

MALE GENITAL SYSTEM LESIONS IN DOGS DIAGNOSED BY CYTOLOGICAL EXAMINATION

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Abstract

Understanding the pathological processes occurring in the male genital system requires advanced knowledge about its morphofunctional features. Even though the lesions of the male genital system in the dog are not as common, they constantly occur in general practice often being regarded as challenging in terms of diagnosis, treatment and prognosis. This study aims to evaluate the epidemiology, the cytological features and the efficacy of the cytological examination in achieving a definitive diagnosis in male genital system lesions in dogs.

This study was conducted over a 5 years period (2008-2012) in the Department of Pathological Anatomy of the Faculty of Veterinary Medicine Bucharest and consists of 109 male dogs presenting genital lesions. The samples were obtained by fine needle aspiration, imprinting, scraping and surgical biopsy. The slides were prepared by squeezing and sliding techniques. For cytologically examined samples Romanowsky type stains were used: classic or quick May-Grünwald Giemsa and Diff-Quick. 29 cases of testicular lesions were both cytologically and histologically examined.

During these 5 years, a total of 1872 male dogs have been specifically examined and 109 (5.8%) presented genital lesions. Of the 109 dogs considered for the study, 104 (95.4%) had testicular lesions and 5 (4.6%) had penile lesions. The 104 testicular lesions were diagnosed as follows: 20 cases (19.2%) with cryptorchidism and testicular hypoplasia, 16 cases (15.4%) with testicular degeneration, 10 cases (9.6%) with orchitis, and 58 cases (55.7%) with testicular tumours: seminoma (n=15), Sertoli cell tumours (n=13), interstitial (Leydig) cell tumours (n=15), mixed testicular tumours (n=15). The diagnosed penile lesions included acute balanoposthitis (n=1), squamous cell carcinoma (n=1) and transmissible venereal tumours (n=3). In both cytologically and histologically examined cases, cytological diagnosis was confirmed by histological diagnosis in 90% of the cases. Diagnostic errors occurred in individuals presenting testicular tumours where cytological examination did not confirm histological findings; in these cases histological examination revealed mixed tumours.

Key words: male genital system, lesions, dogs, cytological diagnosis

INTRODUCTION

Male genital system lesions are important in male dogs' pathology, with neoplastic testicular tumours occurring most frequently (Moulton 1990, MacLachlan, 2002, Dinescu, 2005, Cătoi, 2008).

Testicular enlargement and testicular asymmetry, as well as the presence of sanguinolent preputial discharge warrant cytological examination as highly recommended (Dinescu 2005, Raskin, 2010).

Considering the numerous stray individuals and the potential risk of venereal disease transmission, when faced with genital lesions in male dogs, achieving an accurate diagnosis is essential in order to proceed with treatment. In this context, a definitive diagnosis can be achieved by cytological examination which is a

minimally invasive and easy to perform technique, involving low costs and is commonly used in veterinary practices and diagnostic laboratories.

MATERIALS AND METHODS

The study was conducted over a period of 5 years (2008-2012) in the Department of Pathological Anatomy of the Faculty of Veterinary Medicine Bucharest and consists of a total of 109 male dogs presenting genital system lesions. Our study aims to evaluate the epidemiology and morphological features of such lesions, as well as the efficacy of sample collection meant for cytological examination.

The samples were obtained by fine needle aspiration, imprinting, scraping and surgical biopsy. The slides were prepared by squeezing and sliding techniques. For cytologically

examined samples Romanowsky type stains were used: classic or quick May-Grünwald Giemsa and Diff-Quick. 29 cases of testicular lesions were both cytologically and histologically examined.

RESULTS AND DISCUSSIONS

Table 1 summarizes the data we collected during our 5 year study.

