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GRAPHICS SECTION

Problems in Staging Prostate Cancer

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Staging is extremely important in assessing mortality and morbidity risk for any cancer. The diagram, table and this discussion are meant to help illustrate and explain some of the difficulties associated with prostate cancer staging.

First, clinical staging in the absence of pathology reports of the prostate gland is frequently inaccurate. One study[1] found that 66% of clinical stages were upgraded (worsened) after pathologic examination. Information given in Table 1 shows the need for pathological staging. Clinical staging often involves guesswork. This has particular importance for us in underwriting as external radiation therapy, brachytherapy and watchful waiting gain in popularity.

Next, there is the problem of 2 different staging classifications. The American Urological Association established the modified Whitmore-Jewett A through D staging system. For consistency with other cancers, the American Joint Committee on Cancer (AJCC) recommends use of the TNM system. T1 equates with stage A, T2 with stage B, and T3 and T4 with stage C. Table 1 compares the 2 classifications.

Another major problem in prostate cancer staging is that different subsystems coexist within the same classification, especially relating to T2 (stage B) cancers. Some prefer the simpler T2a and T2b (stage B1 and B2). Here, T2a (B1) applies when 1 lobe or less is involved. Some include a volume limit of 1.5 cm. T2b (B2) indicates both lobes contain cancer or volume of more than 1.5 cm. My own preference, because it gives more information, is a 3-tier division of T2 (stage B) cancers. By definition, T2a (B1) involves less than half of 1 lobe (1.5 cm or less), T2b (B2) signifies cancer in over half of 1 lobe, and T3c (B3) indicates bilateral cancer.

T1a and T1b (stages A1 and A2) cancers are seen less frequently as PSA and prostate biopsies are used for diagnosis more frequently. By definition, T1a and T1b (stages A1 and A2) indicate previously undetected prostate cancer that is discovered by transurethral resection of the prostate. In contrast, T2 (stage B) cancers are palpable on digital rectal examination or by imaging but are presumably limited to the prostate gland. When cancer is found in prostate biopsies performed because of abnormal PSA readings,

Table 1. Comparison of AJCC TNM Staging and AUA (Modified Whitmore-Jewett) Classification of Prostate Cancer

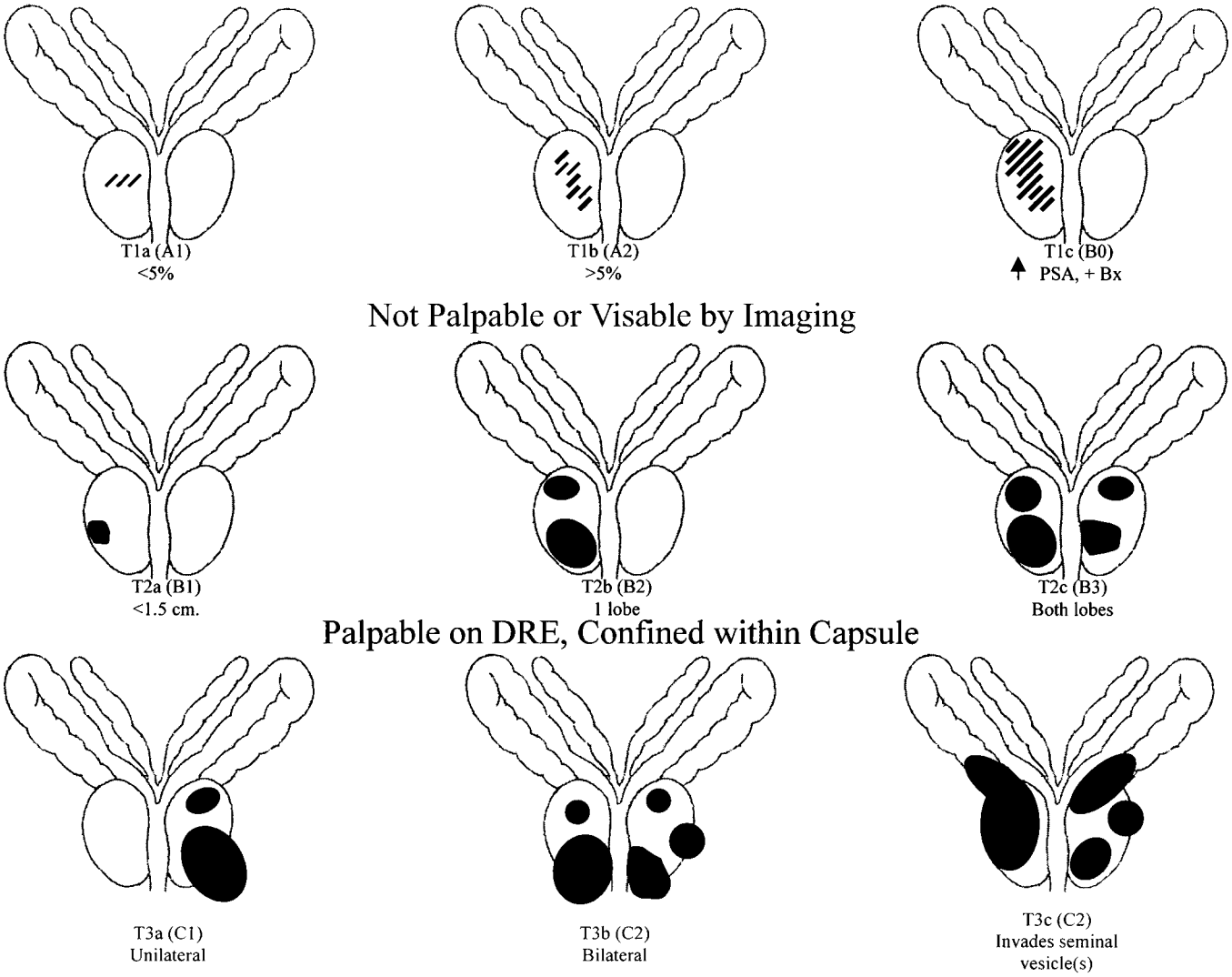
T1 (Stage A)—Clinically inapparent, not palpable or visible by imaging
T1a (A1)—Incidental histologic finding in less than 5% of resected tissue (or in 1–3 foci) of well differentiated or moderately well differentiated carcinoma.
T1b (A2)—Incidental histologic finding of cancer in more than 5% of resected tissue or poorly differentiated carcinoma regardless of volume.
T1c (B0)—Cancer identified by needle biopsy (primarily because of elevated PSA values) but not palpable or visible by imaging.
T2 (Stage B)—Cancer palpable on rectal examination and confined to prostate
T2a (B1)—Involves half a lobe or less (1.5 cm or less in diameter)
T2b (B2)—Involves more than half a lobe but not both lobes
T2c (B3)—Involves both lobes
Alternate T2 (Stage B) Cancer palpable on rectal examination and confined to prostate
T2a (B1)—Confined to 1 lobe (and some say less than 1.5 cm in diameter)
T2b (B2)—Involves both lobes (and some say more than 1.5 cm in diameter)
T3 (Stage C)—Cancer extends through the prostate capsule
T3a (C1)—Extends unilaterally
T3b (C2)—Extends bilaterally
T3c (C2)—Invades seminal vesicle or vesicles
T4 (Stage C2) Cancer is fixed or invades adjacent structures other than seminal vesicles
T4a (C2)—Invades bladder neck, external sphincter and/or rectum
T4b (C2)—Invades levator muscles and/or is fixed to pelvic wall
N+ (Stage D1)—Positive regional lymph nodes
M+ (Stage D2)—Distant metastases
Residual Tumor (R) Classification
RX—Residual tumor cannot be assessed
R0—No residual tumor
R1—Microscopic residual tumor
R2—Macroscopic residual tumor

