



Comparing the Technological and Intraoperative Performances of Da Vinci xi and Da Vinci 5 Robotic Platforms in Patients Undergoing Robotic-Assisted Radical Prostatectomy

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ABSTRACT

Introduction: In the last two decades, several Da Vinci robotic platforms have been released in the market, revolutionizing the field of robotic-assisted surgery (1, 2). The system has seen numerous modifications, with several Da Vinci® robotic models being introduced, each featuring ongoing technological advancements in ergonomics, instrumentation, high-definition imaging, EndoWrist™ technology, and single-port surgery capabilities (3, 4). Building on this, the new generation Da Vinci 5 robot promises significant hardware and software improvements, with the potential for enhanced operative performance (2, 5). In this video, we will illustrate several technical advancements of the Da Vinci 5.

Material and methods: We performed a video compilation comparing the Da Vinci 5 and Da Vinci Xi during radical prostatectomy. The video will highlight the technical modifications of the new platform, showcasing the advancements and improvements in the Da Vinci 5 system. Additionally, this video will illustrate key aspects of the surgery, including anterior bladder neck access, lateral bladder dissection from the prostate, posterior prostate dissection and anastomosis.

Surgical technique: We performed our RARP technique with our standard approach in all patients (6-8). With this new platform, we maintained our conventional technique without any modifications or adaptations from the trocar placement until anastomosis. The beginning of the case is performed as usual, we first identify the anterior bladder neck and then complete its dissection with Maryland and Scissors. Then, we proceed to the posterior bladder neck dissection, seminal vesicles control and nerve-sparing. In sequence, we control the prostate arterial pedicles with hem-o-lok clips and then we perform the apical dissection until dividing the urethra. Finally, we perform the hemostasis, posterior reconstruction (Rocco's technique) and anastomosis with barbed suture.

Results: The Da Vinci 5 features several key upgrades. The first part of our video described the console, patient cart, and energy tower modifications. The console has been ergonomically redesigned for a flat neck posture to decrease muscle fatigue, and the handgrip now includes a rubber surface for better grip (9). The patient cart, similar to the previous generation, has updated helm interfaces and integrated commands with the console and vision tower. In sequence, we described the instrument modifications and the step-by-step technique showing the DV5 and DV-Xi. Force feedback instruments provide three degrees of tactile feedback, enhancing tissue manipulation. A new security system ensures instruments can only be inserted when clear of tissues and obstructions, reducing the risk of errors. Another modification regards the ability to switch instruments and camera.

Conclusion: While using and evaluating the DV5 in more than 100 cases, we noticed some improvements in the ergonomics and digital interface. The intraoperative performance was similar among the platforms and all procedures were performed without intraoperative complications or problems with the system. However, we are still evaluating the long-term outcomes and potential clinical advantages provided by this new platform.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Gamal A, Moschovas MC, Jaber AR, Saikali S, Perera R, Headley C, et al. Clinical applications of robotic surgery platforms: a comprehensive review. *J Robot Surg.* 2024;18:29. doi: 10.1007/s11701-023-01815-4.
2. [No Authors]. Intuitive | Maker of Da Vinci & Ion Robotic Systems. n.d. Available at: <<https://www.intuitive.com/en-us>> [Last accessed: 9/29/2024].
3. Rassweiler JJ, Autorino R, Klein J, Mottrie A, Goezen AS, Stolzenburg JU, et al. Future of robotic surgery in urology. *BJU Int.* 2017;120:822-41. doi: 10.1111/bju.13851.
4. Shin HR, Lee K, Yu HW, Kim SJ, Chai YJ, Choi JY, et al. Comparison of Perioperative Outcomes Using the da Vinci S, Si, X, and Xi Robotic Platforms for BABA Robotic Thyroidectomy. *Medicina (Kaunas).* 2021;57:1130. doi: 10.3390/medicina57101130.
5. Covas Moschovas M, Saikali S, Gamal A, Reddy S, Rogers T, Chiara Sighinolfi M, et al. First Impressions of the New da Vinci 5 Robotic Platform and Experience in Performing Robot-assisted Radical Prostatectomy. *Eur Urol Open Sci.* 2024;69:1-4. doi: 10.1016/j.euro.2024.08.014.
6. Moschovas MC, Patel V. Nerve-sparing robotic-assisted radical prostatectomy: how I do it after 15.000 cases. *Int Braz J Urol.* 2022;48:369-70. doi: 10.1590/S1677-5538.IBJU.2022.99.03.
7. Moschovas MC, Patel V. Neurovascular bundle preservation in robotic-assisted radical prostatectomy: How I do it after 15.000 cases. *Int Braz J Urol.* 2022;48:212-9. doi: 10.1590/S1677-5538.IBJU.2022.99.04.
8. Covas Moschovas M, Bhat S, Onol FF, Rogers T, Roof S, Mazzone E, et al. Modified Apical Dissection and Lateral Prostatic Fascia Preservation Improves Early Postoperative Functional Recovery in Robotic-assisted Laparoscopic Radical Prostatectomy: Results from a Propensity Score-matched Analysis. *Eur Urol.* 2020;78:875-84. doi: 10.1016/j.eururo.2020.05.041.
9. Patel E, Saikali S, Mascarenhas A, Moschovas MC, Patel V. Muscle fatigue and physical discomfort reported by surgeons performing robotic-assisted surgery: a multinational survey. *J Robot Surg.* 2023;17:2009-18. doi: 10.1007/s11701-023-01608-9.

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