

Segmental aplasia of uterine body in an adult mixed breed dog

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Abstract. Segmental aplasia of the uterine body was diagnosed in a 5-year-old, mixed breed bitch. Abdominal radiography and transabdominal ultrasonography revealed marked dilation of fluid-filled uterine horns with no evidence of a uterine body. Sex hormone assays did not detect the presence of estradiol-17 β ; however, progesterone (2 ng/ml) was found in the serum, indicating anestrus. On gross examination of the reproductive tract, the uterine body was absent, apparently never formed. In its place, a cord-like piece of tissue was identified as an aplastic/dysplastic remnant, connecting the cervix and right uterine horn. The tip of the cord-like piece branched into 5 string-like pieces of tissue, 1 of which was connected to the region dividing the left and right uterine horns. Both the uterine horns were dilated markedly revealing hydrometra. Histologically, uterine body remnant tissues from the endometrium, myometrium, and perimetrium were detected in proximal and distal parts of the uterine body. The string-like piece of tissue connecting the uterine body remnant and the uterine horn consisted of a round cluster of smooth muscle cells surrounding a central core of adipose tissue with blood vessels. It was concluded that the hydrometra observed in both uterine horns was induced by an obstruction resulting from segmental aplasia in the uterine body. This is the first known report of segmental aplasia in the uterine body of a bitch.

Key words: Dogs; segmental aplasia; uterine body.

A pair of Müllerian (paramesonephric) ducts develops in the female reproductive system, including the fallopian tubes, and subsequently fuse to form the uterus, cervix, and upper part of the vagina.⁸ Nondevelopment or nonfusion (partial or complete) of the Müllerian ducts may result in a variety of anomalies, ranging from complete agenesis to duplication of the female reproductive organs.^{1,4,6} Developmental defects of the Müllerian duct system may cause segmental aplasia in various sections of the Müllerian system.^{1,4,6,8} This condition has been most extensively studied in cattle, where it is known as “White heifer disease.”³ In this species, portions of the uterine horns are missing, and the remainder is filled with mucin.

Although uterus unicornis and segmental aplasia affecting the uterine horns or vagina of the bitch is well documented,^{1,2,4,6,9} segmental aplasia of the uterine body has not yet been reported in the veterinary literature. This report documents segmental aplasia of the uterine body, resulting in bilateral hydrometra, in a 5-year-old, female, mixed breed dog.

A 2.6-kg, mixed breed bitch approximately 5 years of age with an enlarged abdomen was presented to the Chonnam National University Veterinary Teaching Hospital, South Korea. Clinical examination revealed that it was in good physical condition with no defects of the external genitalia except for pale mucus membranes. Abdominal radiography revealed 2 large blunt-ended tubular structures and a dis-

placement of most of the abdominal contents to the upper side. Transabdominal ultrasonographic examination revealed fluid-filled uterine body and uterine horns with no evidence of pregnancy. The left and right uterine horns were markedly distended to a maximum of about 6.5 and 5.0 cm, respectively, in diameter. Serum progesterone and estradiol-17 β were assayed using commercial kits.^a Estradiol-17 β was undetected, but the progesterone concentration in the serum was 2.0 ng/ml, indicating anestrus. Therefore, an ovariohysterectomy was performed to remove the ovaries and the entire genital tract down to the cervix.

Gross examination of the reproductive tract revealed aplasia of the uterine body and a marked bilateral dilation of the uterine horns (Fig. 1). There was a cord-like piece of tissue, approximately 6.4 cm long and a maximum width of 0.3 cm



Figure 1. Uterine body is aplastic. Cord-like tissue connects cervix and right uterine horn. Note uterine cervix (arrow). Bar = 3 cm.

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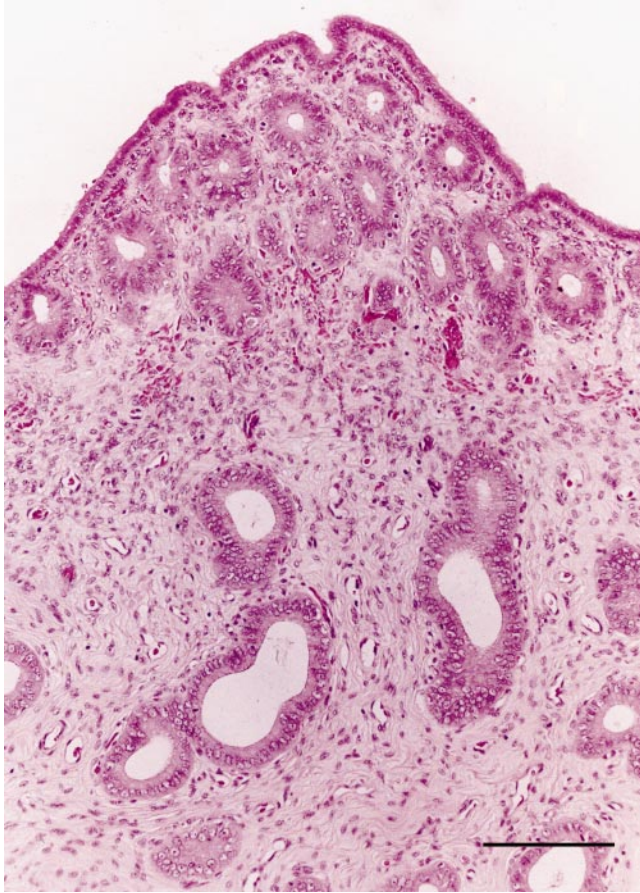


Figure 2. Uterine body tissues are observed behind the cervix. Considerable number of glands and interstitial fibrosis indicate that the endometrium is in the interface stage between diestrus and anestrus. HE. Bar = 320 μ m.

connected to the cervix and the right uterine horn, 6 cm from the region dividing the left and right uterine horns (Fig. 1). At this end point, the cord-like piece branched into 5 string-like pieces. One of these was connected to the region dividing the horns. Both uterine horns were markedly dilated, with a maximum dilatation of 6.7 and 5.3 cm in diameter at the base of the horns, which contained a watery, nonfetid, opaque, tan fluid of uniform consistency. This material was cultured to identify the presence of aerobic or anaerobic bacteria and was negative. The walls of both uterine horns were thin, and their mucosal surfaces revealed marked congestion. There was no communication between the right and left uterine horns. Both ovaries had small follicles with well-developed corpora lutea. The excised tissues were fixed in 10% neutral-buffered formalin, embedded in paraffin, sectioned, and stained with hematoxylin and eosin (HE).