the 2 classifications are inconsistent. In the TNM system, these cancers are called T1c. In the AUA system, they are classified B0.

T3 (stage C) cancers may also have differing definitions. These differences tend to give us fewer difficulties in underwriting because these patients have a poorer prognosis. As noted in the table, TNM classification provides better discrimination for T3 and T4.

Yet another problem is whether cancer in the prostate capsule is T2 (stage B) or T3 (stage C). In 1992, a panel of experts[2] recommended that cancer invading the capsule but not spreading completely through the capsule be classified T2 (stage B). Cancer cells that have penetrated through the capsule rightfully should be classified T3 (stage C). However, 2 points should be noted. First, the prostate capsule consists of fibromuscular tissue of variable thickness and not a single layer capsule. Thus, interpretation may sometimes be difficult. Secondly, 1 study[3] noted that a very small amount of cancer extending through the capsule behaves similarly to T2 (stage B) cancers. This is somewhat similar to minimal microscopic invasion of breast cancer (microinvasion), which barely penetrates the basement membrane of an otherwise intraductal carcinoma.

Perhaps the greatest current problem in staging is the fact that T1 and T2 (stage A and B) may be used interchangeably. Since prostate cancer is now most frequently diagnosed by elevated PSA levels followed by needle biopsy (approximately 80%) rather than by transurethral resection prostate



Comparison of AJCC TNM and AUA Prostate Cancer Staging System. Prostate diagram template used with permission of the American Joint Committee on Cancer (AJCC), Chicago, Ill. Original source is the AJCC Cancer Staging Manual, 6th ed (2002), published by Springer-Verlag, New York, (wwwspringer-ny.com).

(TURP), there may be some wisdom in evaluating our cases as confined to the prostate (T1 and T2 or stages A and B) or not confined (T3 and T4 or stages C and D). Other than T1a (stage A1) where only a minimal amount of well differentiated or moderately well differentiated prostate cancer is present, the real issue is whether the cancer is extensive and/or bilateral or more localized.

For underwriting, it may be better to assess whether the cancer is unilateral or bilateral, and whether it has penetrated the capsule. If unilateral, is the cancer focal or extensive? Are the margins of resection clear of tumor or is the cancer very near the margins of resection? This type of complete interpretation requires reading the pathology report in detail. Fortunately, there is a trend toward more complete gross and microscopic descriptions. Reports may include the percentage of total specimen that contains cancer and even helpful diagrams.

In summary, after reading the complete pathology report, decide whether the cancer is confined to the prostate gland. If confined, is it localized or extensive? Localization and limited extent are favorable prognostic factors, but always in combination with assessment of Gleason grade. Prostate cancers with total Gleason grade of 7 through 10 can have

poor prognosis regardless of stage.[4,5] Survival studies are of value only if the Gleason grade is included in staging statistics.

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