: 10.1007/s11701-019-00956-9
3. Khan N, Abboudi H, Khan MS, Dasgupta P, Ahmed K. Measuring the surgical learning curve: methods, variables and competency. BJI Int 2014; 113:504-8.)
4. Grosek J, Tomažič A, Košir JA, Hawlina S. Simultaneous robot-assisted abdominoperineal rectal resection and Retzius-sparing prostatectomy for synchronous rectal and prostate cancer- a video vignette. Colorectal Dis 2022;24(12): 1626-7
5. Grosek J, Tomažič A, Frelih M, Hawlina S. Simultaneous robotic resection of pheochromocytoma and gastrointestinal stromal tumor in an adult neurofibromatosis type 1 patient: A single docking procedure using da Vinci XI platform. J Minim Access Surg 2022; 18(2): 311-3.