NOTE *Surgery*

Ovarian and Retroperitoneal Teratomas in a Dog

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ABSTRACT. A 2-year-old female Labrador retriever was presented with anorexia and abdominal distention. Laparotomy revealed the presence of a 31-cm ovoid mass in the portion of the left ovary and an 11-cm round mass in the left retroperitoneal region. Both masses were surgically removed. Histopathological examination of the masses revealed a mixture of tissues characteristic of teratomas, such as multiple bronchial and intestinal cysts, hair follicles, sebaceous and apocrine sweat glands, and neuron tissue with intervening cartilage, bone and fat tissue. This paper appears to be the first report of primary retroperitoneal teratoma in the dog.

KEY WORDS: canine, retroperitoneal tumor, teratoma.

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Teratomas are neoplasmas composed of multiple tissues of ectodermal, mesodermal, and endodermal origin, in any combination, representing any organ, except the part in which they arise [1, 2, 5, 8–11]. In domestic animals, ovarian teratomas are rare, but have occurred, most frequently in the bitch and cow [1, 9]. However, no published report on retroperitoneal teratoma in the bitch has been made. In this paper, the clinical and pathological findings of ovarian and retroperitoneal teratomas in a dog are described.

A 2-year-old female Labrador retriever weighing 34.6 kg was presented with a recent onset of anorexia, distended abdomen and dry, non-productive cough. The left abdomen was distended with a large firm palpable abdominal mass. Left abdominal radiograms and ultrasonographs showed a large circumscribed mass with numerous irregular foci of calcification. Hematological parameters were within normal limits. Biochemical examination revealed slightly elevated serum alkaline phosphatase and alanine aminotransferase activities (358 and 63 IU/*l*, respectively). Exploratory laparotomy revealed the presence of a 31-cm ovoid mass in the left portion of the left ovary (Fig. 1A). In addition, another 11-cm round mass was found attached to the parietal wall in the retroperitoneal region, involving part of the left ureter (Fig. 1B). Both masses were removed, carefully separated from the surrounding tissue and ovariohysterectomy was performed on the bitch. The nongravid uterus and right ovary were normal. There were no additional abnormalities noted on an examination of the remaining abdominal organs and tissues.

The ovarian and retroperitoneal masses weighed 4.16 kg and 0.41 kg, respectively. The masses were encapsulated and had a slightly lobulated surface. On sectioning, a mixture of necrotic tissues, hemorrhages, and numerous cysts filled with hair was found (Fig. 2).

Microscopically, a wide variety of tissues from different germ layers, such as epithelium, brain, bone and cartilage were observed together with numerous cysts in these masses. Cystic spaces were lined by well-differentiated skin consisting of keratinizing, stratified, squamous epithelium, sebaceous glands and hair follicles. The desquamated skin with keratin and secretions from sebaceous glands were grouped together

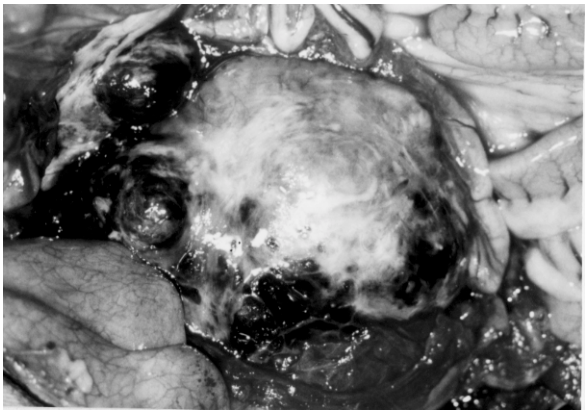

Fig. 1. Retroperitoneal mass (0.41 kg) found after ovarian mass has been removed.

Fig. 2. Cut surface of the ovarian mass containing multiple cysts filled with hairmatrix; Formalin-fixed specimen.

