SURGICAL MANAGEMENT OF EPISPADIAS

Essay

Submitted for partial Fulfilment of the master degree of

General Surgery" M.Sc"

By

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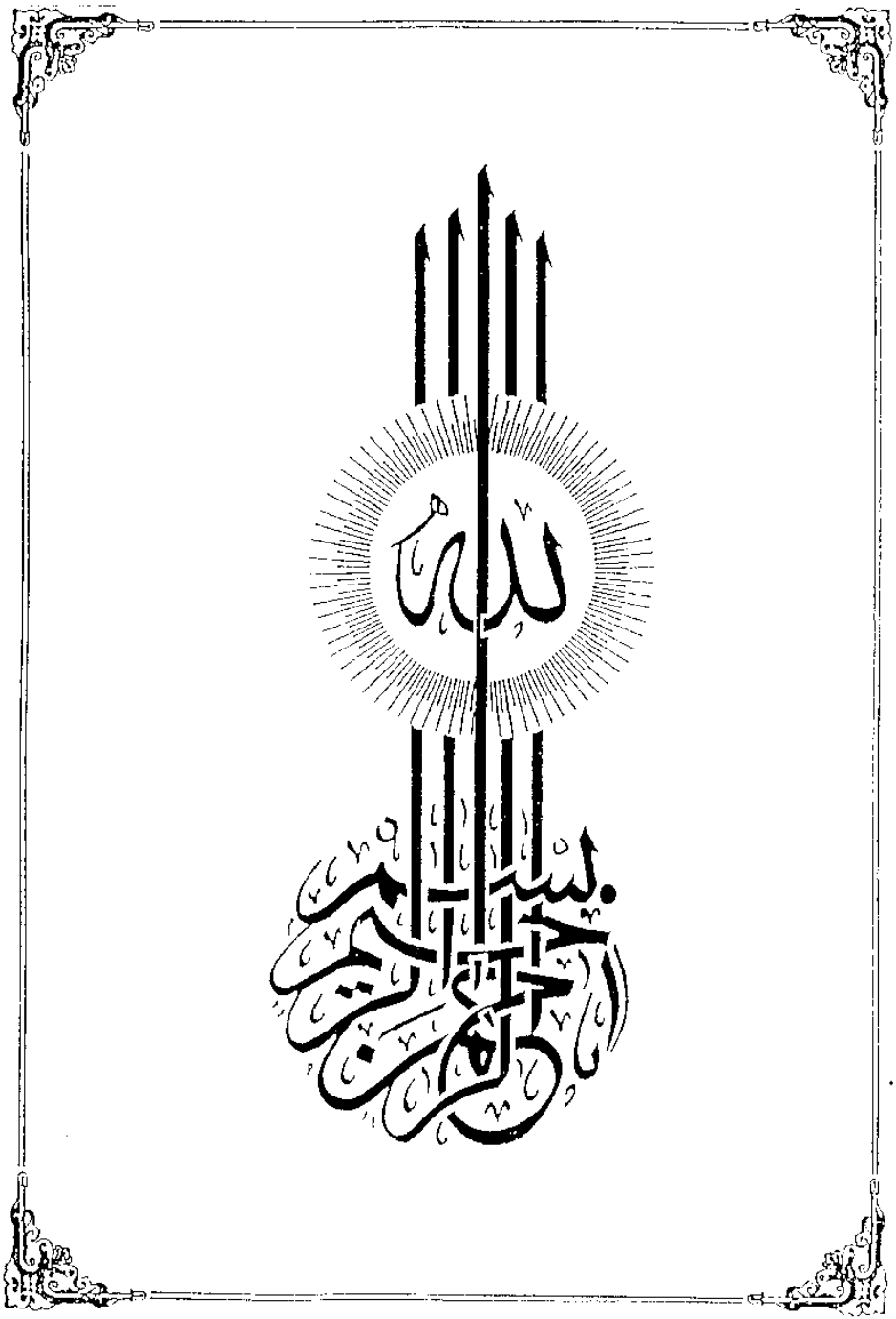

