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Infrequent congenital malformation in male rabbits: hypospadias of the penis

Michel Gruaz[1], Arie van Praag[1] and Esther van Praag[2]

1 Illustrative contributions, 2 author

The development of the male genital tract during the embryonal phase is complex. It includes activation of specific genes involved in the production and secretion of testosterone, enzymatic activities, cell differentiation with restructuration of tissues.

When a gene is deficient or mutated, or when some external factor influences this process, development and specialization of tissues is impaired, e.g., the formation of the urethra in the penis and the ventral foreskin may be deficient and halted.

Hypospadias is an infrequent congenital disease, caused by the incomplete fusion of the urethral folds present in the embryo's penis.

The incomplete development of the urethra duct - leading the urine from the bladder to the outside, in the penis leads to a transposition of the urinary orifice (urinary meatus) from the tip of this organ towards its base, closer to the body. The further this orifice is located from the tip of the penis, the more severe the abnormality will be and the more likely the rabbit will be infertile and will suffer from more malformations associated to hypospadias.

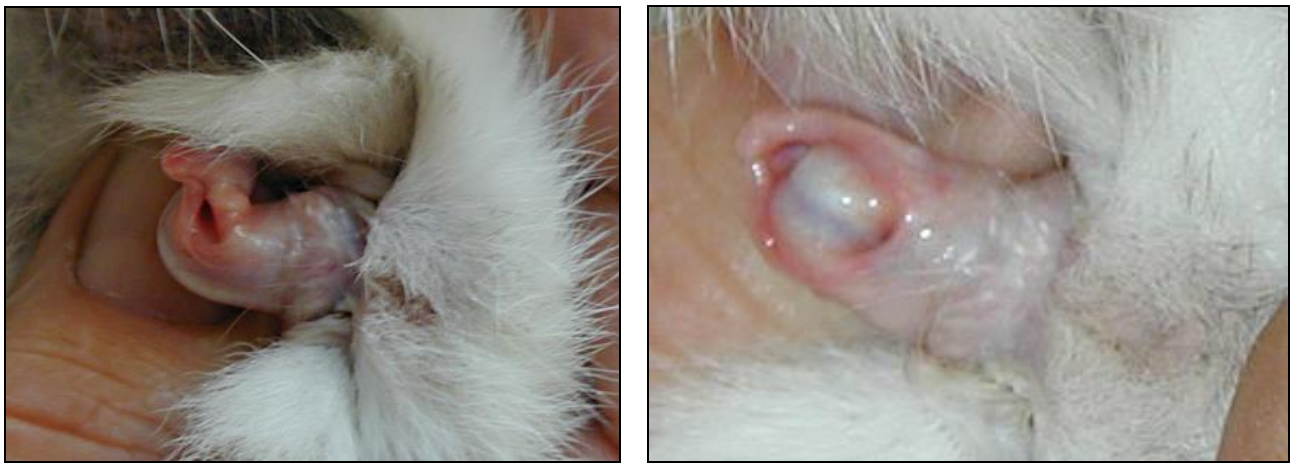

Figure 1: Hypospadias occurs differently according to the type. Here the urinary orifice (urinary meatus) is located near the end of the penis and the foreskin is absent on the underside of the penis. Curvature of the penis is minimal.

Figure 2: Rabbit suffering from a more severe hypospadias. His reproductive anatomy resembled that of a female rabbit when young (top). Once adult, the orifice moved towards the middle of his short and curved penis (down). Only one testis descended into the scrotum. It is visible right above the penis.

