Case Report

Endometrial Polyps in a Cat

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Abstract: Endometrial polyps from an 11-year-old female nulliparous mongrel cat are described. Pedunculated polypoid masses consisting mainly of endometrial glands and stroma protruded into the lumen of the uterus. The endometrial glands were distributed in a haphazard low density pattern, while the stromal cells were distributed with various consistency. Throughout the polyps, mild to moderate proliferation of the connective tissue with admixed small blood vessels was observed, with some of these blood vessels exhibiting thickened walls. The perivascular stromal element was also observed in polyps, as an incidental microscopic finding. It was characterized by multiple perivascular whorl-like arrangements of spindle shaped cells. They were immunohistochemically positive for alpha-smooth muscle actin, desmin, and S-100. These elements appear to originate from the endometrial stromal cells through smooth muscle metaplasia. (*J Toxicol Pathol* 2003; **16**: 109–112)

Key words: cat, endometrium, polyp, uterus, smooth muscle metaplasia

Endometrial polyps in cats are a rare disease condition, with much of the available evidence being anecdotal¹. More details have been provided in only one report of 14 cats from the archives of the International Registry of Reproductive Pathology at the University of Illinois².

An 11-year-old female nulliparous mongrel cat was presented to the Veterinary Teaching Hospital of Azabu University with an approximately two week history of hemorrhagic vaginal discharge. Under the clinical diagnosis of uterine disorders, including pyometra, ovariohysterectomy was performed. The excised ovaries and uterus were submitted for histopathology. The cat was well, with no evidence of disease for more than two years following surgery.

Grossly, when both uterine horns were incised, multiple pedunculated polypoid masses protruded into the uterine cavity. The masses had a coarsely nodular surface, and the cut surface had a whitish appearance associated with some cysts. The larger masses were located close to the cervix, but did not prolapse into the vagina. The right uterine horn had two larger masses of $1.5 \times 1.2 \times 4.0$ cm and $2.0 \times 2.4 \times 2.6$ cm and the left uterine horn had also two larger masses of $1.2 \times 1.9 \times 2.6$ cm and $1.4 \times 2.2 \times 3.6$ cm, respectively (Fig. 1).

There were no gross abnormalities in both ovaries.

Microscopically, the surface of the polypoid mass was covered with a simple cuboidal to columnar epithelium continuous with the adjacent endometrial lining epithelium. The mass consisted mainly of various numbers of endometrial glands and stroma composed of spindle shaped cells with variable amounts of collagen fibers (Fig. 2). Endometrial glands were of various sizes and shapes, some of which were cystic with a small amount of amphophilic and amorphous material. Irregular outlines and multiple evaginations were also observed. They distributed haphazardly with low density throughout the polyps. The lining of the glands was a simple cuboidal to columnar epithelium, but some of these were attenuated, especially when the glands formed cystic. In general, the glandular epithelial cells had a basilarly located nucleus and moderate amounts of eosinophilic cytoplasm with few mitotic figures. In the stroma, the predominant cellular components were spindle shaped cells originating from the endometrial stromal cells. They were distributed with various consistency. Incidentally, there were multiple spindle shaped cells more compactly arranged around the blood vessels (perivascular whorled arrangement) (Fig. 3). They had closely packed oval-to-fusiform nuclei (high cellularity) with mild nuclear atypia and low mitotic activities. Throughout the polyps, there was a mild to moderate proliferation of connective tissue with admixed small blood vessels, some of which had thickened walls. In places, the polyp was edematous, but inflammatory reactions were not apparent. Adjacent endometrium showed mild dilatation of

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Fig. 1. Gross appearance of the excised polyps from the left uterine horn. Two larger masses of $1.2 \times 1.9 \times 2.6$ cm and $1.4 \times 2.2 \times 3.6$ cm projected from the endometrial surface. Their thin peduncles were apparent. The scale on the measure is 5 mm.

Fig. 2. Various numbers of endometrial glands and stromal cells among an areolar connective tissue. Some glands were cystic (HE), $\times 140$.

Fig. 3. Compactly arranged spindle shaped cells around the thick-walled blood vessels (perivascular whorled arrangement) (HE), $\times 500$.

the endometrial glands.

Immunohistochemical studies were performed on formalin-fixed paraffin embedded tissues. The perivascular spindle cells arranged in a whorled fashion were positive for anti-human alpha-smooth muscle actin (prediluted, monoclonal, Nichirei, Japan), anti-bovine S-100A (prediluted, polyclonal, Dako, U.S.A.), and anti-human desmin (1:20, monoclonal, Nichirei, Japan). The anti-human alpha-smooth muscle actin showed positivity in the cytoplasm (Fig. 4), and the S-100 staining showed positive immunoreactivity both in the nucleus and cytoplasm. The desmin staining showed dot-like positivity in the cytoplasm.

In the veterinary literature, board-based to pedunculated proliferative growths protruding into the uterine lumen in cats and dogs have been described as endometrial polyps³⁻⁶, hyperplastic endometrial polyps² or uterine stromal polyps (endometrial stromal polyps)⁷. The reported cases of endometrial polyps have been few^{1,2}, and the exact prevalence and prognosis of endometrial polyps in dogs and cats are unknown. In some veterinary references, they are described as rare lesions seen only in the bitch⁴, or occasionally occurring in the dog but exceedingly rare in cats³.

According to the nomenclature in the Histological Classification of Tumors of the Genital System of Domestic Animals⁵, we diagnosed the present case as endometrial polyps. However, its definition depends on the gross appearance and explanatory notes do not refer to the differential diagnosis between endometrial polyps and polypoid form of cystic endometrial hyperplasia. The histopathology between the two are different in domestic animals, but somewhat overlapping. Endometrial polyps are often associated with cystic endometrial polyps⁵. The more exact differences between true endometrial polyps and polypoid endometrial hyperplasia are defined as that endometrial polyps have a vascular connective tissue stalk³ or contain a substantial connective stroma in addition to glands, and are pedunculated⁴. This detailed definition supports our present diagnosis as endometrial polyps.

In comparison, similar uterine protruded lesions are more frequently recognized in rats and mice⁸. In rats, they are diagnosed as endometrial stromal polyp and are the most commonly reported uterine neoplasm^{8,9}. In the toxicologic pathology, endometrial stromal polyps are composed of abundant amounts of endometrial stromal cells often associated with large and distended endometrial glands¹⁰. Endometrial polyps, which are defined as benign nodular protrusions above the endometrial surface, consisting of irregularly distributed endometrial glands and stroma, are also among the most common pathologic lesions of the uterine corpus in women¹¹.

The perivascular stromal element showed immunohistochemical profiles of smooth muscle differentiation. It was positive for alpha-smooth muscle

Fig. 4. Immunostaining for alpha-smooth muscle actin. Positive immunoreactivity of perivascular spindle cells, $\times 500$.

actin. The cytoplasmic immunoreactivity for desmin was also clear, probably consistent with the presence of intermediate filaments. Variable amounts of smooth muscle may be seen in the stroma of the endometrial polyps in human beings¹¹. When the smooth muscle element is predominant, the lesions should be classified as adenomyosis in human pathology¹¹. In the present case, the perivascular stromal element appears to be originating from endometrial stromal cells through smooth muscle metaplasia (or differentiation) rather than genuine smooth muscle.

In women, the relationship of polyps to endometrial carcinomas is unclear¹¹. Polyps have been reported to occur in 12 to 34 percent of uteri containing endometrial carcinomas¹¹. In cats, there is no evidence that endometrial polyps are preneoplastic², although a 16-year-old cat with metastatic uterine carcinoma was also observed to have five endometrial polyps¹.

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