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Short communication

Cervical leiomyoma in a dairy cow during pregnancy

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Abstract

In the present report we describe a case of cervical leiomyoma that was diagnosed at parturition in a Holstein cow. The tumor mass, which measured 25.5 cm × 21.5 cm × 14.5 cm in size and weighed 4.5 kg, was removed surgically. The tumor was solid, well circumscribed, whitish-pink colored, and encapsulated. The tumor was diagnosed as leiomyoma. The leiomyoma had no adverse effects on pregnancy. This is the first report of a bovine cervical leiomyoma during parturition.
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1. Introduction

Tumors of the genital tubular tract are the most frequent in the uterus and vulva. There is a noteworthy rarity of cervical tumors in animals (Nielsen and Kennedy, 1990). Smooth muscle tumors of the tubular genitalia are common only in bitches and queens. They can develop anywhere in the tract, but most often develop in the vaginal wall. They appear to be, at least in part, hormonally dependent (Kennedy et al., 1998).

In the present report we describe a case of cervical leiomyoma in a Holstein cow whose diagnosis was established at the first stage of calving.

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Fig. 1. The appearance of the tumor on the cervix.

2. Materials and methods

A 7-year-old Holstein cow was presented to the veterinary obstetrics and gynecology clinics of the university of Yuzuncu Yil for evaluation of a huge mass protruding from the vulva. Upon referral, the rectal temperature, heart rate, and respiratory rate were within normal limits. Rectal palpation was performed for confirmation of pregnancy.

According to anamnesis, the mass started to hang down between the vulvar lips 36 h previously. A veterinary practitioner incorrectly diagnosed the prolapsed the mass as a vaginal prolapse. The current pregnancy was fifth and occurred after natural service. Although an artificial insemination technician detected the presence of a small cervical tumor four years previously, there was no problem in the previous calving.

Clinical examination disclosed that the mass was a pedunculated tumor arising from the portio vaginalis cervicis (Fig. 1). The origin of the tumor was identified as the cervix uteri because there is no connection to the vaginal wall. The cow showed prenatal accumulation of colostrum in the udder, slackening of the pelvic ligaments, edema of the vulva, and release of mucus plug in the cervix. Cervical dilatation allowed insertion of three fingers. These were accepted as signs of the first stage of calving.

Caudal epidural anesthesia was induced for surgical treatment by administration of 5 mL of 2% lidocaine. Following ligation of the stalk, the mass was surgically removed. The second period of calving could not come true because of inadequate dilatation of the cervix, and then caesarean section was performed. A male healthy calf weighing 40 kg was delivered. Since the cow was culled one month after surgery, no follow-up examination was done.

The tumor mass, which measured 25.5 cm × 21.5 cm × 14.5 cm in size and weighed 4.5 kg, was removed surgically. The tumor was solid, well circumscribed, whitish-pink colored, and encapsulated (Fig. 2). Tissues were fixed in 10% neutral-buffered formalin, paraffin-embedded, sectioned at 4 μm, processed according to routine procedures, and stained with hematoxylin and eosin, van Gieson's stain, and Masson's trichrome stain. Immunohistochemical staining was performed by the Avidin–biotin peroxidase complex (Dako, Carpenteria, CA, USA) method using



Fig. 2. The oblique section of the tumor.

primary antibodies to smooth muscle actin, cytokeratin, proliferating cell number antigen (PCNA), p53, S-100A6.

3. Results and discussion

Microscopically, the tumor tissue was composed of interlacing bundles of elongated strap-like cells, which tend to intersect at right angels rather than blend in curving bundles. Mitotic figures were rare. Pleomorphism and necrosis were absent. Immunohistochemically, almost all tumor cells were positive for smooth muscle actin (Fig. 3), whereas staining against S100, p53, PCNA, cytokeratin was negative. The histopathologic and immunohistochemical characteristics were helpful in differentiating between leiomyoma and other benign spindle-cell mesenchymal neoplasms, and a diagnosis of leiomyoma was made.

The incidence of genital leiomyoma is low in cattle. In an abattoir survey of more than one million cattle, 302 genital tumors were found, including five leiomyoma cases (Anderson and Sandison, 1969). Cervical leiomyoma has been reported in cattle (Jarearnkul et al., 2000), sheep (Marinov et al., 1983), and goat (Ramadan and Hassan, 1975; Cockcroft and McInnes, 1998), but its severe enlargement during pregnancy has not been recorded. Kennedy et al. (1998) stated that genital leiomyomas can grow to 10 cm in diameter.

Uterine leiomyomas can enlarge during pregnancy in humans (Parker, 2007). Estrogen has been reported to be one important risk factor for development of leiomyomas (Maruo et al., 2004). Leiomyomas are among the most common reproductive tumors reported in women and bitches, and are highly estrogen dependent in both species (Tamaya et al., 1985; Lopez et al., 1997). Therefore, these cells may be more responsive to the increased concentrations of estrogens present during pregnancy but we cannot explain the reason why the tumor became highly enlarged especially in the last pregnancy.

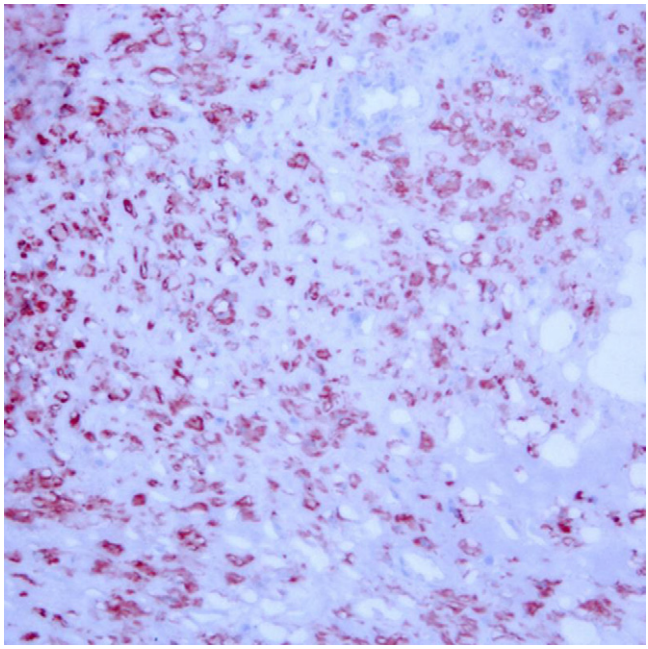


Fig. 3. The histopathological appearance of the tumor. There is smooth muscle actin immunoreactivity in the tumor cell cytoplasms. Avidin–biotin complex peroxidase method, (×200).

Tumors such as leiomyoma and fibroma can be confused with vaginal prolapse (Arthur et al., 1989). Genital neoplasms can impair artificial insemination attempts (Meyers and Read, 1990) and cause dystocia (Arthur et al., 1989). Likewise, the present neoplasm, which was diagnosed as vaginal prolapse, caused dystocia by impairing cervical dilatation. If the sacroiliac ligament and vulva had become fully slack at the first stage of labor, the tumor might have fallen out of the cervical mucosa. There were no adverse effects of the tumor on maintaining the pregnancy. To the best of our knowledge, this is the first report of a bovine cervical leiomyoma that became highly enlarged during pregnancy.

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