Short Communication

DOI: 10.48165/ijar.2025.46.01.13

The Indian Journal of Animal Reproduction
The official journal of the Indian Society
for Study of Animal Reproduction
Year 2025, Volume-46, Issue-1 (March)

ISSN 0970-2997 (Print)
ISSN 2583-7583 (Online)

Left Testicular Hypoplasia and Right Cryptorchid Testes Seminoma in a German Shepherd Dog

Ravi Shreemathi[1], Ravichandran Ruthrakumar[1*], Senthil Kumar Jawahar Vinayaga[1], Duraisamy Gopikrishnan[1], Kuppusamy Gopal[2] and Mani Selvaraju[1]

[1]Department of Veterinary Gynaecology and Obstetrics,
[2]Department of Veterinary Pathology
Veterinary College and Research Institute, Namakkal- 637 002, India
Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai, India

ABSTRACT

This paper describes in detail a case of seminoma in an 8-year-old German Shepherd male dog with the history of distended abdomen and urinary incontinence and its successful surgical management.
Keywords: Dog, gynecomastia, cryptorchidism, prostatic hyperplasia, seminoma

How to cite: Shreemathi, R., Ruthrakumar, R., Vinayaga, S. K. J., Gopikrishnan, D., Gopal, K., & Selvaraju, M. (2025). Left testicular hypoplasia and right cryptorchid testes seminoma in a German Shepherd dog. *The Indian Journal of Animal Reproduction,* 46(1),77-80.10.48165/ijar.2025.46.01.13

INTRODUCTION

Subsequent to skin and fibrous tissue tumors, testicular tumors are the most prevalent type of neoplasm in dogs and are the third most commonly reported tumor type (Nodtvedt *et al.,* 2011). Nielsen and Lein (1974), classified the testicular tumors as follows: (1) germ cell tumors (seminoma, embryonal carcinoma, and teratoma); (2) sex cord-stromal tumors (Sertoli cell tumor and Leydig cell tumor); (3) multiple primary tumors; (4) mesothelioma; and (5) stromal and vascular tumors. The inability of the testicles to descend into the scrotum is known as cryptorchidism. Both unilateral and bilateral forms are possible, however unilateral forms are more typical and widespread (Boothe, 2007). A prostatic enlargement is known as prostatic hyperplasia. Prostatic hyperplasia and cryptorchidism are the two distinct disorders in dogs. While they both involve reproductive organs, there isn't a direct relationship between them. Nonetheless, there may exist certain implicit associations or common risk factors: 1) Predisposition by breed. 2) Hormonal factors such as imbalances in androgen hormones. While prostatic hyperplasia is influenced by androgens (male hormones) during a dog's lifetime, cryptorchidism is frequently linked to aberrant hormone levels during fetal development. 3) In an intact male dogs with cryptorchidism (undescended testicles), exposure to elevated testosterone levels may increase the likelihood of certain abnormalities, such as prostatic hyperplasia, developing in the retained testicle. 4) Age and condition of Neutering: male dogs that are older and intact are more likely to develop prostatic hyperplasia. However,

*Corresponding author.
E-mail address: jayatamil9777@gmail.com (Ravichandran Ruthrakumar)
Received ; 23.05.24 Accepted 10.02.25

prostatic hyperplasia and the consequences of cryptorchidism can be avoided with neutering. Cryptorchid dogs have an increased risk of developing testicular neoplasia with an increased susceptibility to Sertoli cell tumor and seminoma. This paper describes in detail a case of seminoma in an 8-year-old German Shepherd male dog with the history of distended abdomen and urinary incontinence.

CASE HISTORY AND OBSERVATIONS

An 8-year-old German Shepherd male dog was referred to Small Animal Gynaecology and Obstetrics Unit, Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the anamnesis of distended abdomen, urinary incontinence and bilateral alopecia. General clinical examination revealed all the vital parameters were within the normal range and conjunctival mucous membrane was moderately congested. Andrological examination revealed right unilateral cryptorchidism and gynecomastia. Urine was relieved aseptically by catheterization. Digital rectal palpation evinced polymorphic enlarged mass. Ultrasonographic examination showed the presence of hyperechoic mass at the right side of the abdominal cavity. The volume of the prostate was measured as 18.42 cm^3 (Prostate volume = Length × Width × Height × 0.524) by ultrasonography. But depending upon body weight this dog's normal prostatic volume is 11.53 cm^3 (Prostatic volume = 0.33 × B.wt + 3.28). The radiographic examination gave no evidence of cystic or urethral calculi and no pulmonary metastasis. Based on these findings, the case was diagnosed as benign prostatic hyperplasia in a cryptorchid dog. The serum hormonal estimation revealed decreased testosterone concentration of 0.37 ng/ml (normal range 0.05-3.70 ng/ml) and increased estrogen 68 pg/ml (8.6-31.5 pg/ml). The urinalysis showed positive for proteins and leukocytes.

