

STRIATED MUSCLE IN RADICAL PROSTATECTOMY SPECIMENS: IS IT PREDICTIVE OF POST-PROSTATECTOMY URINARY INCONTINENCE?

Hypothesis / aims of study

Urinary incontinence (UI) following radical prostatectomy for prostate cancer has become an increasing concern due to the rising number of prostatectomies being performed and the burden it places on quality of life. Studies have reported incontinence following prostatectomy ranging between 2 to 50%, although the definition of incontinence and reporting patterns have been variable. It is believed that incontinence is secondary to sphincter injury, as older men have thinner muscle and more collagen. Currently, little is known about the risk factors for the development of UI and how to predict its occurrence following surgery. We hypothesized that the amount of striated muscle removed with the apical aspect of the prostate at prostatectomy can be predictive of post-prostatectomy UI.

Study design, materials and methods

The records of 61 consecutive patients seen in follow-up after radical prostatectomy were reviewed. Complete clinical data, including age at surgery, prostate volume on TRUS, surgeon, approach (open, laparoscopic, or robotic), nerve-sparing status, prostate weight, pathological stage and grade, positive surgical margins, salvage radiotherapy, and length of follow-up were collected. Two uropathologists reviewed the H&E sections of the apical margin to semi quantitatively assess the amount of striated muscle (SM) according to the following scheme: 0 - no SM, 1 - 1-10% SM (of total tissue), 2 - 11-30% SM and 3 - > 30% SM. At our institution, the apical margin is defined as the distal 3 mm around the urethra. This section is divided into left and right halves, sectioned perpendicularly and submitted in two paraffin blocks. The SM scores for the two halves were averaged to give a final SM score for each case. Continence status was determined based on the last clinical visit, with UI considered any reported leakage. Student's t-test was used to statistically compare continuous variables and chi-square test to compare categorical variables. All differences with a p value less than 0.05 were considered statistically significant.

Results

Patients had a median age of 62 years at surgery (SD +/- 6.34, range 43-73) and had a median follow-up after surgery of 23 months (SD +/- 18.43, range 1-77). 21 of 61 (34.4%) patients reported urinary incontinence at the time of the last follow-up. On TRUS the average prostate volume was 36.58 cc (SD +/- 13.22, range 15.27-72.57) and the average prostate weight on pathology was 46.92 g (SD +/- 14.26, range 26.70-98.00). A SM score of ≥ 2 had a specificity of 97.5% and sensitivity of 19.0% (Figure 1) for incontinence (LR 7.619, $p = 0.0437$). Age at surgery (mean 64.10 vs 60.63, $p = 0.0413$), prostate volume on TRUS (mean 42.06 vs 33.85, $p = 0.0257$) and prostate weight (mean 52.51 vs 43.99, $p = 0.0489$) were associated with an increased risk for UI. Surgeon, surgical approach, nerve-sparing status, pathology (stage, grade, surgical margins), salvage radiotherapy, and length of follow-up were not found to have a significant effect on continent status.

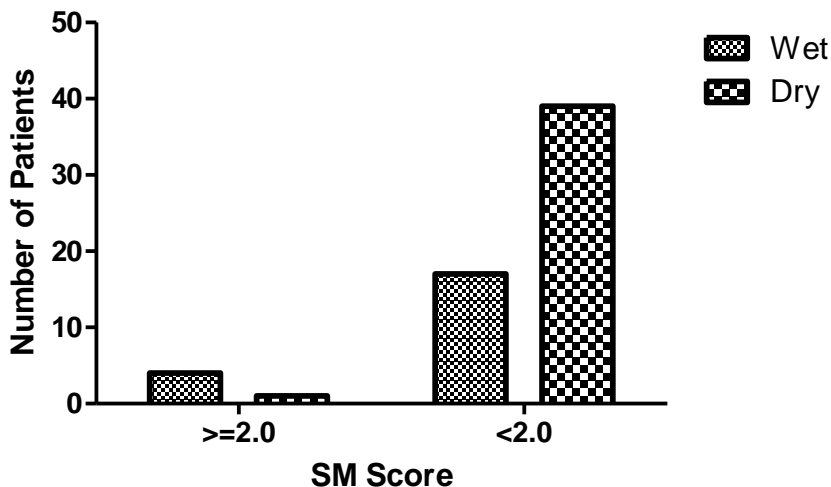


Figure 1. SM score predictive for incontinence following radical prostatectomy.

Interpretation of results

It has been suggested that the preservation of the striated sphincter during apical dissection of the prostate can prevent the development of urinary incontinence, but this is the first study to quantify and grade the amount of muscle resected and correlate it with incontinence. In our study, an SM score above 2 was predictive for incontinence with a specificity of 97.5%. This tool could be utilized during the initial postoperative visit when reviewing pathology with the patient to discuss the risk of incontinence and as well as early measures to improve incontinence. Our study also found that patient age and prostate size (weight and volume) were predictive of incontinence, factors that have been found in previous studies as well. These variables can be identified prior to surgery and should be incorporated into the decision making process when obtaining consent for

surgery. Interestingly, variables which have been reported to be associated with incontinence after radical prostatectomy were not significantly associated in our study.

Concluding message

The amount of striated muscle seen in the pathology specimen following radical prostatectomy has a significant effect on post-operative UI. An average SM score of 2 or more had a 97.5% specificity for UI. Age at surgery and prostate volume/weight were also found to be risk factors for incontinence. This could be utilized in the future to predict and counsel patients following surgery.

Disclosures

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