Table 1. Total of cases evaluated since 2008 until 2012

Year	Examined male dogs	Examined male dogs presenting genital system lesions	
2008	462	27	5.8%
2009	246	17	6.9%
2010	370	18	4.9%
2011	425	22	5.2%
2012	369	25	6.8%
Total	1872	109	5.8%

Of the 109 dogs evaluated in the study, 104 (95.4%) had testicular lesions and 5 (4.6%) had penile lesions.

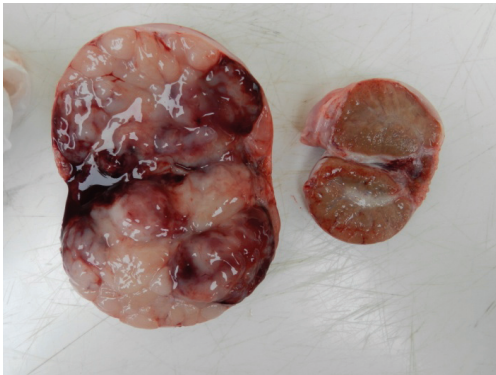


Figure 1. Testicular tumour – gross morphology. Enlarged and compact testicle, with fatty density and hemorrhagic patches on cut-section

The 104 testicular lesions were diagnosed as follows: 20 cases (19.2%) with cryptorchidism and testicular hypoplasia, 16 cases (15.5%) with testicular degeneration, 10 cases (9.6%) with orchitis, and 58 cases (55.7%) with testicular tumours.

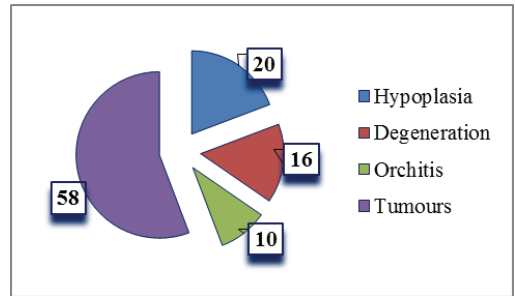


Figure 2. Distribution of testicular lesions

The samples were collected by fine-needle aspiration and imprinting techniques after orchidectomy had been performed.

Cytological examination of the hypoplastic and degenerative lesions only helped orientate the diagnosis as definitive diagnosis was achieved following histological examination.

Diagnosing inflammatory processes (orchitis, balanoposthitis) was straight-forward based on the presence of numerous inflammatory cells, particularly neutrophils.

Tumoral lesions occurred most frequently, encompassing 50% of the total number of evaluated lesions in our study. Figure 3 is a graphic representation of the various types of testicular tumours diagnosed in the 58 male dogs presenting such lesions.

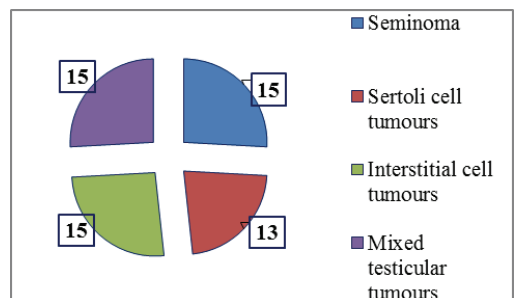


Figure 3. Diagnosed testicular tumours

As we can see, the various tumoral lesions occurred in fairly similar proportions. Even though Sertoli cell tumours occurred less, the differences were not significant.

In general cytological examination was essential for achieving a definitive diagnosis in tumoral lesions. In mixed testicular tumours, cytological examination failed to confirm the results yielded by histological examination.

Cytological diagnosis is based on cell appearance, nuclei and extracellular space assessment (Baker, 2000, Dinescu 2002).

In seminoma, cytological examination revealed a predominance of large cells, with round vesiculated central or eccentric nuclei. The nucleoli are evident and a small amount of slightly basophilic cytoplasm can be observed. The presence of bi- and multinucleated cells and a high mitotic index represent specific features of seminomas. The presence of numerous lymphocytes among the tumoral cells represents an invaluable element aiding diagnosis.

