

## Intrascrotal testicular torsion and seminoma in a dog with chronic renal failure

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Received: 16.08.2010 • Accepted: 27.02.2012 • Published Online: 22.01.2013 • Printed: 22.02.2013

**Abstract:** A 10-year-old mongrel dog was presented with signs of vomiting, prostration, anorexia, abdominal pain, dyspnea, dysuria, and enhanced scrotal volume. Clinical, laboratory, and radiological examinations showed intrascrotal testicular pathology and chronic renal failure. Emergency treatment was carried out; however, the patient died. Necropsy diagnosed an intrascrotal testicular torsion and seminoma. The aim of the present report is to describe an intrascrotal testicular torsion associated with chronic renal failure in a dog.

**Key words:** Testicular torsion, seminoma, chronic renal failure, dog

### 1. Introduction

Torsion of the dehiscent testis is a rare pathology in dogs (1–3). The majority of the cases are seen in cryptorchid animals. This pathology can be categorized as acute (less than 24 h), subacute (1 to 10 days), and chronic (more than 10 days) (4).

The basic etiopathogenesis of this condition is sudden contraction of the cremaster muscle that causes a spiral rotation of the testis and impairs the venous return. The resulting edema causes blood vessel compression and may lead to vascular rupture, interstitial hemorrhage, generalize ischemia, and testicular infarct (5). Organ necrosis can occur in cases where the torsion lasts for more than 3 h (6).

Doppler ultrasonography plays an important role in the diagnosis of a testicular torsion, as well as distinguishing it from other diseases presenting similar symptoms (7,8). However, a definitive diagnosis is obtained only during surgery or necropsy (4). Hence, testicular torsion is considered as a surgical emergency that requires immediate intervention (5).

Seminomas are germ cell tumors of the testicular spermatogenic epithelium that occur more frequently in aged animals (9). This tumor presents a low metastatic character (6% of cases) and rarely triggers a paraneoplastic syndrome manifested by alopecia, hyperpigmentation, prostatic squamous metaplasia, diabetes mellitus (10), and bone marrow aplasia due to hyperestrogenism (8). Clinical signs of the seminoma include abdominal and local pain, anorexia, lethargy, vomiting, dysuria, marching

dysfunction, and hyperthermia (3). In dogs, the treatment of choice for seminoma is bilateral orchiectomy (8).

This paper aims to describe the clinical, laboratory, and necropsy findings of an intrascrotal testicular torsion associated with chronic renal failure in a dog.

### 2. Case history

A 10-year-old mongrel male dog was referred to the Veterinary Teaching Hospital of Franca University (UNIFRAN, Brazil) with clinical signs of vomiting, prostration, and anorexia. Clinical history revealed abdominal pain, dyspnea, dysuria, and increased volume of the scrotum in the past 20 days. Physical examination showed a hydrocele, enhanced and irregular size of the right testicle, bilateral pulmonary wheezing, and intense dehydration.

Laboratory findings revealed moderate normocytic normochromic anemia and increased serum concentrations of the urea, creatinine, and total protein (Table). No urine sample was collected due to anuria. Radiological examination of the thorax showed bilateral pulmonary edema. Oxygen therapy was performed via an endotracheal tube, but the patient remained in refractory hypoxemia. A medical isotonic NaCl solution infusion (70 mL/kg, IV), mannitol 10% (0.5 g/kg, bolus, IV), metoclopramide (0.4 mg/kg, SC), cimetidine (3 mg/kg, IV), and ampicillin (22 mg/kg, IV) were administered. Despite emergency medical therapy, the patient died within a few hours.

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**Table.** Hematologic and serum biochemical profile of dog with testicular torsion and chronic renal failure.

Hematology		
		Range
Red blood cells ( $10^6/\mu\text{L}$ )	3.69	5.5–8.5
Hematocrit (%)	8	12–18
Hemoglobin (g/dL)	25.3	37–55
Leucocytes ( $10^3/\mu\text{L}$ )	12.8	6–18
Platelets ( $10^3/\mu\text{L}$ )	317	180–400
Serum biochemical profile		
		Range
Urea (mg/dL)	571.0	15–65
Creatinine (mg/dL)	13.0	0.5–1.5
Alkaline phosphatase (U/L)	66.3	20–150
Alanine aminotransferase (U/L)	85.1	10–88
Total protein (g/dL)	9.0	5.9–7.9

Necropsy was performed with the permission of the patient's owner.

Small fragments of the testis and epididymis were collected and sent for histological analysis. The samples were fixed in formalin, dehydrated in alcohol, cleared in xylene, and embedded in paraffin. Cuts of 4  $\mu\text{m}$  in thickness were obtained by microtome and stained with hematoxylin–eosin (H&E) on microscope slides that were overlaid with coverslips. The sections were examined with a light microscope under 10 $\times$  to 40 $\times$  magnification.

### 3. Results and discussion

Macroscopically, increased volume of the right testis (10  $\times$  7  $\times$  7 cm) with superficial, firm, grayish nodules measuring 1 to 2 cm in diameter were seen. The epididymis also contained innumerable firm, whitish nodules (0.5 to 1.5 cm in diameter). In addition, the pampiniform plexus had 360° torsion (Figures 1a and 1b) and was surrounded by 200 mL of translucent liquid.

