

Yavuz Tarık ATİK¹
Hacı İbrahim ÇİMEN²

GİRİŞ

Binder ve Vallencien'in 2000' li yılların başlarında prostat kanseri olan hastalarda ilk kez Da Vinci robotik cerrahi sistemlerini kullanmalarının ardından robotik cerrahi üroloji alanında günden güne artan oranlarda kullanım yeri bulmuştur (1). Sonraki dönemlerde minimal invaziv cerrahinin daha da ön plana çıkmasıyla, robotik cerrahi sağladığı birçok avantajla maliyet dezavantajına rağmen daha sık uygulanır hale gelmiştir.

ROBOTİK RADİKAL PROSTATEKTOMİ

Klinik olarak lokalize prostat kanseri tedavisinde açık, laparoskopik ve robotik radikal prostatektomi ameliyatları uygulanmaktadır. Altın standart olan açık radikal prostatektomiye alternatif olarak laparoskopik ve robotik tekniklere yönelik ürologlar arasında hızla artmaktadır. Robotik cerrahide; 3 boyutlu görüntü olması, el hareketlerini taklit edebilmesi, peroperatif kanamanın daha az olması, hastanın günlük yaşamına daha hızlı dönmesi ve operasyon sonrası ağrının daha az olması gibi avantajların bulunması cerrahların tercihinde önemli rol oynamaktadır (2). Böylelikle laparoskopinin iki boyutlu görüntü ve hareket kısıtlılığı gibi sınırlılıkları da giderilmiş olmaktadır.

Hasta hazırlığında; hastanın komorbiditesi, daha önce geçirmiş olduğu ameliyatlar sorgulanmalıdır. Hastanın pnömoperitonum ve Trendelenburg pozisyonuna uygun olup olmadığı değerlendirilmeli, gerekli branş konsültasyonları tamamlanmalıdır. Hastaya bu operasyonun robot tarafından yapılmayacağı, robottu kumanda edenin cerrah olduğu, kullanılan yöntemden ziyade operasyonu uygulayanın tecrübesinin daha önemli olduğu anlatılmalı, hastaların robotik cerrahi sonrası gereksiz beklenkiye girmemesi sağlanmalıdır.

Hastanın Ameliyat Pozisyonu

Başarılı bir cerrahi için en önemli unsurlardan birisi de hastanın doğru pozisyonda olmasıdır. Hasta en az 30 derece Trendelenburg pozisyonuna alınmalı, solunumu etkilemeyecek şekilde göğüs bölgesinde uzun sargı bezleriyle sarılarak masaya sabitlenmeli ve kayması engellenmelidir (Şekil 1). Hastanın bacakları S ve Si modellerinde hafif litotomi pozisyonunda olmalı iken Xi modelinde prone pozisyonda da olabilmektedir ve bası lezyonlarını önlemek için uyluk ve bacak bölgesi silikon yastıklar ile

¹ Yavuz Tarık Atik, Sakarya Üniversitesi Tıp Fakültesi, yavuztarikatik@gmail.com

² Haci İbrahim Çimen, Sakarya Üniversitesi Tıp Fakültesi, dr.ibrahimcimen@gmail.com