بِسْمِ اللهِ الرَّحْمٰنِ الرَّحِيمِ

وَقُلْ رَبِّ زِدْنِي عِلْماً

صَدَقَ اللهُ الْعَظِيمْ

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Embryology

Embryology

At approximately 2 weeks of gestation the **cloaca** *appears, having been formed by the junction of the ventrally outgrowing allantois and the hindgut* **"Fig. 1a".** *Cloaca is separated from the exterior by the cloacal membrane. The urorectal septum becomes apparent in the angle between the allantois and the hindgut dividing the cloaca into a smaller dorsal part, the primitive rectum, and a larger ventral part the primitive urogenital sinus into which the allantois and the mesonephric ducts open. The level of entry of the mesonephric ducts into the primitive urogenital sinus marks the division of the latter into vesico-urethral canal and the urogenital sinus proper. It is only the former, which is continuous with the allantois that is concerned in the development of the bladder,* **"Fig. 1b".** *The mucosa of the bladder arises from the endodermal lining of the vesico-urethral canal, and the vesical musculature is derived from its splanchnopleuric mesoderm. It is widely occepted that the tissue in the dorsal wall of the developing bladder and primitive urethra between the orifices of the ureters and mesonephric ducts is of mesodermal origin. As development proceeds the vesico-urethral canal shows a subdivision into a dilated upper portion, the bladder, and a relatively narrow lower part, the primitive urethra. In latter development the primitive urethra in the female forms most of the definitive urethra. In the male however it forms only that part of the definitive uretha "Prostatic urethra" extending from the internal urethral orifice to the entrance of the common ejaculatory ducts. The remaining part of the prostatic*

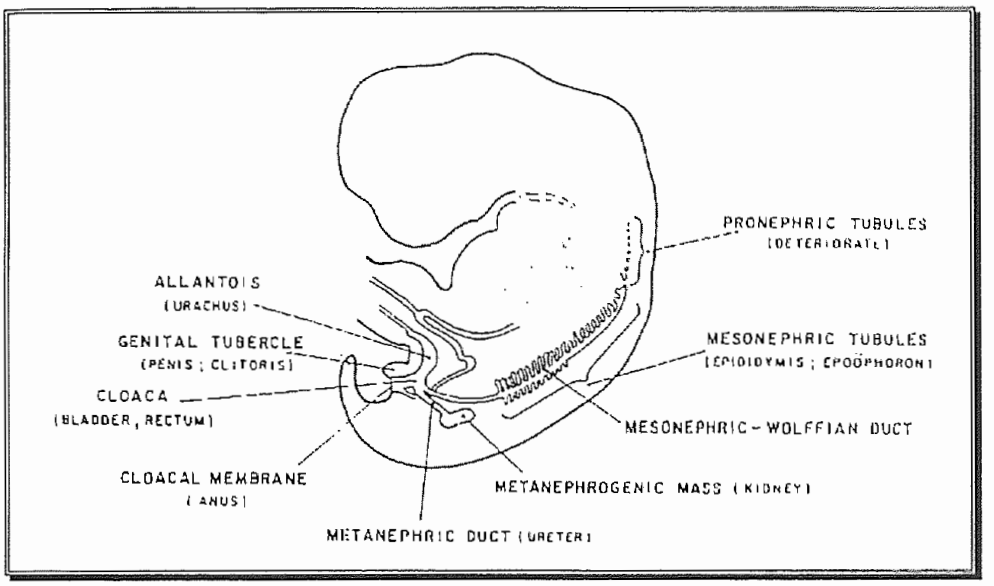

Fig. (1a) The normal human embryo between the fourth and sixth weeks of fetal life. Although the genital tubercule has made its appearance and is identifiable, the genitalia of the two sexes are identical at this stage of development.