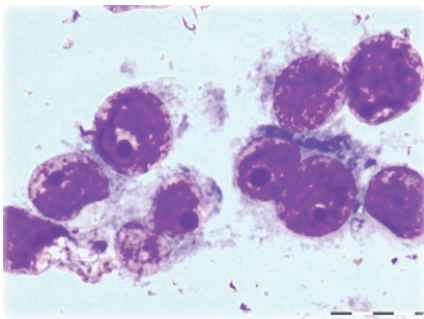


Figure 4. Seminoma. Large round cells, with large nuclei and evident nucleoli. MGG stain, x400

Cytological examination of Sertoli cell tumours revealed large round or stellate cells, presenting large nuclei with finely granulated chromatin. A specific feature is the presence of intracytoplasmic vacuoles varying in size. Free nuclei can occasionally be noticed and vacuoles are seen in the background.

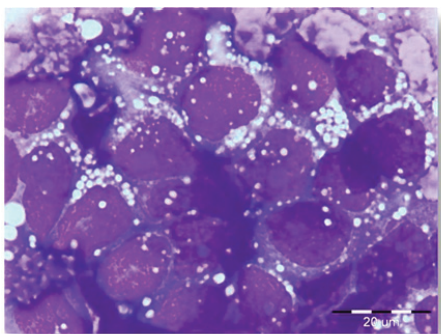


Figure 5. Sertoli cell tumour. Large cells, with vacuolated cytoplasm and reticulated nuclear chromatin. MGG stain, x1000

Interstitial cell (Leydig cell) tumours are easily diagnosed by cytological examination based on the round hyperchromatic eccentric nuclei and abundant foamy cytoplasm. Occasionally, the cytoplasm presents fine basophilic granules.

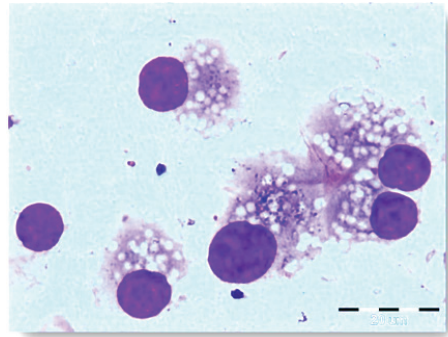


Figure 6. Interstitial cell tumour. Large cells, with reduced N:C ratio, eccentric nuclei and abundant, finely granulated, basophilic cytoplasm. MGG stain, x400

Testicular tumours generally tend to be more challenging as far as cytological diagnosis is concerned (Raskin 2010) but a judicious sample examination, identifying the specific elements of each tumour type, corroboration with epidemiology data and the clinician's level of expertise, most likely a combination of all of the above will ensure that an accurate definitive diagnosis is eventually achieved. Mixed testicular tumours did pose considerable diagnostic challenge during cytological examination and for that reason definitive diagnosis was achieved following histological examination.

The following penile lesions were diagnosed: acute balanoposthitis (n=1), squamous cell carcinoma (n=1) and transmissible venereal tumours (n=3). Sample collection was achieved by scraping and imprinting.

Penile lesions did not raise any difficulties in reaching a definitive diagnosis by cytological examination.

Penile squamous cell carcinoma presented macroscopically as a neoplastic growth located on the middle third on the dorsal aspect of the penis. Cytological examination revealed pleomorphic squamous cells, presenting moderate anisocytosis and anisokaryosis, basophilic cytoplasm and perinuclear microvacuoles.

Achieving definitive cytological diagnosis for transmissible venereal tumours was straightforward based on the presence of monomorphic round cells, with round nuclei presenting coarse nuclear chromatin and clearly defined nucleoli varying in size and number and small amounts of vacuolated cytoplasm (Fig. 7). Transmissible venereal tumours have been cytologically described as lymphocyte-like, plasma cell-like and lympho-plasmacytoid (Amaral, 2007). In plasmacell-like subtype cells are ovoid, with eccentric nuclei, abundant cytoplasm, and numerous clear cytoplasmic vacuoles. Lymphocytoid tumour subtype has a predominance of round cells, with finely granular cytoplasm and few vacuoles in their peripheral region. In our study we encountered the lymphocyte-like and the lympho-plasmacytoid subtypes.

