The word Prepuce originally came from the old French word “prepuce”, and from Latin “praeputium”, which means “prae-“before and “putos” means “penis”, but in Greeks language the word prepuce composed of two distinct structures: the posthe (ποσθη) and the akroposthion (ακροπσθτυου). Posthe referred to that part of the prepuce that covers the glans penis, and “Akroposthion” designates the tapered, tubular, visually defining portion of the prepuce that extends beyond the glans and terminates at the preputial orifice.

Anatomically the prepuce or foreskin is a double-layered fold of smooth muscle tissue, blood vessels, neurones, skin, and mucous membrane that covers and protects the glans penis and urinary meatus when the penis is not erect. The embryonically homologous of prepuce in female is the clitoral hood. The World Health Organization debates the precise functions of the foreskin, which may include; keeping the glans moist, protecting the developing penis in utero, or enhancing sexual pleasure due to the presence of nerve receptors. A lot of debate emerge in literature and researches work about the importance and significance of prepuce, and usually the idea behind this argument is to fight against or with the removal of this skin piece during circumcision [1].

**Embryology of prepuce** Bokai (1860) was the first to direct attention to the physiological adherence of the foreskin. Schweiger and Seidel (1866) gave the first description of the development of the prepuce in the human, but Retterer (1885–1915) was the first to describe development of the prepuce, which start to develop in the 57 mm human fetus (8 weeks of gestation) from the base of the glans, as a preputial fold which has been raised round the dorsum and sides of the base of the glans, but it is interrupted along the under surface by the urogenital ostium (the future urethra), before that time the glans penis was completely uncovered and splitted with the urethral plate at its depth (Fig. 1). In the 65 mm fetus (fourth month of intra-uterine life) the urogenital ostium is confined to the under surface of the glans and the preputial fold has rolled over the base of the glans except in the region of the urogenital ostium where it is deficient at that stage, with the further distal development of the glandular urethra and closure of its edges, the perpetual
fold close ventrally to form the frenulum (which is attached to the undersurface of the glans) at the inner mucosal aspect and preputial raphe at the outer surface, with the dorsal portion growing at a more rapid rate than the ventral component, this fold covers the glans progressively, and the epithelium covering the deep aspect of the fold fusing with the epithelium covering the glans. The closure of the ventral portion of the prepuce is completed by the fifth month of gestation after the closure of the glandular urethra, in relation to the distal part of the glans the lower margins of the lamella fuse to form a complete epithelial cuff which, by breaking down, gives rise to the cylindrical terminal part of the prepuce (Fig. 2). Phimosis could be explained in terms of the preputial fold continuing to grow forward too far beyond the tip of the glans and failure of the glandular lamella to disintegrate.

![Fig. 1](Intrauterine male genitalia of 65 mm embryo, with the glans uncovered by prepuce, which start to creep from the coronal sulcus)

![Fig. 2](External genitalia of a 70 mm human fetus with incompletely developed glandular urethra and prepuce)
It is generally accepted that normal preputial development is required for successful canalization of the glandular urethra, so the absence of the prepuce would result in an abnormal development of the glandular urethra, and to be manifested as a hypospadias with a usual hooded prepuce, as Hunter (1935) [2] pointed out. It is also proved that the proper development of the prepuce depends on the presence of androgen and androgen receptors.

Observations made on female embryo lead to the conclusion that the same processes are involved in the formation of the clitorial prepuce, but persistence of the urethral groove in female and hypospadiac penis prevents the fusion of the margins of the preputial fold and of the glandar lamella. This again emphasises the close association of the preputial anlage with the urethral folds, this association explains the presence of a hood-like prepuce in cases of hypospadias. The only non explainable exception of this concept is the intact prepuce megameatus anomaly and the very rare cases of epispadias with intact prepuce (chap 21&26); where the prepuce developed completely to the tip of the glans, but the underneath glandular urethra is still not completed.

In children, the foreskin usually covers the glans completely but in adults it may not, in a study of 3,000 young men from Germany there is only 49.6% had the glans fully covered by foreskin, 41.9% were partially covered and 8.5% were uncovered; around half of which (4%) had the foreskin atrophied spontaneously without previous surgery [3]. The length of the prepuce in the human population varies from large problematic to a very small (unable to circumcise) or absent prepuce i.e., aposthia. Radojici and Perovic found 6 various morphological forms of the prepuce associated with hypospadias, indicating its quantitative nature—“monk’s hood”, “cobra eyes”, “normal” (intact), “flat”, “v-shaped” and “collar-scarf”. This variation in shape and size of the prepuce in the population suggests that it may be a dominant quantitative trait [4].

Almost all mammal penises have foreskins which called the preputial sheath or penile sheath into which the whole penis is retracted. Only monotremes (the platypus and the echidna) lack foreskins. Several congenital external genital anomalies related to the prepuce have been documented, however, natural circumcision or aposthia (the absence of the prepuce) with a normal development of the urethra is very rare.

Preputial glands are exocrine glands that are located in the folds of skin in front of the genitals of some mammals (including mice) and produce pheromones. The preputial glands of female animals are sometimes called clitoral glands. The preputial glands of male musk deer produce strong-smelling deer musk which is of economic importance, as it is used in perfumes.

There is debate about whether humans have functional homologues to preputial glands, which were first noted by Edward Tyson and in 1694 and fully described by William Cowper who named them Tyson’s glands. They are described as a modified sebaceous glands located around the corona and inner surface of the prepuce of the human penis. They are believed to be most frequently found in the balanopreputial sulcus. Their secretion may be one of the components of smegma, but some, authors dispute their existence [4]. While humans may not have true anatomical equivalents, the term may
sometimes be used for tiny whitish yellow pimples occasionally found on the corona of the glans penis. The proper name for these structures is pearly penile papules (or hirsutoid papillomas). According to detractors, they are not glands, but mere thickenings of the skin and are not involved in the formation of smegma [5].

Smegma is a natural secretion of skin cells and oils that collects under the foreskin in both males and females, it is firstly seen in the enlarged posterior extremity of the glandar lamella, the future coronal sulcus in adult, approximately at sixth month of foetal life. If allowed to grow stale, it may have a pungent aroma (commonly compared to cheese in males or fish in females), and has lubricant, pheromonal (sexual attractant), and perhaps bacteriostatic functions. The quantity of smegma varies, but it is comparable to earwax. This natural emollient also contains prostatic and seminal secretions, desquamated epithelial cells, and the mucin content of the urethral glands of Littre. It protects and lubricates the glans and inner lamella of the prepuce, facilitating erection, preputial eversion, and penetration during sexual intercourse. In one survey, out of 18 self-selected intact men never saw smegma; 1 saw it after a week unwashed, 6 after 2 days, 8 after 1 day, and 1 after less than a day [6].

Congenital anomalies of the prepuce include complete absence, deficient or extensively large prepuce; aposthia, microposthia or macroposthia respectively.

References