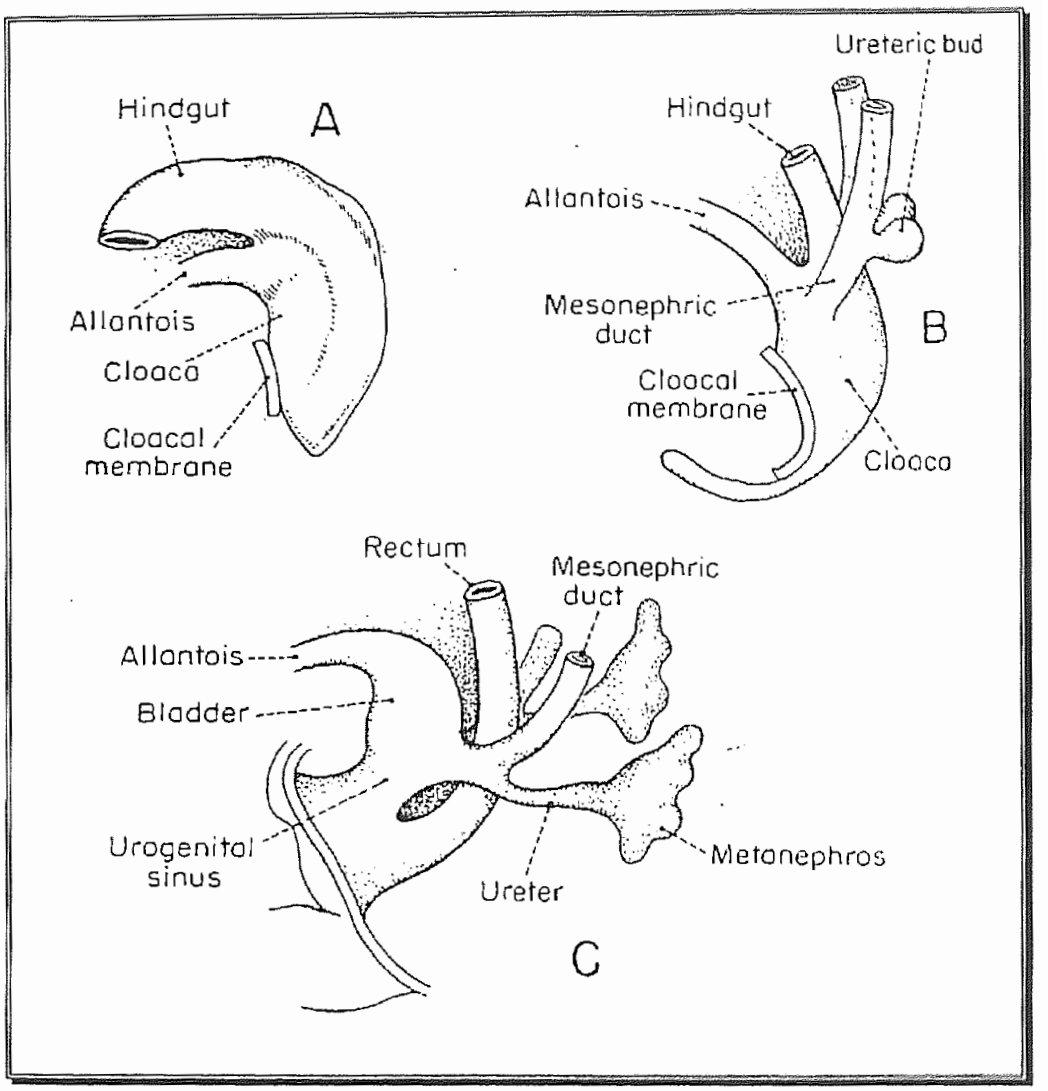

Fig. (2b) Embryogenesis of the cloaca. Division by the urorectal septum forms the bladder ventrally and the rectum dorsally.

urethra as well as the membranous urethra arises from the pelvic part of the urogenital sinus. The phallic part of the urogenital sinus gives rise to most of penile urethra. The terminal part of the penile urethra is ectodermal. **"Hamilton et al 1978".**

Anomalies of the urethra.

Urethral duplications:

They may or may not communicate with the bladder and the normal urethra. Congenital urethral diverticula are the mildest representation of this malformation. The embryogenic origin of this anomaly is defective closure of the penis and formation of the raphe during the 10 th to the 14 th week.

