

CORRELATIONS OF CALCULATED TOTAL PROSTATE VOLUME FROM TRANSRECTAL ULTRASONOGRAPHY WITH EITHER COMPUTED TOMOGRAPHY OR MAGNETIC RESONANCE IMAGING IN MALE PATIENTS WITH ANORECTAL CANCER WHO UNDERWENT RECENT SURGERY

Hypothesis / aims of study

Transrectal ultrasonography (TRUS) is a popular method for measuring prostate volume and for evaluating a detailed prostatic imaging anatomy. However, TRUS is not available under certain conditions such as the presence of anal strictures, recent surgical history of colorectal surgeries or Miles operation. In such cases, an alternative imaging modality such as CT or MRI is an option to determine prostate volume. [1,2]

The study is aimed to evaluate the value of contrast used in computed tomography (CT) and magnetic resonance imaging (MRI) in determining total prostate volume (TPV) preoperatively or postoperatively as an alternative to transrectal ultrasonography (TRUS) when TRUS is not available in patients with anorectal cancer that underwent anorectal surgery.

Study design, materials and methods

An anorectal cancer patient cohort with complaints regarding postoperative voiding included 131 patients who completed IPSS questionnaires from July 2006 to March 2016 at a single cancer institution. Patients underwent either CT or MRI preoperatively and postoperatively within a three month interval after preoperative TRUS. CT/MRI imaging was reviewed repeatedly twice by two independent participants with a time interval of one month after initial evaluation. Prostate length and width were measured on axial images, while height was measured on sagittal images. To analyze the correlations of TPV from CT and MRI with TPV from TRUS and interobserver and intraobserver variability tests, Spearman/Pearson correlation analyses and Bland-Altman plot were statistically evaluated.

Results

The mean age of patients was 71.0 (± 9.3 , SD) years. Mean pre/post-operative PSA levels were 17.9 (SD30.2)/34.6 (SD26.1) ng/dl. The mean preoperative and postoperative scores per the International Prostatic Symptom Score were significantly different with a total score of 9.3/15.8 and with quality of life score of 3.0/5.2, respectively. Mean time interval between CT and TRUS was 27.3 (± 22.0) days. Median preoperative TRUS-measured TPV were 25.0 mL, whereas median first and second person's CT/MRI-measured TPVs were 43.4/30.1 mL and 42.1/35.1 mL, respectively.

CT and MRI-measured TPV overestimated the TRUS-measured TPV by about 10-20%. The TRUS volume was significantly well correlated for preoperative CT-/MRI-measured TPV (correlation coefficient $> 0.7-0.9$), whereas postoperative CT-/MRI-measured TPV were not significantly well correlated (correlation coefficient 0.2854-0.5272). In stratified TPV with < 30 mL or ≥ 30 mL, the TPV correlation analyses was significantly better with preoperative CT-measured TPV in TPV < 30 mL, whereas preoperative CT-/MRI-measured TPV were significantly better correlated with TRUS-TPV (correlation coefficient $> 0.6-0.7$).

Interpretation of results

Although CT and MRI overestimate TRUS, CT or MRI can be used as an alternative to TRUS according to the size of TPV when TRUS is not applicable.

Concluding message

Preoperative CT is a reliable method for TPV measurement, and is well correlated with TRUS, whereas MRI is a reliable method in a preoperative setting only for TPV ≥ 30 mL. Although CT and MRI overestimate TRUS, CT or MRI can be used as an alternative to TRUS according to the size of TPV when TRUS is not applicable.

References

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2. Badiozamani KR, Wallner K, Cavanagh W, Blasko J. Comparability of CT-based and TRUS-based prostate volumes. *Int J Radiat Oncol Biol Phys* 1999;43:375-8.

Disclosures

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