has improved and infection is controlled, then permanent or definitive measures can be planned and carried out electively and more safely.

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Serum Markers for Detecting Testicular Tumors

RADIOIMMUNOASSAY has made possible the accurate measurement of serum α-fetoprotein (α-FP) and β-human chorionic gonadotropin (β-HCG). These serum markers are elevated in a significant number of patients having testicular tumors originating from germ cells. When used together, these markers have been found to be elevated in 70 percent to 94 percent of patients with nonseminomatous germ cell tumors, such as embryonal cell carcinoma, teratocarcinoma and choriocarcinoma. With pure seminoma, the most radiosensitive of the testicular tumors, elevation of β-HCG has been noted in 5 percent to 10 percent of cases. The source of this elevation is thought to be syncytiotrophoblastic giant cells interspersed in the seminoma. The detection of an elevated α-FP in what is thought to be pure seminoma, however, indicates the need for a further search for other tumor elements.

α-FP is a glycoprotein produced by fetal yolk sac, liver and some gastrointestinal tract cells. It is present in the human fetus and reaches low levels (less than 40 ng per ml) by 1 year of age. In addition to elevated levels in patients with testicular embryonal cell carcinoma and teratocarcinoma, α-FP elevations have been noted in patients with hepatocellular, pancreatic, gastric and colonic carcinoma as well as those with Laennec cirrhosis.

Human chorionic gonadotropin, a glycoprotein composed of an α and β chain, is normally secreted by the placenta. Germ cell tumors of the testis often contain specialized cells capable of HCG production. Earlier methods were able to detect HCG in only 20 percent to 30 percent of nonseminomatous tumors whereas a 40 percent to 60 percent detection rate is now possible for β-HCG, based on a technique using an antibody to the β chain.

Clinically, these tumor markers have aided in the preoperative evaluation of testicular masses; for example, elevated values are strong evidence of a neoplasm. While the half-life of α-FP is approximately five days and that of β-HCG is 16 hours, a waiting period of two to three weeks following orchiectomy is advised before these tests are repeated. Persistent elevation of these serum markers indicates residual disease in a patient following orchiectomy. Also, reappearance of elevated markers that had previously returned to normal levels generally indicates recurrence of the disease. The larger the tumor burden, the more likely the elevation in the level of serum markers.

Perhaps the most valuable use of these tumor markers is in detecting residual or recurring tumors in patients with nonseminomatous germ cell tumors who have had stage I (confined to the testis) or stage II (tumor present in retroperitoneal lymph nodes) disease. In addition, in patients with stage III disease (advanced metastasis), response to radiation or chemotherapy can be monitored by checking the serum levels of these marker proteins.

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Immediate Versus Delayed Endocrine Therapy for Prostatic Carcinoma

IN 1941 Huggins and Hodges reported the almost miraculous response of cases of far advanced prostatic carcinoma to treatment with diethylstilbestrol (DES). Following this report endocrine manipulation became the accepted treatment for patients with prostatic carcinoma. Treatment involved DES therapy, an orchiectomy, or both, and was started as soon as the diagnosis was made. In 1967 the Veterans Administration Cooperative Urological Research Group reported that patients with early prostatic carcinoma (stages I and II) who were given DES had a shorter survival time than those given a placebo and suggested that endocrine manipulation be withheld until the severity of symptoms necessitated relief.

Our retrospective study agrees with their conclusions. The 15-year survival rate of patients with stage I and II lesions was 24 percent (23 of 95)

for those receiving therapy when the diagnosis was first made and 32 percent (16 of 50) for those receiving therapy when symptoms were noted.

However, the survival rate of patients with far advanced prostatic carcinoma (stages III and IV), who were seen between 1927 and 1941 and who had had endocrine manipulation after 1941, was 62 percent at five years and 31 percent at ten years. The survival rate was only 23 percent at five years and 0 percent at ten years for patients who had not received endocrine therapy.

Therefore, there is evidence that endocrine therapy for patients with prostatic carcinoma should be given only when symptoms from the extension of the neoplasm develop. Approximately 80 percent of patients will respond to treatment at this time.

Bilateral orchiectomy is usually preferable to DES therapy because of the following: (1) there is no aggravation of cardiovascular disease, (2) there are fewer feminizing changes and (3) treatment is usually more effective and longer lasting. In addition, leaving the epididymis intact when orchiectomy is done causes less psychological trauma than removing the entire contents of the scrotum.

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Klein LA: Prostatic carcinoma. N Engl J Med 300:824-833, Apr 12, 1979

Abdominal Staging Methods for Study of Testicular Tumors

RECENT ADVANCES in the study of testicular tumors include the discovery of reliable serum markers and the development of effective chemotherapy. These advances are causing renewed interest in nonsurgical staging methods and a reassessment of recommendations for treatment of low-stage, nonseminomatous germ cell testicular tumors. Because nonoperative abdominal staging methods are inadequate, the ability of abdominal ultrasonography (US) and computed tomography (CT) to predict retroperitoneal metastasis was studied in 36 patients with testicular tumors.

CT was completed in 32 patients and US in 21 within a month before surgical removal and pathological examination of retroperitoneal lymph nodes. The pathological diagnosis was correctly predicted by CT in 28 of the 32 patients (87 percent) and by US in 17 of the 21 patients (81 percent). By both modalities, the three false-positive diagnoses were for patients with minimally enlarged nodes and the false-negative diagnosis was for a patient with microscopic tumor. Comparison by pathological staging showed that stage I disease was predicted correctly by CT in 13 of 16 patients (81 percent) and by US in 4 of 6 patients (67 percent). In stage II disease, 12 of 13 cases (92 percent) were correctly predicted by CT and 11 of 12 cases (92 percent) by US. In stage III disease diagnosis by both US and CT was correct in all three patients. The sensitivity (accuracy in detecting tumorous nodes) of both CT and US was 93 percent. However, the specificity (accuracy in detecting tumor-free nodes) was 82 percent by CT and 57 percent by US.

It was concluded that both US and CT are reliable techniques for pretreatment assessment of the status of retroperitoneal lymph nodes in patients with nonseminomatous germ cell testicular tumors. Of the two methods, CT is slightly more accurate, definitely more specific and, when available, is the recommended study. Inasmuch as neither US nor CT is capable of detecting microscopic disease, retroperitoneal lymphadenectomy continues to be the most reliable staging technique.

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Detection of Specific Prostatic Acid Phosphatase

CONVENTIONAL METHODS for the detection of elevated levels of serum acid phosphatase in patients with prostatic cancer have used a variety of enzyme substrates and inhibitors of the prostatic fraction of acid phosphatase. This indirect measurement of the prostatic contribution to acid phosphatase activity is subject to error and variation because of the many isoenzymes of acid phosphatase present in serum.

Newer immunologic techniques have produced antibody to prostatic acid phosphatase (PAP) itself and have made possible more specific, sen-