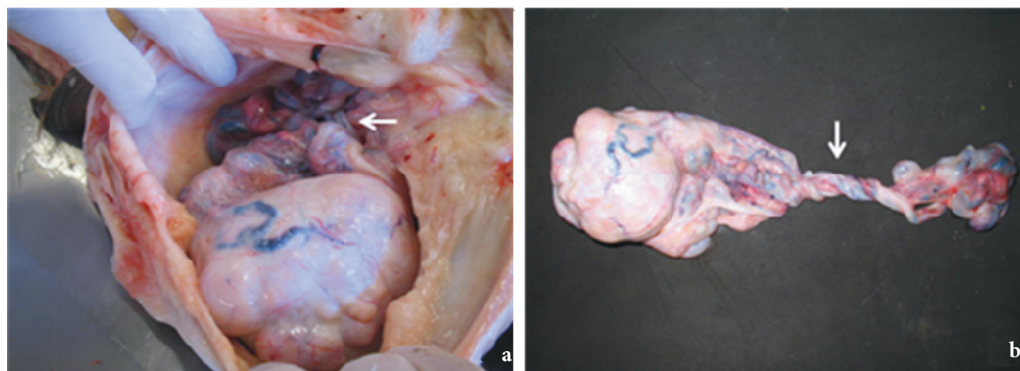
Microscopical examination of the right testis tissue showed neoplastic cell proliferation in the seminiferous tubules (intratubular seminoma), with moderate pleomorphism, innumerable mitosis (Figures 2 and 3), and necrotic and calcified areas. Furthermore, in the nodules on the epididymis, spermatic granuloma with mononuclear infiltrate and wide necrotic area was observed. In addition, bilateral kidney atrophy, interstitial nephritis, and acute pulmonary edema with inflammatory infiltrate, all signs

compatible with chronic renal failure and adult respiratory distress syndrome (ARDS), were noticed.

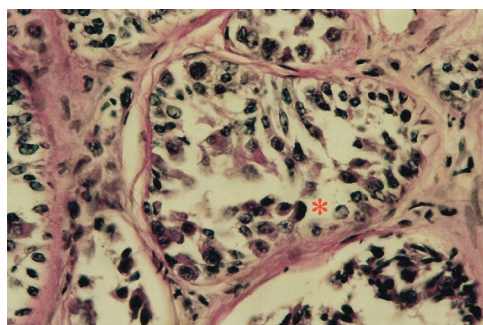
In dogs, seminomas have similar incidence when compared to Sertoli cell tumors, although both are seen less frequently than interstitial cell tumors. Sertoli cell tumors are distinguished from seminomas if there is a testicular enlargement or signs of feminization (9). Once there are no signs of hyperestrogenism, despite the normocytic normochromic anemia, we suppose that these findings can be due to both disturbances of erythropoiesis and changes in the plasma environment due chronic kidney disease (11). In addition, ARDS is a common syndrome encountered in critically ill patients and should always be investigated in cases of generalized infections, sprained organs, pancreatitis, pyometra, prostatitis, and other diseases such as extrapulmonary pathologies (3).

Emergency treatment in dogs with chronic renal failure and ARDS is complex and usually unsuccessful. Treatment is based on parenteral fluid therapy for rehydration and restoration of diuresis. If the current therapy fails, dialysis is often recommended and should be performed (8). Oxygen therapy, analysis of blood gases, and adjuvant therapy with antiemetics and prophylactic antibiotics are also important in these diseases.

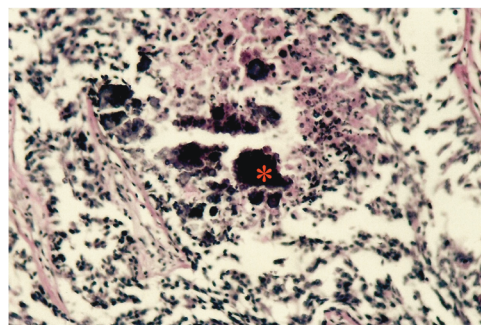
Seminomas present with high incidence in dogs with ectopic testis (12); however, an intrascrotal testicular seminoma is rarely encountered in dogs. Considering that 36% of the cases of testicular torsion are associated with



**Figure 1.** Increased testicular tissue and 360° torsion (arrows) of pampiniform plexus (a and b).



**Figure 2.** This microscopic view shows the right testis with neoplastic cell proliferation (\*) from the seminiferous tubules. H&E, 400x.



**Figure 3.** Microscopic visualization of calcification areas (\*) in the testis parenchyma. H&E, 100x.

testicular neoplasias, we suppose that in this report, the presence of a testicular seminoma was the major event that unleashed the torsion of the right testis (3,10,13).

The histopathological findings of chronic renal failure, associated with azotemia (creatinine 13 mg/dL, urea 571 mg/dL) and anuria, can be considered as a frame for exacerbation of chronic renal failure (11). Nevertheless, it is assumed that the injury caused by the testicular torsion may have led to acute kidney injury, probably caused by toxemia due to necrosis of the testicular tumor, decreased glomerular filtration rate, ascending urinary tract infection (14), or destabilization of the patient due to the decrease of water intake and clinical signs of vomiting.

In humans, there are similar descriptions in patients with decompensation of preexisting illness prior to testicular torsion (15), although most studies prioritize the

acute and subacute forms of torsion, assessing damages in spermatogenesis (6,7) and inflammation in the contralateral testis (14). There are no reports of a chronic torsion in animals with a preexisting disease.

Thus, in dogs with testicular neoplasia, bilateral orchietomy should be carried out (12). For that reason, it is important to explain to the owner the clinical, surgical, and anesthetic risks as well as the importance of a bilateral orchietomy, aiming to prevent further complications.

Testicular torsion is an acute and emergent disease in which the patient presents with great pain. The diagnosis must be carried out quickly and the surgical treatment must be performed immediately. Therefore, the present report assessed rare complications of a testicular torsion and evidenced its poor prognosis when associated with chronic renal disease.

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