Hypospadias:

Hypospadias is a congenital defect in which the urethra opens abnormally in the ventral aspect of the penis, penoscrotal junction, or the perineum. According to the location of the hypospadias, it is classified as glandular, penile, penoscrotal or perineal **"Fig 1c".** *The embryogenesis of this malformation can be summarized as a failure of formation of the distal urethral folds. The absent corpus spongiosum distal to the urethral opening is replaced by fibrous bands of tissue that form the chordae.*

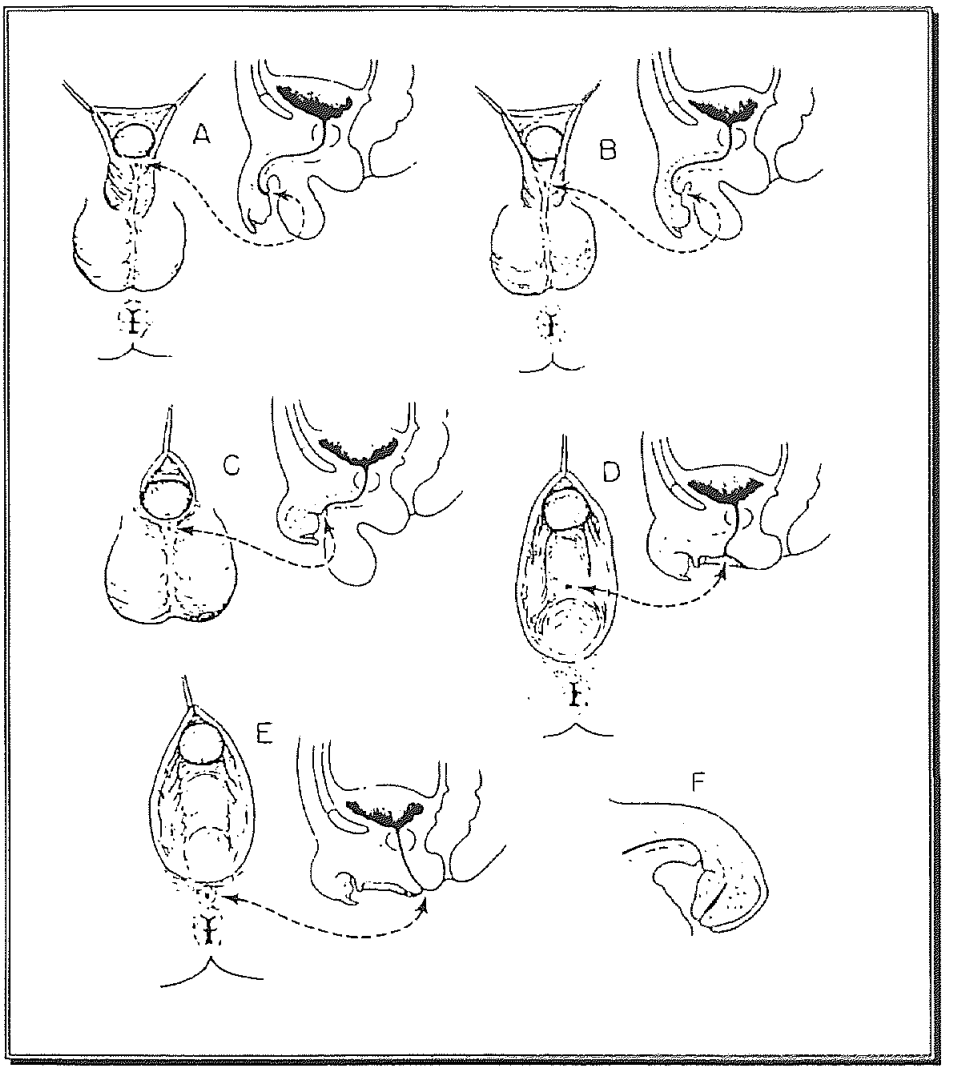

Fig. (1c) Hypospadias. A, Glandular; B, Penile; C, Penoscrotal; D and E, Perineal. Note undescended testes. F, Penile hypospadias with a well-developed glandular urethra.

