ABSTRACTS

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Unilateral orchidectomy in mature cats is not followed by compensatory hypertrophy

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OBJECTIVES AND METHODS: The effect of hemicastration on the remaining testis has not been described in the domestic cat. The aim of this study was to describe the effect of unilateral orchidectomy on testicular characteristics of mature domestic cats. Five, 1 to 2 years old, crossbreed male cats were unilaterally orchidectomized on day 0 (right testis) and day 60 (left testis). The testes were weighed and measured (length and width). Testicular volume and gonadosomatic index (1) were also calculated. The testes were processed for histological and immunohistochemical evaluation. Histological images were obtained from a microscope with objective magnifications of x10 and x40, through an attached video camera and digitalized in a 24 bit true color TIFF format. Fifteen to twenty tubular profiles were chosen randomly and measured for each testis. The maximum, minimum and medium tubular diameters, major and minor axes, area and perimeter of seminiferous tubules and germinal epithelium height were measured at x10 by planimetry (Image Pro Plus, USA). The volume of the testicular tissue components were determined by light microscopy using a 441 intersection grid placed on x40 magnification photographs. For this, fifteen fields were chosen randomly (6615 points) and scored for each testis. Points were classified as one of the following: spermatogonia, primary and secondary spermatocytes, rounds spermatids, elongated spermatids, spermatozoa, Sertoli and Leydig cells, intertubular compartment, basement membrane, lumen, cellular debris, and tubular-intertubular compartment proportion. The total length of seminiferous tubules was also calculated (1). Sertoli cells were immunohistochemically marked (Monoclonal Mouse Anti-Vimentin Clone 9, Dako, Carpinteria, CA, USA). Positively stained cells showed a golden dark brown 3,3′-diaminobenzidine tetrahydrochloride-H2O2 reaction product. The cells were counted in 20 sections of tubules for each testis. This study was approved by the Faculty Institutional Care and Animal Use Committee (IACUC, Number 129/09). Both groups (day 0 vs. day 60) were compared by Student’s t test (SPSS Inc, Chicago, IL, USA). P values < 0.05 were considered significant.

RESULTS: No significant differences (mean±SEM) between testes groups were found for any of the gross and microscopic parameters assessed (P> 0.1): testis weight (1.54±0.4 g vs.1.7±0.2 g), length (1.94±0.1 cm vs.1.92±0.8 cm) and width (1.04±0.1 cm vs.1.04±0.1 cm), volume (0.95±0.1 cm3 vs. 0.95±0.1 cm3), gonadosomatic index (0.03±0.01 % vs. 0.04±0.01 %), maximum (240.5±29.8 vs. 250.8±18.6), minimum (166.6 ± 24.4 vs.194.1 ± 13.1) and medium (202.6±26.2 vs. 220.9±14.9) tubular diameters, major (240.9±29.1 µm vs. 247.5±18.3 µm) and minor (171.8±24.7 µm vs. 200.4±12.6 µm) tubular axes, area (35356.2±8482.8 µm2 vs.39622.9±5193.4 µm2) and tubular perimeter (668.1±84.8 µm vs. 718.7±47.7µm), germinal epithelium height (58.6±7.5 µm vs. 55.3±5.3µm), spermatoagonias (0.056±0.1 cm3 vs. 0.052±0.1cm3), primary spermatocytes (0.10±0.1 cm 3 vs. 0.052±0.1 cm3), secondary spermatocytes (0.003±0.001 cm 3 vs. 0.002±0.01 cm 3), round spermatids (0.12 ±0.1 cm3 vs. 0.13±0.01 cm 3), elongated spermatids (0.07±0.01 cm 3 vs. 0.066±0.01 cm 3), spermatozoa (0.04±0.01 cm 3 vs. 0.03±0.01 cm 3), Sertoli cells (0.064±0.01 cm3 vs. 0.072±0.01 cm3), Leydig cells (0.04±0.01 cm 3 vs. 0.04±0.01 cm 3), intertubular compartment (0.12±0.02 cm 3 vs. 0.12±0.02 cm 3), lumen (0.2±0.04 cm 3 vs. 0.3±0.03 cm 3), cellular debris (0.02±0.01 cm 3 vs. 0.01±0.01 cm 3), tubular-intertubular compartment proportion (7.17±1.2 vs. 7.29±1.3), basement membrane (0.02±0.01 cm2 vs. 0.02±0.01 cm2), total tubular length (38.73±10.5 m vs. 32.66±6.2 m) and Sertoli cells per seminiferous tubule (27.7±1.8 vs. 27.7±1.8).

CONCLUSION: According to these biometric and morphometric results, adult cats, the same that mice (2) and rats (3), do not develop compensatory hypertrophy after unilateral orchidectomy.