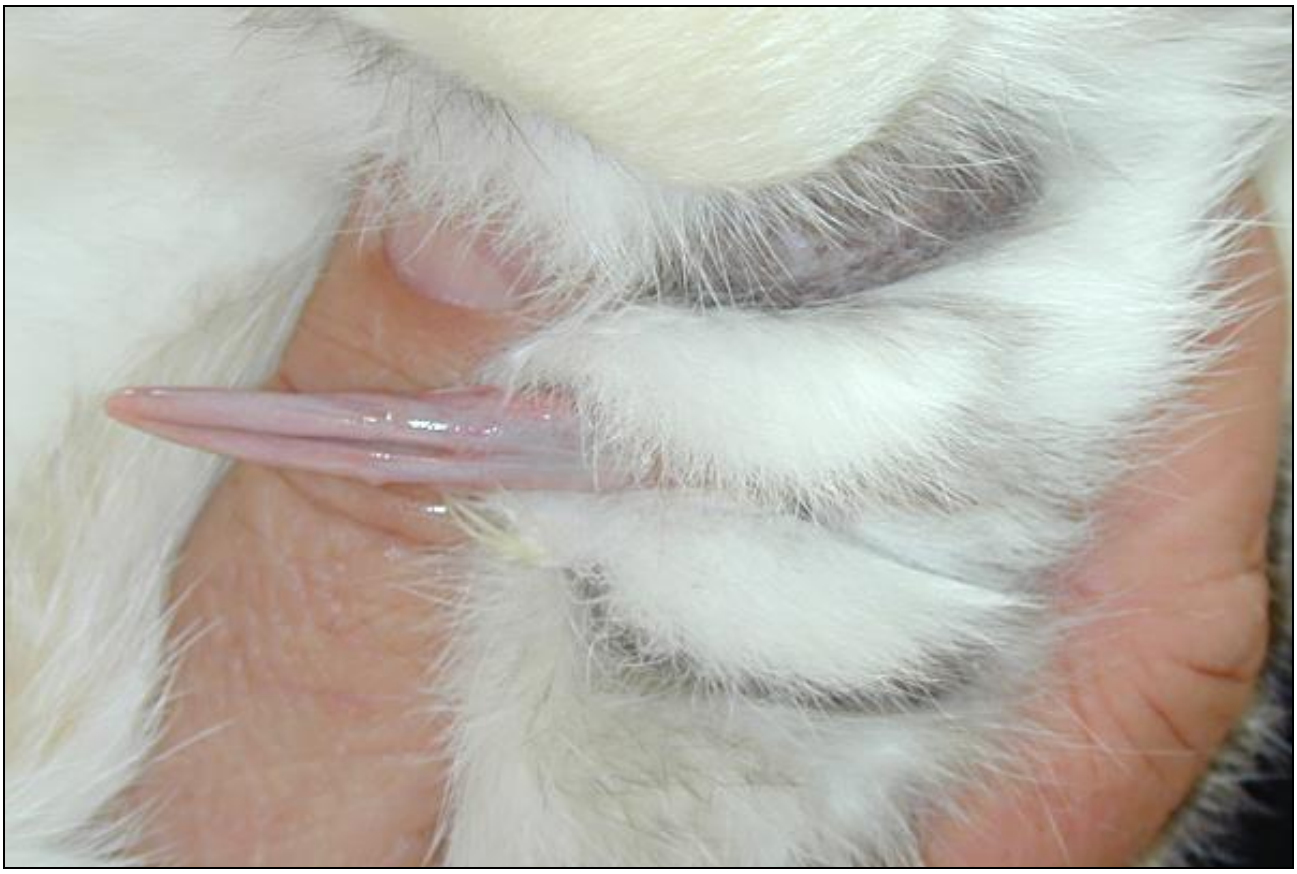

Figure 3: The anomaly can also be a split over the full length of the penis.

If this condition is accompanied by an abnormal curvature of the penis, mating with a female becomes very difficult, if not impossible

Types of penile hypospadias

Different types of hypospadias have been observed in rabbits, depending on the location of the problem:

- Anterior type: an abnormal meatus located at the distal end of the penis. This deformation is the least severe and causes little harm to the animal. If the anomaly is mild, and is located near the tip of the reproductive organ, males can mate and reproduce almost normally (Figure 1).
- Medium type: the meatus is located in the middle of the ventral side of the penis. (Figure 2). This type of deformation is considered moderately severe.
- Posterior type: the urinary meatus is located at the base of the penis or in the perineal region. A ventral curvature of the penis beyond the urinary meatus is frequently seen. Testes are small or may be absent. This type of deformation is considered severe. Rabbits affected by perineal hypospadias may present a sexual ambiguity, which is why this type is also called pseudohermaphrodism.

More rarely, fusion of the urethral folds does not occur during the genesis of the embryo. In this case, the urinary meatus is observed as an opening along the entire length of the penis (Figure 3). Rabbits suffering from this problem may breed, but the fertility rate is reduced because sperm

will spread along the whole split, and not anymore at the tip of the glans.

Rabbits suffering from hypospadias have problems with urination. The stream of urine is often deviated and soils fur and skin, which is characterized by the appearance of regions devoid of hair and skin irritation in the perineum or the lower limbs. Adults are usually unable to mate.

Causes and consequences

The etiology of a hypospadic penis remains unknown. Although hypospadias appears sporadically, exposure to certain environmental factors influencing the endocrine system and secretion of hormones is suspected. When the malformation affects a rabbit lineage, a hereditary genetic origin with a recessive transmission is considered.

No information is available about malformations associated with hypospadias in rabbits. In other animals, their frequency increases with the severity of hypospadias. The most common are retention of one or both testes in the abdominal cavity (cryptorchidism), accumulation of serous fluid in the tunica of testicles, kidney malformations, or inguinal hernia. This type of hernia develops at the level of the inguinal canal, where the spermatic duct and the blood vessels of the testes leave the abdominal cavity into the scrotum. Muscle weakness within the abdominal tissue causes the formation of a pocket. A loop of the intestine or the bladder can descend into this pocket at respectively the groin or scrotum level. To date, there is no treatment for this malformation in rabbits. To date, there is no treatment for this malformation in rabbits. The rabbit may have a normal life, but not as buck, to avoid the transmission of this defect to its descendants. It may, however, become a perfect pet rabbit after castration.

References

Baskin LS, Ebbers MB. Hypospadias: anatomy, etiology, and technique. J Pediatr Surg. 2006;41(3):463-72.

Higuchi TT, Palmer JS, Gray LE Jr, Veeramachaneni DN. Effects of dibutyl phthalate in male rabbits following in utero, adolescent, or postpubertal exposure. Toxicol Sci. 2003;72(2):301-13.

Meyer J. Genetische Defekte und züchterische Auslese. KaninchenZeitung. http://www.kaninchenzeitung.de/?redid=352569&seite=0 11.05.2011.