Multiple cross sections of the uterus and ovaries were examined microscopically. Histologically, uterine body tissue containing endometrium, myometrium, and perimetrium was present in proximal and distal parts of the uterine body but only in very short lengths. In these regions, the endometrium of the uterine body appeared to be in the interface stage between diestrus and anestrus because the endometrium and its glands were well developed. The endometrium was lined



Figure 3. Round cluster of smooth muscle bundles replacing aplastic uterine body. HE. Bar = 1,250 μ m.

mainly by cuboidal epithelium (Fig. 2). The uterine horns were thin, atrophic, and lined mainly by cuboidal epithelium. There was marked congestion in the lamina propria. However, the endometrium at the distal region of the uterine horn just behind part of the uterine body and the ampulla and the infundibulum of the oviduct appeared to be in the interface stage between diestrus and anestrus. The string-like piece that branched out from the cord-like piece and ended at the dividing point of the horns was composed of peripheral smooth muscle bundles, encompassing blood vessels and adipose tissue (Fig. 3). Both ovaries were found to contain immature developing (primordial to secondary) follicles without Graafian follicles but with well-developed corpora lutea.

Although the uterine body was not detected by gross examination, histological examination revealed that uterine body tissue was detected in the cord-like piece of tissue. On the basis of the preceding observations, this case was diagnosed as segmental aplasia of the uterine body. Arrest in the development of the Müllerian duct system is of significance in cattle and swine.⁴ Aplasia of the uterus occurs mainly as segmental aplasia of the uterine horns in these animals but very rarely in bitches.^{4,9} Aplasia of the uterine body is rarely recorded in swine,¹⁰ and there are no reports of its occurrence in the other animals. Because either nondevelopment or nonfusion of the Müllerian ducts may result in partial or complete aplasia or duplication of the uterine body,^{1,4,6} respectively, segmental aplasia of the uterine body in this report might have been caused by partial nondevelopment of the Müllerian ducts.

Hydrometra and mucometra may result from the development of endometrial hyperplasia or an obstruction of the lumen of the uterus, cervix, or vagina.^{4,5} These 2 conditions are considered to be the same, the only difference being in the physical properties, which depend on the degree of hydration of the mucin.⁴ Because the luminal content of the uterine horns in this case was thin fluid, the term "hydrometra" was preferred to mucometra. On the basis of this

information, bilateral hydrometra of both uterine horns in this report was induced by an obstruction caused by segmental aplasia of the uterine body.

The segmental uterine horn or vagina are attached to the uterine body or remaining uterine horn either by a thick band of fibrous connective tissue,^{7,11} or by intermingled fibrous and smooth muscles,² respectively. In this case, a string-like piece extended from the cord-like piece and became attached to the point of division of the uterine horns. Interestingly, this string-like piece consisted of a round cluster of spindle cells and was therefore thought to be highly undeveloped rudimentary tissue of the uterine body. Alternatively, this tissue may be a part of a broad ligament because broad ligaments contain a considerable amount of smooth muscle.⁶ Gee et al.² described cyst-like structures on a transverse section of a segmental aplastic vagina, which could be evidence of incomplete canalization in the rudimentary tissues.

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Spontaneous aortic dissecting hematoma in two dogs

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Abstract. This report describes 2 cases of spontaneous aortic dissecting hematoma in young Border Collie and Border Collie crossbred dogs. Histology was performed in one of the cases involving an unusual splitting of the elastin present within the wall of the aorta, consistent with elastin dysplasia as described in Marfan syndrome in humans. The first case involved a young purebred Border Collie that died suddenly and the second case involved a Border Collie crossbred dog that died after a 1-month history of seizures. Gross lesions included pericardial tamponade with dissection of the ascending aorta in the former case and thoracic cavity hemorrhage, mediastinal hematoma, and aortic dissection in the latter. Histologic lesions in the case of the Border Collie crossbred dog included a dissecting hematoma of the ascending aorta with elastin dysplasia and right axillary arterial intimal proliferation.

Key words: Aortic dissection; elastin; fibrillin; Marfan syndrome.

Spontaneous aortic dissecting hematoma leading to aortic rupture is rare in the dog.^{2–4,12} In the absence of atherosclerosis, aortitis (sometimes associated with *Spirocerca lupi*⁶), degenerative processes, or congenital heart malformations, the cause is sometimes attributed to heritable defects in the

connective tissue components including elastin or collagen fibrils. The term aortic dissection or dissecting hematoma is preferred over dissecting aneurysm in these cases because there is no dilatation of the aortic wall as in a true aneurysm. This communication describes 2 similar cases of spontaneous aortic dissecting hematoma in relatively young dogs with Border Collie parentage. The underlying cause of the spontaneous aortic dissecting hematoma in these cases was not determined, but the histologic lesions in 1 of the cases was very similar to the elastin dysplasia that is observed in cases of human and bovine Marfan syndrome.^{1,5,7,8–11}

The first case was a 1-year-old purebred Border Collie

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