



Unrecognized Pitfall When Doing Nerve-Sparing Surgery in Radical Prostatectomy

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Since the advent of nerve-sparing radical prostatectomy (RP), the goal of surgical treatment of prostate cancer has been to achieve the “pentafecta”: potency, continence, freedom from biochemical recurrence (BCR), no postoperative complications, and negative surgical margins.¹ Positive surgical margin (PSM) in RP suggests incomplete cancer excision and may lead to a detrimental prognosis.² PSM has been reported in 11–40% of men who underwent RP and is associated with a worse prognosis and a higher risk of receiving a secondary treatment compared with negative surgical margin.³ It is necessary to resect tumor tissue widely with enough surrounding tissues of the prostate to avoid PSM for better cancer control. Meanwhile, preserving tissues such as nerve is important for recovery of potency and continence.⁴ Therefore, this conflicting situation causes a challenge during RP, needing to investigate the impact of PSM in nerve preservation. However, the clinical significance of PSM after RP is controversial, with 27–44% of patients developing BCR, 6.8–24.3% with systemic progression, and prostate cancer-related mortality ranging from 0.8% to 3.7% within 7–13 years of follow-up.³ So far, several parameters associated with PSM, including Gleason grade and margin length at PSM as well as the location of PSM, were reported to be associated with BCR after RP.^{3,5} Among these PSM-associated parameters, in a study by Matsuda et al., the

impact of nerve sparing in RP on the location of PSM and its effect on BCR was investigated, and two important findings are reported.⁶

One finding is that PSM in the anterior apex was not associated with the risk of BCR after RP.⁶ So far, there has been accumulating evidence that PSM at the apex had a weaker association with increased BCR risk compared with other locations.^{7,8} This has been attributed to a few reasons, including that the apex lacks a well-defined capsule, has fewer periprostatic tissues, undergoes stronger retraction during RP than other regions, and tends to have pathological artifacts, as the authors mention.⁸ The present study reports that the impact of PSM at the anterior apex is not associated with an increased risk of BCR, although the data on PSM risk at the lateral, posterolateral, and posterior apex are not shown.⁶ A possible cause is that the anterior region of the apex is in contact with the rhabdosphincter and there is no extra tissue to resect, resulting in tumor exposure at resected surface although the tumor is completely removed. Otherwise, tumors in the anterior apex may be biologically less malignant.

Another finding is that a high prevalence of PSM at the contralateral side in unilateral nerve sparing is associated with increased BCR risk if PSM is detected at the nonanterior apex.⁶ So far, it has been considered that PSM at the contralateral side in unilateral nerve sparing is equivalent to PSM when nerve-sparing surgery is not performed. This is the first study that has investigated the contralateral PSM during unilateral nerve sparing, as the authors mention. Surprisingly, the results show that there was more PSM on the contralateral side in unilateral nerve sparing. This result raises the possibility of insufficient resection at the non-nerve-sparing side. The nerve-sparing procedure can be subclassified according to the amount of tissue left on the prostate.⁹ Depending on the requirement of nerve preservation by the patients and the risk estimation by nomogram

and the finding on multiparametric magnetic resonance imaging, the grade of nerve sparing should be optimized.⁹ According to the result in this study, resection at the non-nerve-sparing side may be unintentionally performed in a layer of partial nerve preservation, even though the high-risk tumor is located at the non-nerve-sparing side. Therefore, this study suggests that it is necessary to perform nerve preservation consciously in a different layer on the contralateral side according to cancer risk and the patient's desire. Intraoperative frozen section may be useful to reduce the risk of PSM, although the benefit in reducing BCR has not been indicated.¹⁰ Also, emerging new technologies such as intraoperative fluorescence microscopy may assist to reduce PSM in the future.¹¹

Thus, this study not only carries further implications on the impact of PSM location on BCR but also alerts to a pitfall in PSM at the non-nerve-sparing side during unilateral nerve sparing to improve cancer control. However, the experience and skill of surgeons as well as an approach such as open RP versus minimally invasive RP (laparoscopic RP and robot-assisted RP) are known to affect the PSM rate and location of PSM.^{5,12} Therefore, the data on these points are important to precisely interpret the result. In addition, long-term studies on the impact of location of PSM in nerve-sparing RP are needed, not only for BCR but also for other outcomes such as metastasis-free survival, cancer-specific survival, and overall survival.

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