TREATMENT AND DISCUSSION

Under general anaesthesia the surgery was performed as per standard protocol. Anesthesia was induced with Inj. Dexmedetomidine @ 5 mcg/kg i.v., Inj. Butorphanol @ 0.2mg/kg i.v., and maintained with Inj. Propofol @ 3 mg/kg i.v., Mid ventral coeliotomy was performed to remove the enlarged retroperitoneal testicle (Fig. 1a) and a pre-scrotal incision was made to remove the left descended testicle (Fig. 1b). The skin was closed by a cross mattress suture pattern using sterile cotton thread. Post-operatively the pet was treated with Inj. Ringer's lactate @ 10 ml/kg i.v.,, Inj. Metronidazole @ 15 mg/kg i.v., Inj. Ceftriaxone @ 20 mg/kg i.v., Inj. Pantoprazole @ 1 mg/kg i.v., and Inj. Tramadol @ 2 mg/kg s.c. Antibiotics and fluids were continued for 5 more days and advised Tab. Urispas (200 mg) for 3 days and Tab. Finasteride (0.5mg/kg) for a month. Both the testicles were submitted for histopathological examination and the results showed a sheet of polyhedral cells within the seminiferous tubules (Fig. 2. classical seminoma) in the right retroperitoneal testis and left descended testicular tissue showed small seminiferous tubules and no spermatogenic lineage within the lumen (Fig. 3. testicular hypoplasia). After a month, the volume of the prostate was measured as 11.06 cm^3.

A congenital disorder known as canine cryptorchidism is brought on by sex-restricted autosomal recessive genes. Small breeds are far more prone to cryptorchidism and are much more likely to have it than other breeds, which is why the condition is more common in dogs of the Chihuahua, Miniature Schnauzer, Pomeranian, Poodle, Siberian Husky, and Yorkshire breeds (Peters *et al.,* 2000). Carriers are the parents of puppies afflicted with cryptorchids. Dogs with unilateral cryptorchid syndrome may still be fertile, but in order to lower the incidence of such cases, breeding programs should not include cryptorchid individuals or their siblings. Testicular tumor development is predisposed by cryptorchidism (Peters *et al.,* 2000). In this instance, one could argue that unilateral cryptorchidism served as a predisposing factor for seminoma. A seminoma is an embryonic tumor that develops in the testicles from a primitive germ cell. Although the specific etiology of seminoma remains unclear, testosterone and other hormones may play a role in its development.

One important male sex hormone, testosterone, is important for the growth and upkeep of male reproductive organs as well as secondary sexual traits in dogs. Testosterone works by binding to androgen receptors found in the testicles and other tissues. The response of cells to testosterone can be modified by alterations or mutations in androgen receptors, which may have an impact on the development and differentiation of cells. Testicular cancers may originate or advance as a result of disruption in this regulatory process, albeit the precise mechanisms are intricate and multifaceted. Dogs that are male often have low levels of estrogen. However, there may be abnormal oestrogen production in testicular tumor situations like seminoma.

Dogs with seminomas may have higher levels of estrogen due to the modest amounts of estrogen or molecules that imitate estrogen (estrogenic compounds) that are produced. The term "estrogenic paraneoplastic syndrome"

describes this condition. Male dogs with seminoma may exhibit a variety of clinical signs and symptoms due to elevated estrogen levels, including expansion of the mammary glands (gynecomastia), swelling of the nipples, and behavioural and physical changes resembling feminization. The hormone promotes the growth of breast tissue and changes in secondary sexual traits. The impact of seminoma on hormones must be managed in a complex way. The main treatment for seminoma is orchidectomy, which lowers the tumor's production of testosterone and estrogen and helps to restore hormonal balance. Depending on the stage and extent of the tumor, further therapies like radiation or chemotherapy may be recommended.

Benign Prostatic Hyperplasia (BPH) is a common condition in older intact (non-neutered) male dogs, characterized by the non-cancerous enlargement of the prostate gland. In addition, BPH changes the properties of the prostatic fluid and chronically lowers the quality of sperm, acting as a key cause of infertility in male dogs. Thus, dogs with potential plans to be used for breeding are recommended to undergo medical treatment (Niżański *et al.,* 2014). Although the etiology of BPH has not been clearly elucidated, dihydrotestosterone (DHT) is known to play an important role in the normal growth and development of the prostate. Thus, drug therapy using finasteride, a 5-α reductase inhibitor, is used in dogs to treat BPH (Angrimani *et al.,* 2020 and Sirinarumitr *et al.,* 2002). As a medical treatment, hCG or GnRH applications are used to increase endogenous or exogenous LH activity. Finasteride (@ 0.5mg/kg) is a medication primarily used to treat benign prostatic hyperplasia (BPH) and male pattern of baldness (androgenic alopecia) (Angrimani *et al.,* 2020). It works by inhibiting the enzyme 5-alpha-reductase, which converts testosterone into dihydrotestosterone (DHT), a hormone that contributes to prostate growth. By reducing DTH levels, finasteride helps shrink the prostate gland, relieving symptoms such as frequent urination, difficulty urinating and urinary retention. In addition to medical treatment, orchidectomy or laparoscopic removal of testicles is one of the most preferred methods. According to Faria (2018), the recommended treatment is bilateral orchiectomy, together with histological examinations to confirm the existing type of neoplasm (Peters *et al.,* 2000). Canine BPH is a manageable condition with various treatment options.

