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## INCIDENCE AND ETIOLOGY OF HYPOSPADIAS

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### Annotation

Hypospadias can be defined as incomplete virilization of the genital tubercle that causes an insufficient development of the tissues forming the ventral aspect of the penis. Three associated anomalies are classically found in the hypospadiac penis: an ectopic opening of the urethral meatus located at any place between the glans and the base of the penis, a ventral curvature of the penis (chordee), and a hooded foreskin with a marked excess of skin on the dorsum of the penis and a lack of skin on the ventrum.

**Keywords:** hypospadias, hormone, gonads, pseudo-hermaphroditism.

The incidence of hypospadias has increased over the past 15 years in Western countries. There is approximately 1 hypospadias for every 250 male births. The incidence is even higher if there is a family history of hypospadias (1 in 100 to 1 in 80 male births).

Four main protagonists might be involved in the male genital construction:

The child himself, with his gene bank, his endocrine machinery mainly represented by his gonads supervised by central hormonal control, and his target tissues with their protein platforms which may or may not respond to endocrine stimulation. The placenta, with its complex endocrine machinery, which orchestrates the hormonal climate, especially during the first part of gestation, and performs other functions not fully understood and evaluated. The mother, with her own hormonal production and its possible disorders that may affect the development of the child. The environment of the child and the mother, which may also interfere with this fine balance.

Disruptors and promoters may interact in this complex play in which many other unidentified agents may also have a role. The place of hypospadias on the palette of



disorders of sex development (DSD) is not completely clear. In the past, isolated hypospadias was distinguished from male pseudo-hermaphroditism. This separation is no longer valid, and it is likely that this congenital malformation belongs to a spectrum of errors in which endocrine disorders may have only a limited part. Very little is known about the “ground workers,” those molecular agents such as tissue proteins, growth factors, vascular factors, and tissue destructors (apoptosis), which need to be well balanced to establish an equilibrium between constructive and destructive factors.

In conclusion, all hypospadias cases are surgical challenges with a significant number of complications even in the best hands. Embryologically, hypospadias results from a failure of tubularization of the horizontal segment of the urogenital sinus, which occurs during the 11th week of gestation for the penile urethra and during the 4th month of gestation for the glanular urethra.

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