TESTICULAR FEMINIZATION SYNDROME:
A MODEL OF CHEMICAL INFORMATION NON-TRANSFER

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In 1950, Lawson Wilkins of Johns Hopkins Hospital reported a patient which he described as a "hairless women with testes" who failed to develop any signs of virilization on prolonged administration of large doses of testosterone and methyltestosterone. From this observation, he drew the inference that this syndrome might result from a "genetic end-organ unresponsiveness" to the action of testosterone and not to a deficiency of testosterone production. In 1953, Morris is credited with the definitive clinical description of the testicular feminization syndrome. Since that time, many other investigators have contributed to our understanding of the clinical and pathophysiologic features of the disorder. The clinical features of the syndrome of testicular feminization are summarized in Table 1.

Table 1
Clinical Features of Testicular Feminization

1) Female habitus, breast development, and body contour.
2) Scanty or absent axillary and pubic hair.
3) Female external genitalia with a blind ending vagina.
4) Undescended testes.
5) Testes have a high incidence of neoplasia.
6) Rudimentary male duct system, epididymis, and vasa.
7) Absence of a female duct system, uterus, and fallopian tubes.
8) Negative sex chromatin and 46/XY karyotype.
9) Unresponsiveness to virilizing and metabolic effects of testosterone.
Clinical Features

In the complete syndrome, body habitus, changes in contour, and breast development occur at the usual age of puberty and are characteristically normal for a woman. Menarche does not occur and pubic and axillary hair growth is scanty or absent. The external genitalia are normal for a woman but on examination, the vagina ends blindly and no cervix is seen. Rarely the vaginal canal is absent with only a superficial depression being present. The testes are undescended and usually are located in the labia majora, inguinal canals, or in the lower pelvis, but may be found as high as the inferior poles of the kidney. Half of such patients may have an associated inguinal hernia. The testes have been estimated by some authors to show as high as 30% incidence of neoplasia, particularly in older individuals. Interstitial cell and seminiferous tubule adenomata are not infrequently seen. Some of the tumors arising in these testes are malignant and are similar in type to those occurring in undescended testes of otherwise normal men. Histologically, the testes differ from the usual cryptorchid testes in having a smaller tubular diameter with decreased elastic and collagen fibers in the tubular walls and absent germinal elements. A rudimentary epididymis and vas deferens are usually present but end blindly within the pelvis and, consequently, cysts of these structures may be encountered. The uterus and fallopian tubes are absent.

Psychological orientation regarding gender identity and maternalism is essentially that of a normal woman. Many of these individuals have had successful marriages and have had normal female sexual responses.

The karyotype of the affected individuals is that of a 46/XY normal male. The familial nature of this order is well established but the precise form of inheritance is not clearly delineated. At the present time it seems that it is an X-linked disorder and which perhaps is reflected in mothers and sisters of the affected males as variable scantiness of their pubic and axillary hair, consistent with the variable expression of the mutant X-chromosome in these relatives.

Endocrine Features

From a classical endocrine standpoint, the affected individuals with this syndrome are near normal in that their secretion and metabolism of testosterone appears to conform to that of normal males. Slight modifications