Epispadias and Exstrophy of the bladder:

Epispadias and exstrophy represent failure of the ventral infraumblical wall to fuse in the midline, involving the urethra and the genital tubercle "Epispadias", the pubis and the anterior bladder wall "exstrophy". Three degrees of epispadias "glandular, penile or complete" are recognized depending on the length of the absent urethral roof, **"Fig 1d"**. *Exstrophy of the bladder includes complete epispadias, diastasis of the pubic symphysis associated with exposure, and protrusion of the bladder. The ureteral arifices and the trigone are visible* **"Manuel 1978"**.

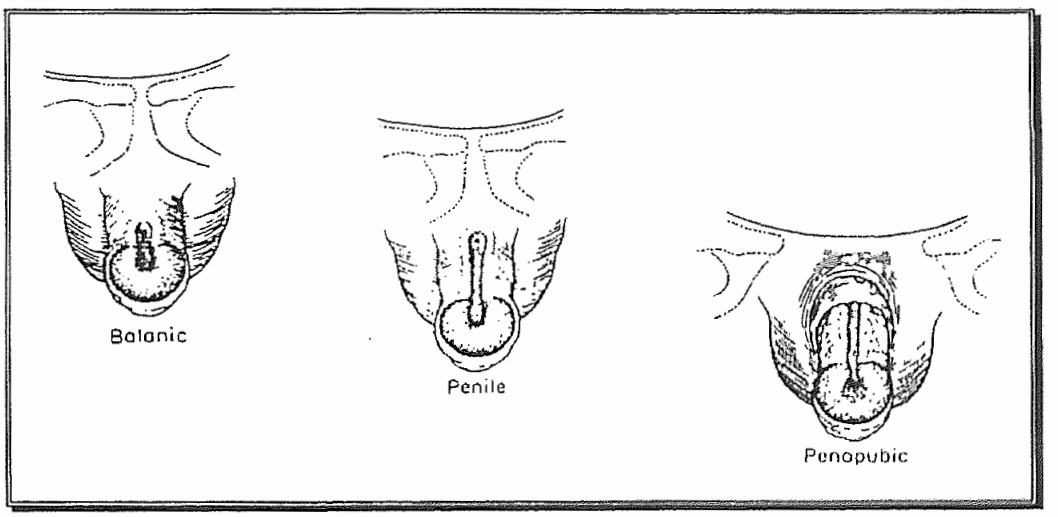

Fig. (1d) Epispadias.

Embryogenesis of Epispadias and Exstrophy:

Embryologically, epispadias is the result of an unusual ventral prolongation of the cloacal membrane beyond the phallic primordium. As a result, the urethra forms from the penopubic angle above the corpora cavernosa **"Manuel 1978" "Fig 1e".**

Epispadias represents not an arrest of normal development, but an abnormal embryonic event. The normal embryo does not pass through a phase in which the amniotic cavity and the cloaca communicate **"Johnston and Kogar 1974"**. *Abnormal persistence of the cloacal membrane cephalad to the genital tubercles produces an unstable fusion of endoderm and ectoderm. Elsewhere in the body, such as the oral cavity and nasal choanae, this combination of endoderm and ectoderm is unstable and disintegrates. Rupture of this portion of the membrane results in the abnormal communication between the urogenital portion of the cloaca and the amniotic cavity* **"Fig. 1e".** *Two theories exist to explain the persistent cloacal membrane cephalad to the genital tubercles.* **Patten and Barry "1952"** *theorize that the paired genital tubercles are displaced caudally. Subsequent fusion of the tubercles would then isolate a portion of the cloacal membrane cephalad to the tubercles.* **Marshall and Muecke "1962 & 1964"** *theorize that an abnormal overdevelopment and cephalic extension of the cloacal membrane prevents the paired genital tubercles from fusing in the midline on the cephalic rim of the cloacal membrane. The paired genital tubercles*