CANCER OF THE TESTIS

Essay
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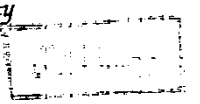

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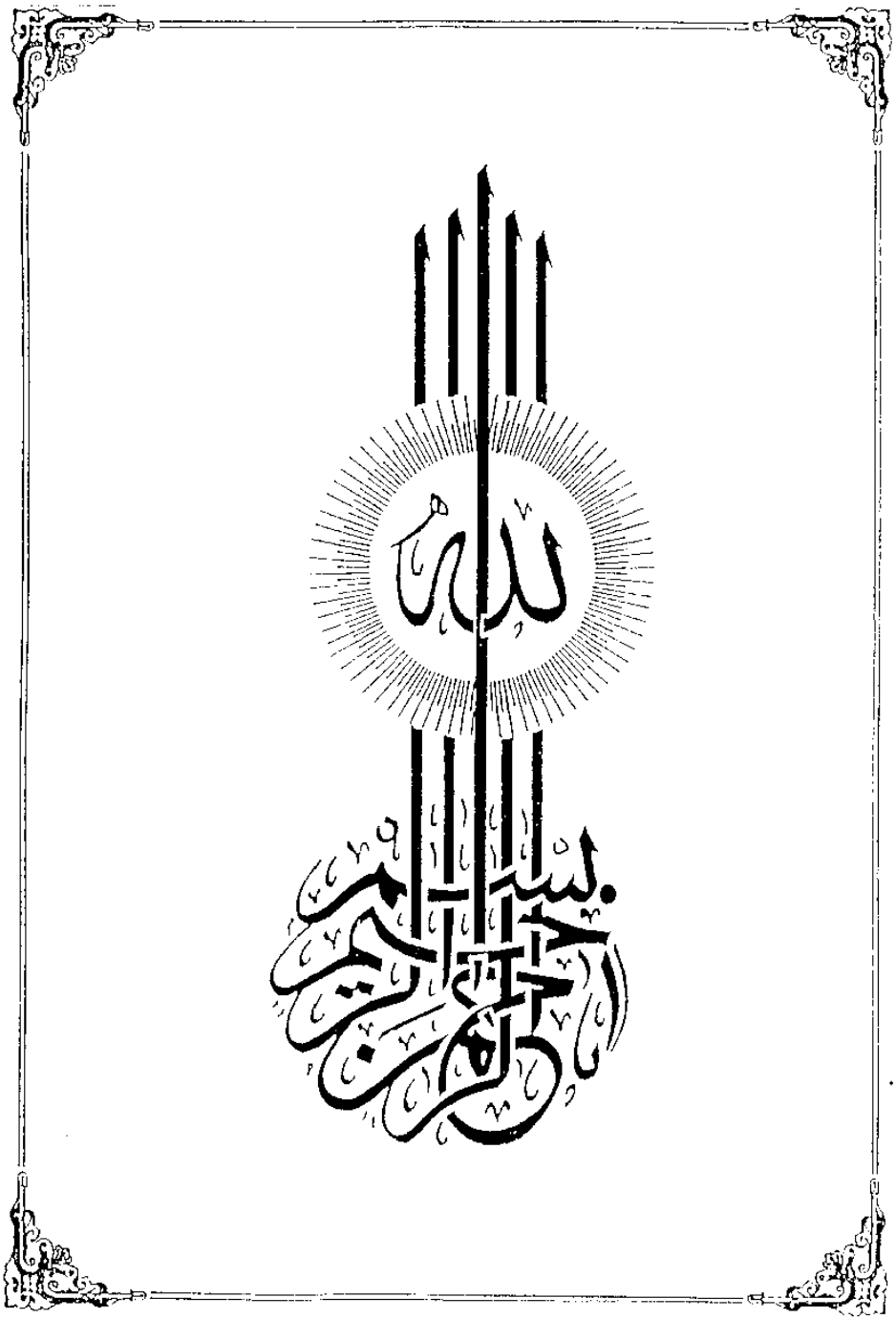
To The Spirit

of My Mother. . .



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CONTENTS

INTRODUCTION

Although testicular cancer is a relatively uncommon disease, accounting for only 1% of all male malignancy *(Rubin, 1970 and Drain, 1973)* it is important for several reasons.

Because testicular cancer is the most common carcinoma in the 15-35 years old age group *(Rubin, 1970; mostofi, 1973 and Brown, 1986)*, it has the potential for reducing productive years of life in this young patient population. Moreover, testicular cancer is one of the few neoplasms associated with accurate serum markers; human chorionic gonadotropin (HCG) and alpha fetoproteins (AFP).

