EUROPEAN UROLOGY OPEN SCIENCE 46 (2022) 147–148

available at www.sciencedirect.com
journal homepage: www.eu-openscience.europeanurology.com

European Association of Urology

Letter to the Editor

Re: Walter Artibani, Giovanni Cacciamani. Is the Choice Between Clips and No Clips or Cautery and No Cautery Still a Dilemma in Robot-assisted Radical Prostatectomy? Eur Urol Open Sci 2022;44:76–7

We read with interest the debate regarding the choice between clips and a thermal approach for the neurovascular bundles (NVBs) during robot-assisted radical prostatectomy (RARP) [1]. We agree with the authors that beyond the clipping or clipless technique, many other variables can affect functional outcomes after RARP. In this phase, the predominant focus of the surgeon should be on accurate dissection, accepting some bleeding while operating, rather than total hemostatic control with the aim of working under clear vision. Indeed, it is well demonstrated that accurate NVB dissection is of primary importance to allow good recovery of potency and continence after surgery [2]. NVB dissection is a highly complex step in the procedure, with the greatest performance differences between novices and experts and the highest number of errors observed in comparison to other phases of the surgery [3]. Regardless of the decision on whether to clip or not to clip, careful dissection of the periprostatic tissues is of primary importance, applying gentle traction to the prostate and not on the bundles and avoiding overstretching of the nerves that can lead to neuropraxia, with detrimental effects on functional recovery.

The development of technical innovations for robotic platforms may lead to optimization of RARP surgical techniques, with the promise of a high-precision surgical era [4,5]. The industry is working to enhance the surgical efficacy of a new generation of robotic instruments by reducing heat dispersion and improving their safety profile. For example, advanced bipolar forceps have been investigated in ex vivo and in vivo porcine models [6]. In comparison to laparoscopic instruments, these novel forceps showed greater slip resistance force, a lower temperature, and limited thermal spread (of ~1 mm), suggesting minimal thermal injury to nerves. Taken together, these features represent an appealing alternative to the current robotic armamentarium. Yet, as wisely mentioned in the debate [1], animal studies may outline the basis for application of these new tools in real-world scenarios, but we must also acknowledge that is not always possible to transfer preclinical data to real clinical experience.

Artificial intelligence (AI) and the implementation of technological innovations can have a huge impact on tailoring the NVB surgical approach. The use of three-dimensional models, augmented reality, and real-time digital microscopy can expand indications for nerve-sparing surgery, reducing the risk of positive surgical margins [7,8]. Tissue segmentation and instrument detection could help in identifying and preserving critical structures such as nerves and undetected functional tissue, and could potentially aid in avoiding adverse events and/or wrong dissection planes, taking surgical precision to the highest level [9].

Robotics also provides the ideal environment for training programs and innovative teaching methods. There is evidence that the robotic approach—with its established technical and educational advantages—might boost the learning curve of new adopters [10]. A systematic approach to the teaching of proper dissection is possible with new training pathways that include standardized and reproducible video assessments. Notably, surgeons trained using a scientific, validated, and metrics-based approach such as proficiency-based progression training can reduce objectively assessed errors by 60% in comparison to traditional training programs [11]. In addition, automated assessment of performance metrics, along with implementation of telementoring programs, may increase access to efficient training and credentialing of qualified surgeons, ensuring high-quality surgical education on a large scale [12].

For all these reasons, we strongly believe that quality-assured training, together with technical innovations and AI applications, can lead to greater surgical accuracy and consequently better surgical outcomes.

In conclusion, novel tools, instruments, and technological improvements will increase surgical precision, allowing RARP to be tailored and the NVB surgical technique to be adapted for each individual case. This will primarily be made possible by the features of robotic surgery, which places a machine between the surgeon and the patient, and its many possible implementations. In this context, the dilemma of NVB dissection seems to be related more to surgical accuracy than to the technique itself, and perhaps new instruments will render the debate over whether to clip or not to clip obsolete. It is plausible that the robotic approach per se might allow extremely accurate NVB dissection and

DOI of original article: https://doi.org/10.1016/j.euros.2022.08.010

https://doi.org/10.1016/j.euros.2022.10.015

selective bleeding control and thus might ensure optimal results with or without the use of clips and/or coagulation.

