

in endorectal-coil MRI may offer some improvement. Prostate cancer that has metastasized to the pelvic lymph nodes is a problem because of the lack of resolution of small lesions by CT or MRI scans. Skeletal metastases are readily identified in the majority of patients with radionuclide bone scanning.

In an era of increased interest in cost containment, a pragmatic approach to the staging of prostatic carcinoma includes a carefully performed digital rectal examination, examination of the pathological grade of the biopsy specimen, and measurement of serum PSA level. Most patients with carcinoma extension beyond the prostate can be identified with rectal examination. High-grade carcinoma or carcinoma present on multiple systematic sector biopsies (performed under ultrasound guidance) suggest that one may be dealing with advanced local or, indeed, metastatic disease. A serum PSA level of 10.0 ng/mL or greater (when performed prior to significant prostatic perturbation) is an ominous prognostic finding—the majority of such patients have either advanced local^{1,2} or metastatic disease.^{4,5}

My personal approach in patients with well-differentiated or moderately differentiated carcinoma and a PSA level less than 10.0 ng/mL is to perform no additional staging studies prior to radical prostatectomy or referral for radiation therapy. Patients with high-grade carcinoma, with carcinoma in multiple systematic sector biopsies, or with a serum PSA level of 10.0 ng/mL or higher undergo radionuclide bone scanning. I reserve pelvic imaging studies for those patients with a serum PSA level of 20.0 ng/mL or higher.

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Adverse Reactions to Tetanus Toxoid

Q A patient, previously immunized in the military, received a tetanus toxoid booster vaccination that resulted in a painful, erythematous upper extremity, with several days of fever and lassitude. If he has a penetrating injury in the future, what should be done?

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A Although few details of this patient's adverse event following vaccination are available, in general, adverse reactions following tetanus toxoid may be influenced by the

number of previous doses, the toxoid dosage, the route and method of administration, and the presence of adjuvants and/or other antigens (such as diphtheria toxoid) in the preparation chosen. The most common adverse event following tetanus booster vaccination (in 50% to 85% of recipients) is a local reaction characterized by pain and tenderness at the injection site, less frequently (in 20% to 30%) followed by edema and erythema, and rarely (less than 2%) marked by considerable swelling.¹ Several studies have found a direct correlation between the circulating tetanus antitoxin level and the degree of local reaction. A few reports have described massive local reactions (eg, associated with swelling from elbow to shoulder), occurring primarily in persons receiving multiple booster doses of toxoid. Generally, these reactions begin within 2 to 8 hours after the injection. Circulating antibody apparently forms complexes with the deposited toxoid to induce an inflammatory response (Arthus reaction, type II hypersensitivity). Fever can accompany a local response (in 0.5% to 7%), particularly when local reaction is marked or antitoxin levels are high, or both. However, a temperature higher than 39°C is rare, and other systemic symptoms, such as headache or malaise, are rarely reported. The preservative used in tetanus toxoid (ie, thimerosal) can lead to delayed-type hypersensitivity, while serum-sicknesslike illnesses appear to be rarely associated with tetanus toxoid.

This patient most likely experienced an Arthus-type reaction, probably caused by multiple previous doses of the toxoid that resulted in high levels of circulating tetanus antitoxin. Assessment of tetanus antitoxin levels could substantiate the diagnosis and assist future management in the event of a penetrating injury. If high levels of tetanus antitoxin are found, the patient should be protected for at least 10 years, and tetanus toxoid should not be administered during this period. If tetanus antitoxin levels are low, the patient should be evaluated by an immunologist or allergist; tetanus immunoglobulin could be used in the event of a tetanus-prone wound to provide short-term protection until tetanus toxoid can be safely administered. To prevent such reactions, tetanus toxoid should not be administered routinely more frequently than every 10 years as recommended by the Advisory Committee on Immunization Practices.²

To better monitor the risk and nature of serious adverse events following vaccination (including vaccination with tetanus toxoid), physicians are requested to report these events to the Vaccine Adverse Event Reporting System. Report forms and additional information on reporting may be obtained by telephoning (800) 822-7967.

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