In the past, testicular cancer was the most common cause of cancer death in young men.

The use of modern tumour markers proved to be accurate markers in testicular cancer, and together with combined modality therapy, have revolutionized the management of testicular cancer.

Also, because it is possible to resect the residual disease surgically *(Hardine, 1989; Schultz et al., 1989 and Bassoulet et al., 1990)* changing a partial remission to a surgical complete remission and curing the patient, thus making testicular cancer a model for a curable neoplasm in the vast majority of patients.

Aim of the work:

The aim of the work is to review what is recently published in literature as regards epidemiology, pathology and management of testicular cancer.

EMBRYOLOGY OF THE TESTIS

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The testis arises from the nephrogenic cord along the Mullerian duct, mesonephros and its duct. Microscopic study of the evolving genital ridge is seen in embryos of ovulation age (OA) 28 and 29 days. By OA 37 to 38 days, a gonad projects into the coelomic cavity as an elongated body. It gives no clue to indicate its future sexual differentiation. In the male, the cord like arrangement becomes more distinct, by OA 42 days*(Mostofi et al., 1987)*..

The testis is first recognizable as such when mesenchyme spreads beneath the surface epithelium and between the sex cords as the future tunica albuginea and its septa. Then by OA 48 days, the peripheral parts of the sex cords enlarge, split into daughter cords and form semin-iferous tubules. The regions between the cords are packed with cells. *(Mostofi et al., 1987)*.

By OA 55 days, the cells between the cords have increased greatly in number, some are enlarged and have distinct boundaries and are identifable as Leydig cells, which decrease in number and size after OA 60 days.

The primordial sex cells form spermatogonia and the supporting cord cells form the cells of Sertoli. The central parts of the sex cords converge and fuse to form the rete testes in fetuses of menstrual age 3.5 months. The rete connects with the glomerular ends of some six to twelve persisting mesonephric tubules which thus form the efferent ductules and lobules of the epididymis. In this way, the Wolffarin duct becomes the male genital duct and forms the duct of the epididymis, the ductus

deferens and near the Mullerian tubercle, the ejaculatory duct.*(Wendell et al., 1984).*

Descent of the testis:

Begining at the seventh week of intrauterine life, the primordium of the testis, the genital ridge, extends from the sixth thoracic to the second sacral segments. By the end of the second month, the gonads are elongated bodies which extend from the diaphragm to the site of future abdominal inguinal rings. Its cranial portion partly covers the adrenal gland and its caudal pole is attatched indirectly to the posterior abdominal wall by the urogenital mesentry. *(Williams et a., 1989).*

The whole column of the mesenchyme extending from the lower pole of the testis to the genital fold constitute the gubernaculum testis. When the pelvis grows, and the trunk of the foetus elongates, the gubernaculum does not grow in proportion, so that the testis being attached to the gubernaculum comes to lie in close proximity to inguinal region. This occurs till the third month *(Last, 1984).*

Meanwhile the cremaster muscle differentiates in the gubernacular mesenchyme of the inguinal region. A diverticulum from coelomic cavity extends into the mesenchyme called the processus vaginalis. From sixth month, the processus vaginalis grow into the mesenchyme of inguinal canal and scrotum and at the same time the cremasteric muscle extends downwards to the scrotum. The testis is still at the abdominal end of inguinal canal and reaches the scrotum by the end of the eighth month *(Lawrence et al., 1989).*

The lower portion of processus vaginalis persists as a tunica vaginalis but the upper pole usually obliterated at about the time of birth *(Romeanes et al., 1977).*

Descent of the testis may be delayed or arrested, in the latter case, spermatogenesis is usually incomplete and the organ is more than usually liable to malignant transfo-rmation *(Hausfeld et al., 1965 and Herr et al., 1973).*

ANATOMY OF THE TESTIS

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The testis, the primary male reproductive organ or gonad, is an oval organ, suspended in the scrotum by scrotal tissue including the non-striated dartos muscle and the spermatic cord. The left testis is usually about 1 cm lower than the right. Average testicular dimensions are 4-5 cm in length, 2.5 cm in breadth and 3 cm in anteroposterior diameter, their weight varies from 10.5-14 gm. Each testis, ellipsoidal and compressed laterally, is obliquely set in the scrotrum, its upper pole tilted anterolaterally and the lower pole posteromedially. The anterior aspect is convex, the posterior nearly straight, with the spermatic cord attached to it. Anterior, medial and lateral surfaces and both poles are convex, smooth and covered by the visceral layer of the serosal tunica vaginalis, which separates them from the parietal layer and the scrotal tissues external to this. The posterior aspect is only partly covered by tunica serosa, the epididymis adjoins its lateral part. At the upper pole of the testis, just inferior to the epididmal head, is a minute oval sessile cyst 2 or 3 mm in diameter called appendix of the testis, a remenant of the upper end of the paramesonephric duct (fig. 1)*(Williams et al., 1989).*

