I. INTRODUCTION

The incidence of testicular tumors in general populations is 2 per 100,000, but in the age group of 18 to 34 deaths from testicular tumors are 7 per 100,000 the highest incidence of deaths from malignancy in this group.

Testicular tumors are generally classified as sex cord/stromal tumors, germ cell tumors, secondary tumors and adnexal tumors. The last two groups are quite rare and the presentation will be limited to the first two groups.

2. SEX CORD/STROMAL TUMORS

Sex cord/stromal or gonadal stromal tumors constitute about 6% of testicular tumors. They consists of Leydig cell, Sertoli cell, theca and granulosa cell tumors and admixtures. Leydig and Sertoli cells are present normally in the testes, granulosa, theca and lutein cells in the ovary. Leydig cells produce androgenic and estrogenic substances and corticosteroids. Sertoli cells are the main sources of estrogenic hormones in man but may produce androgens as well. In the female theca and granulosa cells are the main source of estrogens and lutein cells may produce androgenic hormones as well. The tumors of these cell types occur in either sex and recapitulate the hormone production in the normal.

In children, Leydig cell tumors have been invariably associated with macrogenitosomia; in adults about 40% of men manifest feminizing symptoms consisting of uni or bilateral gynecomastia and loss of libido. In older men with Leydig cell tumors or with Leydig cell tumor metastases, there may be a sensation of well being.

Serum and urine demonstration of markers in these tumors has been of limited value in the clinical management of these patients because unless the patient manifests some endocrine disturbances, he is apt to have an orchiectomy.

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before these markers are investigated.

Tissue demonstration of the markers may be valuable in differential diagnosis of these tumors especially in patients without endocrine disturbances. Testosterone, androstenedione, estradiol and progesterone can be demonstrated in Leydig cell tumors and estrogenic hormones in the others.

3. GERM CELL TUMORS

Germ cell tumors constitute 94% of testicular tumors. Pathological classification of these tumors, their histogenesis, the role of tumor markers in diagnosis and prognosis, the exact site of the markers, have all elicited much disagreement, discussion and confusion.

As far as the classification is concerned, throughout the years there have been several American and British classifications, a Scandinavian, a French and a Russian classification.

In the American Testicular Tumor Registry sponsored by the American Urological Association at the AFIP we have employed the WHO International Histological Classification of Testicular Tumors. This classification separates the tumors into those of a single histological type and those of more than one histological type. Seven basic histologic types are recognized: Seminoma (S), Spermatocytic Seminoma (SS), Embryonal Carcinoma (EC), Yolk Sac Tumor (YST), Polyembryoma, Choriocarcinoma (CC) and Teratoma. Teratoma is subgrouped into mature (MT), immature (IT), and teratoma with malignant areas. These constitute 38% of tumors. Tumors of more than one histological type constitute 62% of neoplasms. We list all the components that are present and give a rough estimate of each. The classification recognizes syncytiotrophoblasts and intratubular malignant germ cells.

In England and some European countries the classification initially proposed by Collins & Pugh (2), and later modified by Pugh & Cameron (3) is used. This divides the tumors into seminoma, spermatocytic seminoma and teratoma. Teratoma is subclassified into teratoma differentiated; malignant teratoma intermediate; malignant teratoma undifferentiated; malignant teratoma trophoblastic and combined tumors. YST is recognized in infants and children but not in adults. Syncytiotrophoblasts and intratubular malignant germ cells are not recognized.

A number of tumor markers have been employed in the clinical and pathological management of germ cell tumors. These are alpha fetoprotein