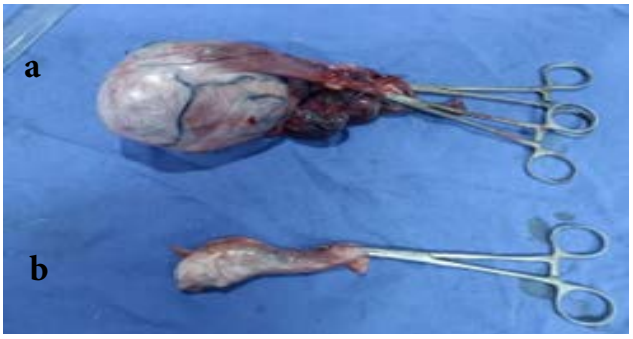

Fig. 1a. – Retained right retroperitoneal testicle

1b – Left descended testicle

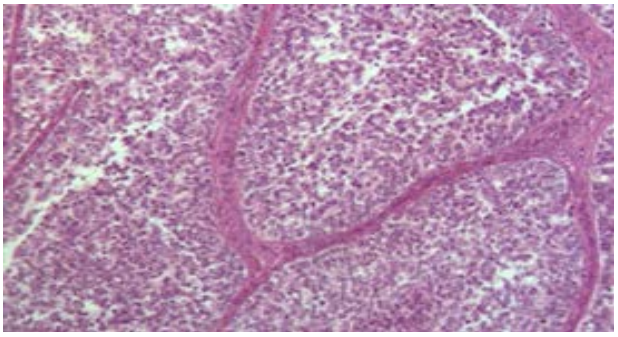

Fig. 2. Right retroperitoneal testis showing sheet of polyhedral cells within the seminiferous tubules indicative of classical seminoma (H&E×100)

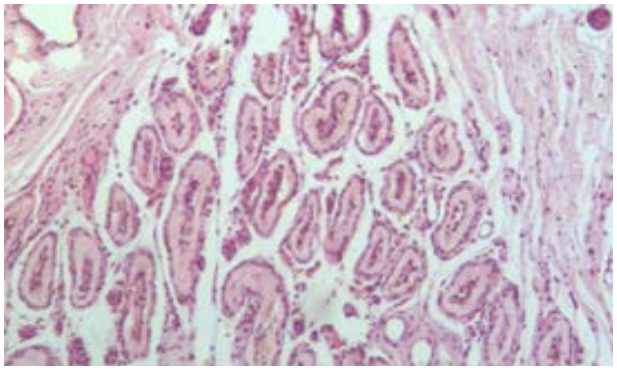

Fig. 3. Left descended testis showing small seminiferous tubules without spermatogenic activity indicative of testicular hypoplasia (H&E×100)

CONCLUSION

The cryptorchid dogs or intact non-breeding dogs should be castrated earlier in their life to prevent complications like testicular tumors and BPH. Regular veterinary care, including routine examinations and monitoring of urinary health, is essential for early detection and optimal management of BPH in older male dogs.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

REFERENCES

Angrimani, D.S.R., Brito M. M., Rui B. R., Nichi M. and Vannucchi C. I. (2020). Reproductive and endocrinological effects of Benign Prostatic Hyperplasia and finasteride therapy in dogs. *Sci. Rep.*, **10**:14834

Boothe, H. W. (2007). Testiculos e Epididimos. In; SLATTER D H. Manual de Cirurgia de Pequenos Animais, 2ed. Maole, Sao Paulo, pp. 1527-1529.

Faria, B. M., Bertolo P. H. L., Macedo B. C., Giese E. G. and Pereira W. L. A. (2018). Sertolioma em um canino associado à criptorquidia. *Pub. Vet.,* **16**:1-4.

Nielsen, S.W. and Lein D.H. (1974). Tumors of the testis. Bull World Health Organ. **50** (12):71

Niżański W., Levy X., Ochota M. and Pasikowska J. (2014). Pharmacological treatment for common prostatic conditions in dogs - benign prostatic hyperplasia and prostatitis: an update. *Reprod. Domest. Anim.,* **49**(2):8-15

Nodtvedt, A., Gamlem H., Gunnes G., Grotmol T., Inderbø A.and Moe L. (2011). Breed differences in the proportional morbidity of testicular tumours and distribution of histopathologic types in a population-based canine cancer registry. *Vet. Comp. Oncol.,* **9**:45–54.

Peters, M. A., De Rooij D. G., Teerds K. J., Van Der Gaag I. and Van Sluijs F. J. (2000). Spermatogenesis and testicular tumors in aging dogs. *Reprod. Fert.,* **120**(2):443-452.

Sirinarumitr, K., Sirinarumitr T., Johnston S. D., Sarkar D. K. and Kustritz M. V. (2002). Finasteride-induced prostatic involution by apoptosis in dogs with benign prostatic hypertrophy. *Am. J. Vet. Res.,* **63**:495-498.