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Cytological Study of Normal Canine Testis from Birth to Maturity
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Testicular fine needle aspiration (FNA) is a simple and minimally invasive procedure\(^1\), which enables assessment of cytological parameters of the epithelium of seminiferous tubules\(^2\). However, there is no available information regarding normal cytological features of canine testes from birth to reproductive maturity of animals. Objective of the study was to evaluate the efficacy of testicular FNA for identification of the various testicular cells and cell indices, as well as their correlation with results of semen evaluation and histological features of the testis. Fifteen healthy medium-size male dogs with no testicular disorders were included into the study. Semen evaluation and testicular FNA (in both testes) were performed at fortnightly intervals from 4 weeks until orchectomy, which was performed in one animal at the time on each of 4\(^{th}\), 8\(^{th}\), 16\(^{th}\), 20\(^{th}\), 24\(^{th}\), 28\(^{th}\), 30\(^{th}\), 32\(^{nd}\), 34\(^{th}\), 36\(^{th}\), 38\(^{th}\), 40\(^{th}\), 44\(^{th}\), 48\(^{th}\) and 52\(^{nd}\) weeks after birth. In semen samples, volume of ejaculate, motility, viability, concentration and morphology of spermatozoa and presence of non-spermatozoal round cells were assessed and recorded. Testicular FNA was performed by inserting a 21 G needle connected to a 5 mL syringe, into the testicular parenchyma opposite to the epididymis. The aspirate was flushed onto a glass slide and stained with Hemacolor stain. At least 200 consecutive cells were counted in each smear and classified as follows: Sertoli cells, spermatogonia, spermatocytes, round spermatids, elongated spermatids and spermatozoa; differential counts were performed. Testicular cytological indices were also determined (Sertoli cell index, spermatic index, sperm-Sertoli cell index). Testicular tissue samples obtained in orchectomy were fixed in Davidson’s fixative solution, for processing by standard techniques. Histological examination and morphometric evaluation were performed. Diameter of seminiferous tubules and of lumen and height of seminiferous epithelium were recorded. Ejaculates were first collected on the 28\(^{th}\) week of life and spermatozoa were seen therein on the 30\(^{th}\). Semen samples with total sperm count >200×10\(^{6}\) were collected from 36\(^{th}\) week of life onwards. In FNA samples collected during the first 20 weeks of life, only Sertoli cells and spermatogonia were seen; spermatocytes were found from 22\(^{nd}\) week of life (5.0%, reaching 7.7% on 26\(^{th}\) week), round spermatids from 28\(^{th}\) week (9.0%, reaching 34.7% on 32\(^{nd}\)), elongated spermatids from 30\(^{th}\) week (2.2%, reaching 14.9% on 38\(^{th}\)) and spermatozoa from 32\(^{nd}\) week (3.0%, reaching 40.6% on 38\(^{th}\)). Histological examinations confirmed the cytological findings. Mean diameter of seminiferous tubule was 62.5 μm on the 4\(^{th}\) week and reached 75 μm at the 16\(^{th}\) week. In that time period, no lumen was visible and only Sertoli cells and spermatogonia were found. Spermatocytes were first noticed on the 20\(^{th}\) week. Lumen was formed on the 28\(^{th}\) week, when diameter of seminiferous tubules diameter had reached 122.5 μm and spermatids were first seen. Spermatozoa were first seen on the 30\(^{th}\) week and increased in numbers on the 34\(^{th}\) and thereafter. The results of the study will assist in interpretation of testicular cytological findings, especially in immature dogs, and will support investigations in onset of reproductive activity, particularly in dogs, in which semen examination is not feasible.