KAYNAKÇA

1. Cimen HI, Atik YT, Altinova S, et al. Does the experience of the bedside assistant effect the results of robotic surgeons in the learning curve of robot assisted radical prostatectomy? International braz j urol: official journal of the Brazilian Society of Urology 2018;45(1):54-60.
2. Rassweiler J, Hruza M, Teber D, et al. Laparoscopic and robotic assisted radical prostatectomy-critical analysis of the results. Eur Urol 2006;49:612-624.
3. Schwen. & Han, M. (2019). Robot-assisted Laparoscopic Radical Prostatectomy. Arthur D. Smith, Glenn M. Preminger, Louis R. Kavoussi, and Gopal H. Badlani (Eds). Smith's Textbook of Endourology içinde, (4th ed., pp. 1169-1178). Chichester: John Wiley & Sons Ltd.
4. Menon M, Hemal AK. Vattikuti Institute prostatectomy: A technique of robotic radical prostatectomy: Experience in more than 1000 cases (discussion 619). J Endourol. 2004;18:611-619.
5. Ahlering TE, Skarecky D, Lee D, et al. Successful transfer of open surgical skills to a laparoscopic environment using a robotic interface: Initial experience with laparoscopic radical prostatectomy. J Urol. 2003;170:1738-1741.
6. Patel VR, Tully AS, Holmes R, et al. Robotic radical prostatectomy in the community setting: The learning curve and beyond: Initial 200 cases. J Urol. 2005;174:269-272.
7. Du Y, Long Q, Guan B, et al. Robot-Assisted Radical Prostatectomy Is More Beneficial for Prostate Cancer Patients: A System Review and Meta-Analysis. Med Sci Monit. 2018;24:272-287.
8. Novara G, Ficarra V, Mocellin S, et al. Systematic review and metaanalysis of studies reporting oncologic outcome after robot-assisted radical prostatectomy. Eur Urol. 2012;62:382-404.
9. Barocas DA, Salem S, Kordan Y, et al. Robotic assisted laparoscopic prostatectomy versus radical retropubic prostatectomy for clinically localized prostate cancer: comparison of short-term biochemical recurrence-free survival. J Urol. 2010;183:990-996.
10. Drouin SJ, Vaessen C, Hupertan V, et al. Comparison of mid-term carcinologic control obtained after open, laparoscopic, and robotassisted radical prostatectomy for localized prostate cancer. World J Urol. 2009;27:599-605.
11. Badani KK, Kaul S, Menon M. Evolution of robotic radical prostatectomy: assessment after 2766 procedures. Cancer. 2007;110:1951-1958.
12. Patel VR, Sivaraman A, Coelho RF, et al. Pentafecta: a new concept for reporting outcomes of robot-assisted laparoscopic radical prostatectomy. Eur Urol. 2011;59:702-707.
13. Di Pierro GB, Baumeister P, Stucki P, et al. A prospective trial comparing consecutive series of open retropubic and robot-assisted laparoscopic radical prostatectomy in a centre with a limited caseload. Eur Urol. 2011;59(1):1-6.
14. Krambeck AE, DiMarco DS, Rangel LJ, et al. Radical prostatectomy for prostatic adenocarcinoma: a matched comparison of open retropubic and robotassisted techniques. BJU Int 2009;103(4):448-453.
15. Ludovico GM, Dachille G, Pagliarulo G. Bilateral nerve sparing robotic-assisted radical prostatectomy is associated with faster continence recovery but not with erectile function recovery compared with retropubic open prostatectomy: The need for accurate selection of patients. Oncol Rep. 2013;29:2445-2450.
16. Tewari A, Srivasatava A, Menon M et al. A prospective comparison of radical retropubic and robot-assisted prostatectomy: experience in one institution. BJU Int. 2003;92(3):205-210.
17. Willis DL, Gonzalgo ML, Brotzman M, et al. Comparison of outcomes between pure laparoscopic vs robot-assisted laparoscopic radical prostatectomy: a study of comparative effectiveness based upon validated quality of life outcomes. BJU Int. 2012;109(6):898-905.
18. Tasci AI, Simsek A, Torer BD, et al. Fascia-sparing intrafascial nerve-sparing robot-assisted radical prostatectomy and anatomic vesicourethral anastomosis: point of technique. Arch Esp Urol. 2014;67(9):731-739.
19. Siegel RL, Miller KD, and Jemal A. Cancer statistics, 2016. CA Cancer J Clin. 2016;66(1):7-30.
20. Donat SM, Diaz M, Bishoff JT, et al. Follow-up for clinically localized renal neoplasms: AUA Guideline. J Urol. 2013;190:407-416.
21. Ljungberg B, Bensalah K, Canfield S, et al. EAU guidelines on renal cell carcinoma: 2014 update. Eur Urol. 2015 May;67(5):913-924.
22. Thompson RH, Lane BR, Lohse CM, et al. Every minute counts when the renal hilum is clamped during partial nephrectomy. Eur Urol. 2010;58:340-345.
23. Klingler DW, Hemstreet GP, Balaji KC. Feasibility of robotic radical nephrectomy--initial results of single-institution pilot study. Urology. 2005;65(6):1086-1089.
24. Nazemi T, Galich A, Sterrett S, et al. Radical nephrectomy performed by open, laparoscopy with or without hand-assistance or robotic methods by the same surgeon produces comparable perioperative results. Int Braz J Urol. 2006;32(1):15-22.
25. Rogers C, Laungani R, Krane LS, et al. Robotic nephrectomy for the treatment of benign and malignant disease. BJU Int. 2008;102(11): 1660-1665.
26. Hemal AK, Kumar A. A prospective comparison of laparoscopic and robotic radical nephrectomy for T1-2N0M0 renal cell carcinoma. World J Urol. 2009;27(1):89-94.
27. Emtage JB, Agarwal G, Sexton, WJ. Robotic-Assisted Renal Surgery. Cancer Control. 2015;26:291-300..
28. Asimakopoulos AD, Miano R, Annino F, et al. Robotic radical nephrectomy for renal cell carcinoma: a systematic review. BMC Urol. 2014;14:75-82.