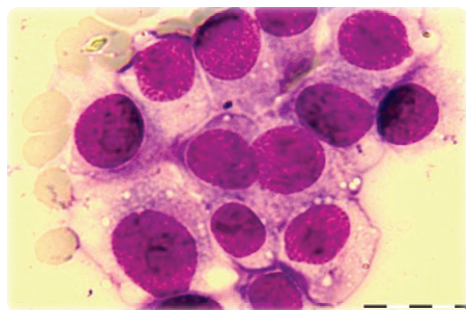


Figure 7. Monomorphic round cells, presenting round nuclei with coarse chromatin and abundant, finely vacuolated cytoplasm. MGG stain, x400

The acquired results indicated that cytological examination was essential for diagnosing male genital system lesions in dogs and in the majority of cases a definitive diagnosis was achieved only by cytological examination. In both cytologically and histologically examined cases, cytological diagnosis was confirmed by histological diagnosis in 90% of the cases.

CONCLUSIONS

Male genital system lesions accounted for 5.8% of the total number of male dogs that were specifically examined in the 5 year time frame.

The 104 testicular lesions were diagnosed as follows: 20 cases (19.2%) with cryptorchidism and testicular hypoplasia, 16 cases (15.4%) with testicular degeneration, 10 cases (9.6%) with orchitis, and 58 cases (55.7%) with testicular tumours: seminoma (n=15), Sertoli cell tumours (n=13), interstitial (Leydig) cell tumours (n=15), mixed testicular tumours (n=15).

The diagnosed penile lesions included acute balanoposthitis (n=1), squamous cell carcinoma (n=1) and transmissible venereal tumours (n=3). In both cytologically and histologically examined cases, cytological diagnosis was confirmed by histological diagnosis in 90% of the cases.

REFERENCES

- Anne Santos do Amaral, Sandra Bassani-Silva, Isabelle Ferreira, L. S. da Fonseca, F. H. E. de Andrade, L. F. J. Gaspar, Rocha N.S. 2007. Cytomorphological characterization of transmissible canine venereal tumor. *RPCV* 102 (563-564), 253-260.
- Baker R., Lumsden J.H. 2000. *Color Atlas of Cytology of the Dog and Cat*, 1st edn., Mosby, Missouri, USA, 242-251.
- Cătoi C., Moussa R., Bolfă P., Tăulescu M., Negrea O 2008. Morphological Study of Testicular tumors in dogs. *Scientific Works, Veterinary Medicine*, vol. XLI, Timișoara, 100-105.
- Dinescu Georgeta, T. Soare, Manuella Militaru, Emilia Ciobotaru 2002. Cytological and histological investigations in dog testicle tumours. *Romanian Journal of Comparative Oncology*, Nr. 6, 398-401.
- Dinescu Georgeta, Emilia Ciobotaru, Manuella Militaru 2005. Morfologia principalelor afecțiuni testiculare la câine. *Rev. Rom. Med. Vet.* vol. 15 (2), 33-42.
- MacLachlan, N.J., P.C. Kennedy 2002: Tumours of the genital systems. In: *Tumours in Domestic Animals*. (Meuten, D. J., Ed.). 4th ed. Iowa State Press. Iowa, 547-574.
- Moulton J.E., 1990. *Tumors in Domestic Animals*, third edition. University of California Press Berkeley USA, 479-498.
- Raskin Rose, Meyer J.D., 2010. *Canine and Feline Cytology. A Color Atlas and Interpretation Guide*. Saunders Elsevier, St. Louis, USA, 300-308.