Conflicts of interest: Alexandre Mottrie is a proctor for Intuitive and an advisor for Medtronic. The remaining authors have nothing to disclose.

References

[1] Artibani W, Cacciamani G. Is the choice between clips and no clips or cautery and no cautery still a dilemma in robot-assisted radical prostatectomy? Eur Urol Open Sci 2022;44:76–7. https://doi.org/10.1016/j.euros.2022.08.010.

[2] Walz J, Epstein JI, Ganzer R, et al. A critical analysis of the current knowledge of surgical anatomy of the prostate related to optimisation of cancer control and preservation of continence and erection in candidates for radical prostatectomy: an update. Eur Urol 2016;70:301–11. https://doi.org/10.1016/j.eururo.2016.01.026.

[3] Mottrie A, Mazzone E, Wiklund P, et al. Objective assessment of intraoperative skills for robot-assisted radical prostatectomy (RARP): results from the ERUS Scientific and Educational Working Groups Metrics Initiative. BJU Int 2021;128:103–11. https://doi.org/10.1111/bju.15311.

[4] Checcucci E, Amparore D, De Luca S, Autorino R, Fiori C, Porpiglia F. Precision prostate cancer surgery: an overview of new technologies and techniques. Minerva Urol Nefrol 2019;71:487–501. https://doi.org/10.23736/S0393-2249.19.03365-4.

[5] Bravi CA, Paciotti M, Sarchi L, et al. Robot-assisted radical prostatectomy with the novel Hugo robotic system: initial experience and optimal surgical set-up at a tertiary referral robotic center. Eur Urol 2022;82:233–7. https://doi.org/10.1016/j.eururo.2022.04.029.

[6] Ibanez Jimenez C, Lath A, Ringold F. Novel multifunctional robotically assisted bipolar instrument for simultaneous radiofrequency sealing and transection: preclinical and single-center experience. BMC Surg 2022;22:37. https://doi.org/10.1186/s12893-022-01483-5.

[7] Checcucci E, Pecoraro A, Amparore D, et al. The impact of 3D models on positive surgical margins after robot-assisted radical prostatectomy. World J Urol 2022;40:2221–9. https://doi.org/10.1007/s00345-022-04038-8.

[8] Rocco B, Sarchi L, Assumma S, et al. Digital frozen sections with fluorescence confocal microscopy during robot-assisted radical prostatectomy: surgical technique. Eur Urol 2021;80:724–9. https://doi.org/10.1016/j.eururo.2021.03.021.

[9] De Backer P, Eckhoff JA, Simoens J, et al. Multicentric exploration of tool annotation in robotic surgery: lessons learned when starting a surgical artificial intelligence project. Surg Endosc. In press. https://doi.org/10.1007/s00464-022-09487-1.

[10] Bravi CA, Dell'Oglio P, Mazzone E, et al. The surgical learning curve for biochemical recurrence after robot-assisted radical prostatectomy. Eur Urol Oncol. In press. https://doi.org/10.1016/j.euo.2022.06.010.

[11] Gallagher AG, De Groote R, Paciotti M, Mottrie A. Proficiency-based progression training: a scientific approach to learning surgical skills. Eur Urol 2022;81:394–5. https://doi.org/10.1016/j.eururo.2022.01.004.

[12] Chen J, Cheng N, Cacciamani G, et al. Objective assessment of robotic surgical technical skill: a systematic review. J Urol 2019;201:461–9. https://doi.org/10.1016/j.juro.2018.06.078.

Luca Sarchi
Ruben De Groote
Alexandre Mottrie *

ORSI Academy, Ghent, Belgium
Department of Urology, Onze-Lieve-Vrouwziekenhuis Hospital, Aalst, Belgium

*Corresponding author. ORSI Academy, Proefhoevestraat 12, 9090 Ghent, Belgium.
E-mail address: a.mottrie@gmail.com (A. Mottrie).

October 5, 2022