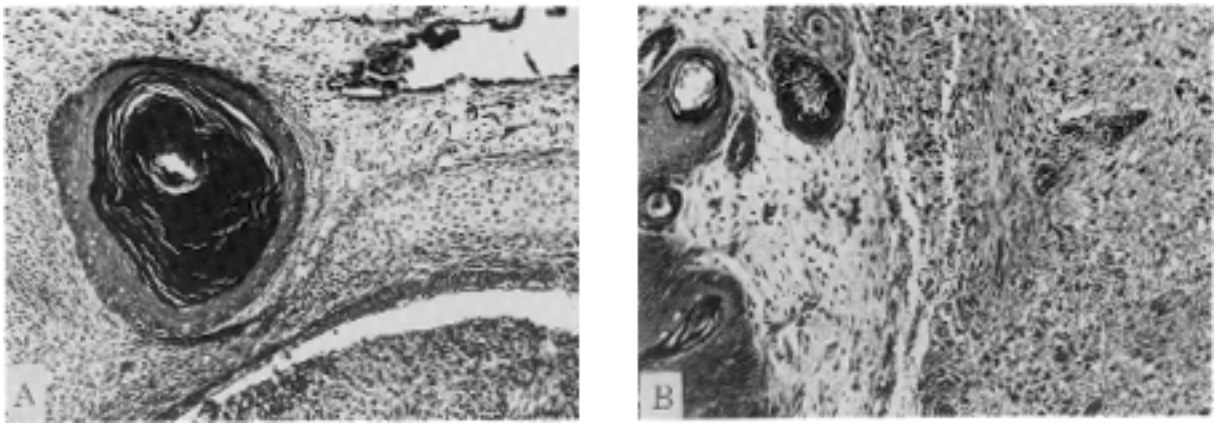

Fig. 3. A—Histologic section of retroperitoneal mass containing cysts lined by the keratinized squamous epithelium and the respiratory epithelium. HE stain. × 100. B—Same tumor as Fig. 3A, showing epithelial buds and hair follicles (left half) and nervous tissue (right half). HE stain. × 132.

with tangled masses of hair to fill the lumen of the cysts. Cavities lined by respiratory epithelium were often observed associated with cartilage. Other components present in the masses were smooth muscle, bone, fat, blood vessels, neurons, ganglion cells, and choroid plexus (Fig. 3). Intervening areas of undifferentiated mesenchymal tissue also existed.

On the basis of these morphological findings, both masses were considered as teratomas derived from the left ovary and the retroperitoneum, respectively. Teratomas are neoplasms containing recognizable mature or immature cells or tissues derived from more than one germ layer or sometimes all three, including bone, skin, nervous tissue, intestinal epithelium, muscle, hairs, and others [1–13, 16]. In general, teratomas take an origin from totipotential cells which are normally present in sequestered midline embryonic rests [14]. This type of teratoma arising from retroperitoneal tissue has not been reported in the dog, although canine teratomas occur most commonly in the ovary [4, 5, 7, 13, 16] and rarely in the intracranial tissue [12]. Canine ovarian teratomas are usually well-differentiated and benign and many of these have a significant dermal components [1]. In the present case, any intraabdominal or peripheral lymph nodes were not enlarged and no additional masses were associated with the abdominal viscera or the abdominal wall. Both ovarian and retroperitoneal teratomas were composed of mature three germ layers with an abundant dermal component, showing no apparent signs of malignancy histologically. In addition, the dog has not clinically shown any recurrences of the tumor for 1 year or more after the surgical removal. Therefore, the present case of teratomas was regarded as benign.

Metastasis occurs in malignant teratoma, and the metastatic sites have included abdominal viscera, lymph nodes, bone, and lungs [10]. It has been reported in metastasizing ovarian teratocarcinoma in dogs that the metastatic lesions were more bizzare than those of the primary and with hardly any resemblance to the primary, and only the sarcomatous element was seen in the local metastasis [3, 4, 13, 15]. In the present case, the histologic appearance of the ovarian and retroperitoneal teratomas, which were located separately, was similar with multiple tissues from three germ layers. Taking these facts into consideration, it is probable that these two teratomas occurred individually from totipotential germ cells in the ovary and retroperitoneal wall.

Primary retroperitoneal teratoma in animals other than man appears to have been reported previously in the rat [6], and the tumor is composed of various tissues derived from the three embryonic germ layers, which is similar to the retroperitoneal teratoma in the present dog. This appears to be the first report of such a tumor in the dog.

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