Theriogenology Question of the Month

This feature is sponsored by the American College of Theriogenologists. Readers of the JAVMA are invited to submit contributions. Contributions should provide a learning exercise about theriogenology. A specific question should be posed for the readers. The author's answer to the question and a brief discussion should be presented. Possible topics include commonly seen problems in domestic or exotic animals. Herd problems in dairy and beef cattle, sheep, goats, horses, and exotic hoofstock, problems in kennels or catteries, or flock problems in domestic and exotic fowl also are appropriate. Please contact Dr. Craig A. Smith, Associate Editor (800/248-2862, ext 259, or FAX 847/925-1329), for further details.

History
An 8-month-old male ferret (*Mustela putorius furo*) was examined in April 1998, because it had only a single testis within the scrotum. The ferret had been purchased the previous October as an 8-week-old kit from a local retail pet store; it had been sold as a neutered animal that also was descented. Results of physical examination were not remarkable except for the large head and torso size characteristic of sexually intact male ferrets. The anal glands had been removed as evidenced by 2 scars in the anal region and an inability to palpate intact glands or express musk. Although a scar was not evident on the scrotum or inguinal area, it was presumed that the contralateral testis had been removed at the time of extirpation of the anal glands. The owner declined the use of diagnostic testing or exploratory celiotomy, which could have been used to verify that an undescended testis did not remain in the ferret's abdomen.

Question
What is the most likely cause for the monorchid condition in this ferret? Please turn the page.
Answer

The ferret probably had a cryptorchid testis at the time of anal gland extirpation and unilateral orchiectomy; that testis subsequently descended after the time of the surgery to create the monorchid condition.

Discussion

Because of the history of prior surgery, it was presumed that the ferret was cryptorchid at the time of castration and removal of the anal glands and that the scrotal testis evident during physical examination had descended when the ferret reached sexual maturity. Ferrets typically are born in the spring, and the testes descend into the scrotum during the period from December through July, coinciding with testicular development and onset of sexual activity. The testes typically descend into the scrotum during fetal development, but complete descent may be delayed for several months after birth.

Most ferrets sold by commercial breeders are neutered and descended at approximately 6 weeks of age by members of their staff or by veterinarians contracted to perform surgery; these surgeries are performed prior to sale to pet stores. Private breeders typically sell sexually intact ferrets, which the subsequent owners generally have neutered when the ferrets reach 6 months old. Testes have a greater likelihood of being completely descended in 6-month-old ferrets, compared with ferrets that are only 6 weeks old.

Cryptorchid testes may be found in the abdominal cavity or inguinal canal or beneath the skin in the vicinity of the scrotum. Incidence of cryptorchidism has been reported for many species of domestic and wild animals, including cats, dogs, Florida panthers, mountain lions, and black bears.

Radiography is of limited use for detection of cryptorchidism, because intra-abdominal testes usually are not identified, unless they have increased greatly in size. Ultrasonography, however, can be of assistance in the detection of retained testes. The development of secondary sexual characteristics in male ferrets with cryptorchidism has been observed by the author, but the use of such characteristics for diagnosis of cryptorchidism is unknown. Measurement of hormone concentrations in male ferrets as an indicator for cryptorchidism also has not been reported.

Analysis of medical records from my clinic was conducted. Between 1995 and 1998, 1,597 male ferrets between 6- and 8-weeks-old that were owned by a private breeder underwent elective orchietomy. Bilateral scrotal testes were evident in > 99%; 12 (0.75%) were cryptorchid (unilaterally or bilaterally, inguinal or intra-abdominal). A $\chi^2$ test-of-fit with 1 df and Yates correction was used to evaluate the data, using equal incidence of the types of cryptorchidism as a null distribution. Significantly (P = 0.05) more ferrets were unilaterally cryptorchid (10/12) than bilaterally cryptorchid (2/12). In unilaterally cryptorchid ferrets, there was not a significant difference between abdominal (3 on the left side, 2 on the right side) and inguinal (5 on the left side, none on the right side) location or side on which the cryptorchid testis was found (8 on the left side, 2 on the right side). All testes of bilaterally cryptorchid ferrets were located only intra-abdominally. Only 1 (0.06%) ferret was an apparent monorchid, with only the left testis in the scrotum.

Cryptorchidism has, or is frequently postulated to have, a genetic basis in some species but also may be influenced by maternal or prenatal hormones during development, environmental contamination, nutritional deficiency of the dam during fetal development, and delayed testicular descent. In dogs, cryptorchidism of the right testis predominates, which is speculated to be the result of a longer path of descent from the intra-abdominal location near the kidney to the scrotum. That observation for dogs differs for the ferrets reported here and for cryptorchid cats. These ferrets did not have a significant difference in incidence of inguinal versus intra-abdominal testes. The ferret population evaluated is unlikely to be inbred, assuming cryptorchidism in ferrets has a genetic basis, because of the low incidence of cryptorchidism. However, it is possible that the incidence of cryptorchid ferrets is much higher when cryptorchidism is coupled with other congenital defects, which may have caused culling of those ferrets prior to elective orchietomy.

Veterinarians frequently are requested to examine ferrets that were purchased by owners who assumed that they had been neutered and descended. Body condition or behavior consistent with a sexually intact male may indicate retained testes in cryptorchid male ferrets. Conversely, a monorchid ferret may have 2 testes, 1 in the scrotum and the second of which is retained in the inguinal area or abdomen, or it may be a monorchid as the result of descent of a cryptorchid testis after an improperly performed castration. Veterinarians should encourage clients to purchase ferrets from reputable breeders or dealers who can ensure their animals have been properly neutered.

Outcome

Surgical removal of the scrotal testis was unremarkable. The ferret recovered without complications.

References