29. Caruso RP, Phillips CK, Kau E, et al. Robot assisted laparoscopic partial nephrectomy: initial experience. *J Urol.* 2006;176:36-39.
30. Benway BM, Bhayani SB, Rogers CG, et al. Robot assisted partial nephrectomy versus laparoscopic partial nephrectomy for renal tumors: a multi- institutional analysis of perioperative outcomes. *J Urol.* 2009;182:866-873.
31. Wang AJ, Bhayani SB. Robotic partial nephrectomy versus laparoscopic partial nephrectomy for renal cell carcinoma: single-surgeon analysis of >100 consecutive procedures. *Urology.* 2009;73:306-310.
32. Long JA, Yakoubi R, Lee B, et al. Robotic versus laparoscopic partial nephrectomy for complex tumors: comparison of perioperative outcomes. *Eur Urol.* 2012;61:1257- 1262.
33. Wu Z, Li M, Liu B, et al. Robotic versus Open Partial Nephrectomy: A Systematic Review and Meta-Analysis. *PLoS One.* 2014;9:941-950.
34. Smith A. (2014). Bladder cancer. Niederhuber JE (Ed), In: Abeloff's Clinical Oncology. (5th ed., pp. 1445-1462). Philadelphia, PA: Elsevier.
35. Menon M, Hemal AK, Tewari A, et al. Nerve-sparing robot-assisted radical cystoprostatectomy and urinary diversion. *BJU Int* 2003;92(3):232-236.
36. Zehnder P, Studer UE, Skinner EC, et al. Super Extended Versus Extended Pelvic Lymph Node Dissection in Patients Undergoing Radical Cystectomy for Bladder Cancer: A Comparative Study. *J Urol* 2011;186(4):1261-1268.
37. Stein JP, Quek ML, Skinner DG. Lymphadenectomy for invasive bladder cancer. Technical aspects and prognostic factors. II. Technical aspects and prognostic factors. *BJU Int.* 2006;97:232-237.
38. Ahmed K, Khan SA, Hayn MH, et al. Analysis of intracorporeal compared with extracorporeal urinary diversion after robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium. *Eur Urol.* 2014;65:340-347.
39. Tang K, Li H, Xia D, et al. Laparoscopic versus open radical cystectomy in bladder cancer: a systematic review and meta-analysis of comparative studies. *PloS One* 2014;9(5):e95667.
40. Parekh DJ, Messer J, Fitzgerald J, et al. Perioperative outcomes and oncologic efficacy from a pilot prospective randomized clinical trial of open versus robotic assisted radical cystectomy. *J Urol.* 2013;189(2):474-479.
41. Styn NR, Montgomery JS, Wood DP, et al. Matched comparison of robotic-assisted and open radical cystectomy. *Urology* 2012;79(6):1303-1308.
42. Tang J-Q, Zhao Z, Liang Y, et al. Robotic-assisted versus open radical cystectomy in bladder cancer: a meta-analysis of four randomized controlled trials. *Int J Med Robot.* 2017;14(1):e1867.
43. Nix J, Smith A, Kurpad R, et al. Prospective randomized controlled trial of robotic versus open radical cystectomy for bladder cancer: perioperative and pathologic results. *Eur Urol.* 2010;57(2):196-201.
44. Raza SJ, Wilson T, Peabody JO, et al. Long-term oncologic outcomes following robot-assisted radical cystectomy: results from the International Robotic Cystectomy Consortium. *Eur Urol* 2015;68(4):721-728.
45. Cata JP, Lasala J, Pratt G, et al. Association between perioperative blood transfusions and clinical outcomes in patients undergoing bladder cancer surgery: a systematic review and meta-analysis study. *J Blood Transfus.* 2017;18:1787.
46. Anderson JC, Hynes W: Retrocaval ureter; a case diagnosed pre operatively and treated successfully by a plastic operation. *Br J Urol.* 1949;21(3):209-214.