The testis is invested by three coats, from outside inwards, the tunica vaginalis, tunica albuginea and tunica vasculosa. The tunica vaginalis is the lower end of the peritoneal processus vaginalis. The tunica's proximal part, contracts and obliterates, thus forming the visceral and parietal layers of the tunica. The visceral layer covers all aspects of the testis except the posterior border. The parietal layer, reaches below the testis and is continuous with the germinal epithelium at the posterior aspect of the testis (Fig. 1). *(Williams et al., 1989).*

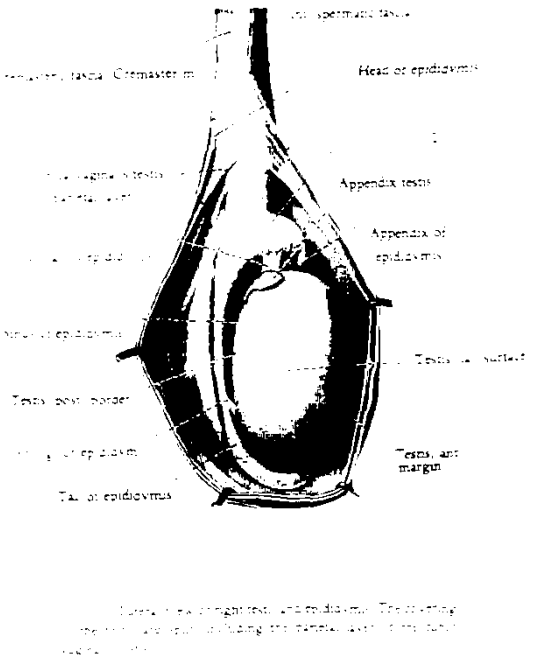

Fig.: (1) Lateral view of the right testis and epididymis. ***(Sobotta, 1978).***

The tunica albuginea is covered externally by the visceral layer of the tunica vaginalis, except at the epididymal head and tail and the posterior testicular aspect, where vessels and nerves enter the testis.The tunica vasculosa contains a plexus of blood vessels and delicate loose connective tissue, extending from the internal aspect of the tunica albuginea and covering the septa *(Williams et al., 1989).*

Internal structure of the testis:

At the surface is a layer of flat mesothelial cells. Internally, the testicular architecture is dominated by the lobules. Each contains one to three or more minute convoluted seminiferous tubules (Fig. 2). The semineferous epithelium consists of spermatogenic and supportive cells. The former when active, include an array of types from spermatogonia through their derived forms, spermatocytes and spermatids, to mature spermatozoa. *(Williams et al., 1989).*

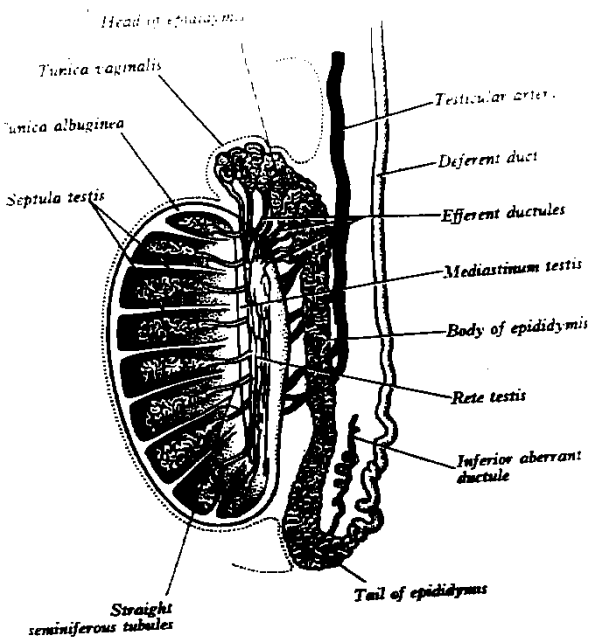

Fig. (2):Internal structure of the testis *(Williams et al.:, 1989)*