Leydig cell tumor in ovary of a German Shepherd bitch: An immunohistopathological study

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Abstract

Leydig cell tumor as a sex-cord stromal tumor is a relatively uncommon ovarian tumor in bitch. A 10-year-old female German Shepherd dog was presented because of protrusion of a large tumor-like mass of 16 × 14 × 7 cm in dimensions from her vagina. After stabilization of the patient, the mass was removed surgically and concurrent ovariohysterectomy was also performed. Macroscopically, the healthy tissue of the right ovary was totally replaced by a homogeneous, brown and firm mass. The neoplasm was well-circumscribed and nodular and it was clearly demarcated from the healthy tissue. Histological examination revealed the presence of solid sheets and acinar structures composed of polyhedral to elongated cells. The neoplastic cells had large, eosinophilic, and vacuolated cytoplasms with round to oval nuclei and expressed vimentin on immunohistochemical examination. These gross, microscopic and immunohistochemical features are characteristics of ovarian Leydig cell tumor.

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Key words: Dog, Immunohistopathology, Leydig cell tumor, Ovary
Introduction

Ovarian tumors are relatively uncommon in bitch. Their frequency ranges between 0.5 and 1.2% with an average of 1.0%, but their incidence is probably underestimated. According to the world health organization, the ovarian tumors can histologically be classified as granulose theca cell stromal tumor, Sertoli-stromal cell tumor, sex cord tumor with annular tubules, gynandroblastoma, unclassified and steroid cell tumors. The Sertoli-stromal cell tumor consists of Sertoli-Leydig cell tumors, as well as pure Sertoli cell or pure Leydig cell tumors. Leydig cell tumors account for 15.0% to 20.0% of the steroid cell tumors in human. The Leydig cell tumors of the ovary are composed of cells resembling those of the corpus luteum in all species. These tumors consist of multiple lobules of neoplastic cells separated by a well-vascularized connective tissue stroma. The neoplastic cells are polygonal with abundant granular eosinophilic cytoplasm containing lipid vacuoles. The present report describes the histopathological and immunohistochemical features of a Leydig cell tumor in a German Shepherd bitch.

Case Description

A 10-year-old female German Shepherd dog was admitted due to protrusion of a large mass of 16 × 14 × 7 cm in dimensions (Fig. 1) from her vagina which resulted in severe depression, lethargy and anorexia. During clinical examinations, pale mucous membrane, tachycardia, tachypnea and distention of the bladder, probably due to compression of the urethra by the mass were detected. After stabilization of the patient the mass was removed surgically and concurrent ovariohysterectomy was also performed. On gross examination, the healthy tissue of the right ovary was totally replaced by a tumor like mass. The mass was brown, homogeneous, firm and elastic at palpation. It was well-circumscribed, nodular and clearly demarcated from the healthy ovary.

The appropriate tissues were fixed in 10% neutral buffered formalin, dehydrated in graded ethanol, cleared in xylene and embedded in paraffin wax. Sections of 5 µm thicknesses were stained with hematoxylin and eosin (H & E) and studied by a compound light microscope. Serial sections were subjected to immunohistochemistry with primary monoclonal antibodies specific for pancytokeratin, epithelial membrane antigen (EMA), S-100, inhibin, calretinin, synaptophysin, neuron-specific enolase (NSE), chromogranin and vimentin. All primary antibodies were from Novocastra Laboratories (Newcastle, UK). Labelling was detected with an avidin-biotin conjugate (ABC) procedure.

Histological examination revealed presence of the solid sheets and acinar structures composed of polyhedral to elongated cells. Broad bands of fibrovascular stroma divided the encapsulated neoplastic mass into lobules of different sizes and shapes. The neoplastic cells had large, eosinophilic, and vacuolated cytoplasmic vacuoles containing lipid vacuoles. The single or multiple clear vacuoles were of different sizes and optically empty (Fig. 3).

Fig. 1. Leydig cell tumor in a 10-year-old bitch. A large mass measuring 16 × 14 × 7 cm protruded from the vagina.

Fig. 2. Microscopic examination reveals presence of solid sheets and acinar structures of Leydig cell tumor with polyhedral to elongated, vacuolated cells (H & E, Bar: 125 µm).

Fig. 3. The neoplastic cells have eosinophilic and round to oval nuclei containing small nucleoli (H & E, Bar: 30 µm).

In some parts of the tumor, angiogenesis was prominent which at some instances resulted in small