47. Schuessler WW, Grune MT, Tecuanhuey LV, et al. Laparoscopic dismembered pyeloplasty. *J Urol.* 1993;150(6):1795-1799.
48. Braga LH, Pace K, DeMaria J, et al. Systematic review and meta-analysis of robotic-assisted versus conventional laparoscopic pyeloplasty for patients with ureteropelvic junction obstruction: effect on operative time, length of hospital stay, postoperative complications, and success rate. *Eur Urol.* 2009;56(5):848-857.
49. Wang F, Xu Y, Zhong H. Robot-assisted versus laparoscopic pyeloplasty for patients with ureteropelvic junction obstruction: An updated systematic review and meta-analysis. *Scand J Urol.* 2013;47(4):251-264.
50. Wilkins MF, Wu JM. Lifetime risk of surgery for stress urinary incontinence or pelvic organ prolapse. *Minerv Ginecol.* 2017;79(2):711-717.
51. McDermott CD, Hale DS. Abdominal, laparoscopic, and robotic surgery for pelvic organ prolapse. *Obstet Gynecol Clin North Am.* 2009;36(3):585-614.
52. Westermann LB, Crisp CC, Mazloomdoost D, et al. Comparative perioperative pain and recovery in women undergoing vaginal reconstruction versus robotic sacrocolpopexy. *Female Pelvic Med Reconstr Surg.* 2017;23(2):95-100.
53. Robinson BL, Parnell BA, Sandbulte JT, et al. Robotic versus vaginal reconstructive urogynecologic surgery: a retrospective cohort study of perioperative complications in elderly women. *Female Pelvic Med Reconstr Surg.* 2013;19(4):230-237.
54. Anger JT, Mueller ER, Tarnay C, et al. Robotic compared with laparoscopic sacrocolpopexy: a randomized controlled trial. *Obstet Gynecol.* 2014;123(1):5-12.
55. Koc G, Tazeh NN, Joudi FN et al. Lower extremity neuropathies after robot-assisted laparoscopic prostatectomy on a split-leg table. *J Endourol.* 2012;26(8):1026-1029.
56. Sundi D, Reese AC, Mettee LZ, et al. Laparoscopic and Robotic Radical Prostatectomy Outcomes in Obese and Extremely Obese Men. *Urology.* 2013;82:600-605.
57. Chitlik A. Safe positioning for robotic-assisted laparoscopic prostatectomy. *AORN J.* 2011;94:37-48.
58. Kan KM, Brown SE, Gainsburg DM. Ocular complications in -assisted prostatectomy: a review of pathophysiology and prevention. *Minerva Anestesiol.* 2015;81:557-566.
59. Ahmad G, Gent D, Henderson D, et al. Laparoscopic entry techniques. *Cochrane Database Syst Rev* 2015;2:CD006583.

60. Sotelo RJ, Haese A, Machuca V, et al. Safer surgery by learning from complications: a focus on robotic prostate surgery. *Eur Urol.* 2016;69:334–344.
61. Horovitz D, Feng C, Messing EM, et al. Extraperitoneal vs transperitoneal robot-assisted radical prostatectomy in the setting of prior abdominal or pelvic surgery. *J Endourol.* 2017;31:366–373.
62. Dal Moro F, Crestani A, Valotto C, et al. Anesthesiologic effects of transperitoneal versus extraperitoneal approach during robot-assisted radical prostatectomy: results of a prospective randomized study. *Int Braz J Urol.* 2015;41:466–472.
63. Ou YC, Yang CR, Wang J, et al. The learning curve for reducing complications of robotic-assisted laparoscopic radical prostatectomy by a single surgeon. *BJU Int.* 2011;108(3):420–425.
64. Coelho RF, Palmer KJ, Rocco B, et al. Early complication rates in a single-surgeon series of 2500 robotic-assisted radical prostatectomies: report applying a standardized grading system. *Eur Urol.* 2010;57:945–952.