

# Cryptorchidism in the Horse

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THE emasculation of various members of the animal kingdom to suit the convenience and needs of mankind has been practiced for unknown centuries. Egyptians, Phoenicians, Greeks, Romans and the ancient Jews possessed this knowledge and Moses spoke of it in the Bible—Leviticus, Chapt. XXII, Verse 24.

Aristotle writes of castration in man and quadrupeds, both male and female, as well as birds, and gives an outline of its effects on the subject operated on. Pliny writes of the advantages of castrating both male and female camels for war and Magon, a Carthaginian, spoke two centuries before Christ of castrating with plates of wood — the first reference to a mechanical emasculator.

During the dark and middle ages little was written and knowledge of the subject was dissipated. It is recorded however, that in the seventeenth century the Danes castrated ewes, sows, cows and mares by entering the left flank. So common was this practice that in 1717 a law was passed in France forbidding the operation on mares.

Crushing, direct excision, the ecraseur, torsion, etc., are all written of by the ancients, and today the Lapland reindeer are castrated by the old women crushing the cords with their teeth — a method that has no history but time itself.

Despite these voluminous writings on emasculation prior to 1881 there appeared no reference in the literature of the “rig” or cryptorchid. That this anomaly was present in livestock during this period is undoubted, but possibly due to its comparative infrequency and lack of corrective measures, no one had written or even attempted an operation to correct this condition.

## **Embryological Development of a Cryptorchid**

The cryptorchid, “rig,” ridgling, toruno, stag, etc., is a male whose development is abnormal in that either one or both of the testes are retained in the inguinal canal or abdominal cavity instead of descending into the scrotum. This most disliked of all farm animals, regardless of species, is the result of an anomaly which has occurred prior to birth. During embryological development the genital ridge rises on the mesial ventral surface of the Wolffian body. The gubernaculum testes proliferate at this time, the anterior end having its attachment to the epididymis, the posterior portion being adherent to the front of the pubis, the root of the penis, with a goodly number of fibers ending in the posterior portion of the scrotum itself, attached to the dartos muscle. As the foetus enlarges the gubernaculum either atrophies or ceases to grow and pulls the testis down into the scrotal sac, or acts as a guide for its descent. If, for any reason, this descent into the scrotum fails to occur, then the testis remains

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in the inguinal canal or in the abdominal cavity and a cryptorchid is the result.

### Literature

Fleming (5) writes in 1881 of an American farmer named Miles who had visited England in 1879, taught the English veterinarians a method of successfully castrating cryptorchids, and left with no regret on either side. References to his "charlatan" behaviour by the author are as amusing as they are indignant. Apparently the enterprising New Englander, realizing his knowledge was not available in the British Isles, would teach his techniques only after payment of rather substantial sums of money.

Articles had been written from 1838 to 1865 in various European journals on the cryptorchid horse, but operations on these individuals were evidently restricted to the country "castrators" of the era. Fleming states that there is strong evidence that the anomaly is hereditary in nature, the progeny of certain "rig" stallions being similarly affected. His description of operative procedures of the day vary little from modern technique, either for abdominal or inguinal cryptorchids.

Crew (2) made a histological study of the undescended testes of 15 cryptorchids, 14 of which were unilateral, 1 bilateral. In the five inguinal testes described he reports that the seminiferous tubules were small in number, the connective tissue stroma greater in amount than normal. There were normal amounts of primary spermatocytes in the tubules but no viable sperm, only debris of a fatty nature. Of the nine abdominal testes examined, tubules were nearly lacking and hyperplasia of the connective tissue more distinct. Four were cystic in nature and had deposits of lipochrome in the cystic sections, and in two, actual deposits of hyaline cartilage were noted.

Crew postulates that cryptorchidism is the result of an anatomical imperfection of development, or disease.

Lush and Jones (7) have sought to determine the incidence of this anatomical aberration. They found that cryptorchidism is most frequent in swine, perhaps

being as high as 2 percent of all male births. Horses are the next most frequently affected, (perhaps 1 percent), but it is rarely found in cattle, and is still more rare in sheep. It is, however, rather plentiful in Angora goats, while in man the incidence is approximately 0.25 percent.

### Hereditary?

Lush and Jones (7) report the results of an experiment conducted in Angora goats at a Texas Experimental Station. A small flock of does was mated to a ridgling sire and in three years had produced no more ridglings than the ordinary herd. At the end of three years another buck was used and in the succeeding nine years three bucks were found which transmitted the defect to their sons, and their daughters' sons. Of the bucks used, three were found that sired more than 50 percent ridgling sons, four that did not transmit it to sons or grandsons, and three which probably did so.

Schaper (11) reports the case of a German mare who had 12 foals, 10 males and 2 females. Of these 10 males 7 were cryptorchids, an extremely high incidence in the progeny of a single animal.

Lush and Jones (7) point out that some cases of cryptorchidism are not purely hereditary, but that other cases can be explained on the basis of two independent Mendelian factor pairs, the cryptorchid being homozygous for both recessive pairs.

Oslund (9) reports that, although the cryptorchid is sterile, the hormone producing ability of the abnormal testis is not impaired and may even be accentuated, accounting for the excessive sexual activity of the cryptorchid horse and for his uncertain and often dangerous disposition.

Cryptorchidism then is no new phenomenon, but until relatively recent years has not been subject to surgical treatment. In those cases that are hereditary it is probably due to two pairs of Mendelian factors, the cryptorchid being homozygous for both recessive factor pairs. Lush recommends that, as far as possible, no cryptorchid be used as a sire, regardless

of species, and any female that has given birth to such an individual should be discarded from the breeding herds. Modern surgical techniques in most cases can remove the retained testis, but one should expect to find almost any anatomical abnormality in the abdominally retained testis of a horse of two years of age or better. If the testis is manipulated into the scrotal sac and is retained there it most often assumes normal semen production. Recent research has shown that treatment with gonadotropin hormone may well cause descent of the retained testis and if this is not accomplished it at least causes enlargement of the spermatic cord, testis and related structures, facilitating surgical procedures if the latter is required.

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In 1948 the prepared dog food business, in dollar volume, amounted to about 25 percent of the total grocery store coffee business, and equalled the total ready-to-eat breakfast business.

A Dutch chemist, Mulder, coined the term protein in 1838. He derived it from a Greek verb meaning "to take the first place."

The saddle horse population in the United States is now around 850,000 with 500,000 of these used for work in the western states.

Carnation's Ormsby Madcap Fayne produced 41,943 pounds of milk, and 1,392 pounds of butterfat in 365 days.

The boar is the principal spreader of swine brucellosis, and is responsible for all "storms" of the disease.

Wholesale vaccination of chickens against Newcastle disease by an airborne method and a new improved vaccine have been developed at the School of Veterinary Medicine, University of California. The new method atomizes the vaccine into the air in an enclosed pen or chamber, and the birds inhale it. The vaccine is a tissue culture which cannot produce the active disease in poultry, but does provide immunity. *Country Gentleman* Dec. 1950.

At George Washington University at Washington, D. C., doctors took ten patients with cancers considered too hopeless for surgery or X-ray treatments, and injected nitrogen mustards into the arteries carrying blood to the malignant tumors. In each case, they reported, the chemical slowed the cancer growth "remarkably." *Coronet*, Dec. 1950.