

Long-term Cancer Control Outcomes After Robot-Assisted Radical Prostatectomy in Pathologically High-Risk and Locally Advanced Prostate Cancer: 20 Years Report from a Single Tertiary Referral Center

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Introduction: Although the use of robot-assisted laparoscopic prostatectomy (RALP) in men with localized prostate cancer (PCa) is now quite widespread, exhaustive evidence on its long-term efficacy is still lacking in high risk and locally advanced disease. We aimed to evaluate long-term cancer control outcomes in pathologically high risk and locally advanced PCa treated with RALP at a single tertiary referral center.

Methods: Patients with pathologically high risk PCa (pT \geq 3a, pN0-1 or GG \geq 4) who underwent RALP between 2001 and 2022 were selected from our institutional database. Patients with metastatic PCa (M1) were excluded from the analysis. Kaplan-Meier method was used to estimate All-cause mortality free-survival (ACM-FS) and Additional Treatment free-survival (ATFS). The probability of cancer-specific mortality free-survival (CSM-free survival) was estimated with the competing risks method. Competing risk regression analysis was used to identify potential predictors of CSM, while Cox regression models tested the predictors of both ACM and AT after surgery.

Results: Our final cohort consisted of 803 patients who underwent RALP for high risk PCa with a median age and median follow-up time were 64 years and 72 respectively. Of all, 670 (84%), 798 (99%) and 323 (40%) had GG 4-5 PCa, pT \geq 3a PCa and pN1 PCa, respectively. Overall, 393 (48.5%) and 203 (25%) had positive surgical margins (PSM) and PSA persistence, respectively. Among the patients with adequate information about AT after surgery (n=635), 416 (65.5%) patients actually received AT. Specifically, 46 (11%), 110 (26%) and 260 (63%) underwent RT only, HT only and RT plus HT, respectively. Within follow-up, 140 deaths occurred, of which 69 were due to PCa. At 20-years of follow-up, CSM-FS and ACM-FS were 72.6% (56.8%-86.5%) and 45.1% (29.0%-59.9%), respectively. With a median ATFS time of 2.3 years, the 10 and 15-year rates of ATFS were 26.3% (22.0%-30.9%) and 17.1% (12.5%-22.3%), respectively. Among the pathological variables included in the multivariable regression models, pT3b stage was found to be an independent predictor of all adverse oncological outcomes (CSM, ATM, AT) we explored.

Conclusions: Patients with pathologically high-risk or locally advanced PCa treated with RALP seem to achieve durable long-term oncological control. Our report provides the longest follow-up after RALP for truly aggressive forms of PCa, making it a valuable resource for counselling patients on the long-term oncologic outcomes of this procedure.