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Imaging and T Category for Prostate Cancer in the 8th Edition of the Union for International Cancer Control TNM Classification

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What's in a name? All the world is a stage

The first requirement for clinical management of prostate cancer is to classify patients into prognostic groups to aid in decision-making on treatment options. Of all prognostic factors that determine outcomes after prostate cancer treatment, the anatomic extent of disease is one of the most important, but certainly not the only factor. “Stage”, in truth, means nothing more than the anatomic extent of disease. Standardisation of clinical staging allows comparison of populations and is therefore crucial in public health and epidemiology and routine clinical practice, as well as in the design of clinical trials. A careful description of the tumour characteristics on which to build a staging system is mandatory. TNM staging is currently considered the cornerstone of tumour classification and is regularly updated as novel information provides sufficient evidence to underpin a change. Despite its many inconsistencies, TNM as a concept is a pragmatic albeit imperfect system that has stood the test of time.

To improve outcome prediction and for clinical management, stage has to be combined with other prognostic factors—notably prostate-specific antigen (PSA) level and Gleason score or International Society of Urological Pathology (ISUP) grade—to produce a prognostic risk stratification that will ultimately determine treatment. A common misconception is that stage (and TNM categories) are the same as a prognostic classification. They are not; rather, TNM categories (ie, the anatomic extent of disease) merely represent a major component of prognostic classification. This is acknowledged by both the Union for International Cancer Control (UICC) and American Joint

Committee on Cancer (AJCC) versions of the TNM classification for prostate cancer. To combine stage with nonanatomic prognostic factors, something further is needed; the UICC defines only a stage group, and notes major nonanatomic factors such as PSA and grade, while the AJCC version has what is termed a “prognostic stage group” classification that (like the d’Amico risk classification) overtly incorporates factors other than extent of disease. The European Association of Urology (EAU) guidelines recommend following the UICC version of the classification, and it is important for public health and epidemiology not to confuse “stage” and “prognostic stage group”.

Imaging for extent of primary disease

Across the world and across all cancer sites, there is variation in the way in which imaging is performed to assess tumour extent. In the case of lung cancer, for example, information from cross-sectional imaging can be used to help define a clinical T or N category. In the case of prostate cancer, prostate imaging was often incorporated in the clinical T category, but this introduces many inconsistencies. First, there are great variations in the availability, quality, and expertise for prostate imaging (eg, with multiparametric magnetic resonance imaging [mpMRI]). Second, while modern imaging will identify patients who, for example, have subtle and early evidence of extraprostatic extension, these patients are manifestly different to patients with gross evidence of extraprostatic extension that is palpable via digital rectal examination (DRE). Simply calling them both “cT3” is an example of stage migration, and will mean that the radiologically staged patients have a far better prognosis and (arguably) might be overtreated in

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comparison to those whose locally advanced disease is clinically palpable. This is why, for the 8th TNM edition, imaging is no longer used to define the T category for prostate cancers [1].

What you record and what you use need not be the same as what is reported to the cancer registry

The new EAU prostate cancer guidelines for 2019 now recommend mpMRI early in the diagnosis of prostate cancer, even before carrying out the first biopsy. Early diagnosis and possibly accurate delineation of the intraprostatic extent of prostate cancer can be improved by mpMRI [2,3]. Should mpMRI findings be incorporated into future editions of the TNM classification? Perhaps the time will come when advanced imaging is widely available and when precise delineation of intraprostatic disease volume makes a crucial difference to local treatment worldwide, but for organ-confined disease at least, it is unlikely to impact in a major way on overall survival when other factors such as PSA and ISUP grade are accounted for. The sensitivity of mpMRI in identifying microscopic extracapsular growth is low, but mpMRI is superior in predicting established extracapsular growth on histology compared to nomograms and clinical staging [4]. Current nomograms include clinical T stage mainly based on DRE [5–7], and therefore an incorrect prediction may be obtained when MRI is included in T staging. However, prediction of histologic outcome using a nomogram can be improved by separately adding mpMRI data [8]. A radiologic risk signature based on mpMRI was a better predictor of biochemical recurrence after prostatectomy when compared to the classic Kattan nomogram [9] and the use of mpMRI instead of DRE for clinical staging improved the prediction of nodal metastases [10]. Therefore, recording the extent of disease in the prostate as assessed via mpMRI is perfectly justifiable, but if used it should be added in a descriptive format rather than assigning and reporting a T category based on the imaging results. It is important to distinguish between what is reported, for example, if UICC TNM stage is used for public health surveillance, and what is used, for example, in daily practice. The exclusion of imaging from cT categorisation in no way means that imaging should not be carried out or that the information should not be used for clinical decision-making. It should be remembered that the UICC TNM classification is intended to be used worldwide, but sophisticated imaging such as mpMRI is most certainly not yet available worldwide.

An additional argument for routine prostate imaging in clinical practice is that with DRE, only the dorsal side of the prostate can be reliably palpated. Therefore, inclusion of imaging information from mpMRI alongside T categorisation has the potential to improve the accuracy of clinical assessment, especially where there is an anterior tumour. Again, however, such findings from imaging modalities should be used but reported as a description of the observations rather than used to assign and report a T category.

Conclusions

The EAU prostate cancer guidelines give specific recommendations about when to use imaging and what sort of imaging to use. We must not expect TNM classification to be a one-stop repository for all staging and prognostic information, nor should we imply that patients should only undergo the assessments that feature in the TNM classification.

Confusion undoubtedly exists regarding the use of imaging data in defining and recording T category. This article is written to draw attention to this and to stress the importance of a uniform approach to T-category assignment. Image the prostate using modern MRI by all means and use the results in directing clinical management, but only the DRE result should be recorded for assigning a TNM clinical stage.

Conflicts of interest: The authors have nothing to disclose.

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