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Case Report

## Clinical Findings of The Coexistence of an Extraluminal Multiple Vaginal Leiomyoma with Ovarian Cystadenoma in a Dog

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#### ABSTRACT

In this report, we present a case of a dog diagnosed with both vaginal leiomyosarcoma and ovarian cystadenoma, occurring concurrently with perioperative clinical findings. A twelve-year-old intact Siberian Husky bitch was brought to our clinic due to constipation and urination difficulties attributed to a perineal mass that had been present for approximately one month. Although no tissue mass was visible protruding from the vagina, perineal swelling was remarkable, and the dog exhibited mild leucocytosis and anemia. Vaginal cytology showed densely keratinized superficial cells, indicating high oestrogen levels. Ultrasonography of the perineal and abdominal areas revealed a solid mass without internal blood flow and numerous cystic reflections in the left ovary. During surgery, after removing the two solid masses via episiotomy, an ovariohysterectomy was performed. Histopathological examination confirmed the diagnoses of vaginal leiomyosarcoma and ovarian cystadenoma. Following the operations, the patient regained normal urination and defecation and recovered without complications or recurrence. As a conclusion, this case report highlights the importance of considering concurrent reproductive tract tumours in geriatric bitches presenting with perineal swelling and urinary difficulties, emphasizing the need for thorough diagnostic evaluation and surgical intervention for successful management and recovery.

Keywords: Genital tumours, vagina, ovaries, female dogs.

# Bir Köpekte Eşzamanlı Görülen Ekstraluminal Vajinal Leiomyoma ve Ovaryan Kistadenomanın Klinik Bulguları

#### ÖZET

Bu raporda bir köpekte eşzamanlı olarak görülen vajinal leiomyosarkom ve ovaryan kistadenoma olgusuna ait perioperatif klinik bulgular sunulmuştur. Kısırlaştırılmamış 12 yaşlı Sibirya kurdu cinsi dişi köpek, yaklaşık bir aydır mevcut olan perineal kitleye bağlı kabızlık ve idrar yapma güçlüğü şikayetiyle kliniğimize getirildi. Vajinadan dışarı çıkan bir kitle görülmemesine rağmen, perineal şişlik belirgindi ve köpekte hafif lökositoz ile anemi tespit edildi. Vajinal sitolojide, yüksek östrojen düzeyine işaret eden yoğun keratinize süperfisiyal hücreler gözlendi. Perineal ve abdominal bölgenin ultrasonografik incelemesinde, damarlaşma içermeyen solid bir kitle ve sol ovaryumda çok sayıda kistik yapı tespit edildi. Operasyon sırasında, epizyotomi ile iki solid kitle çıkarıldıktan sonra ovariohisterektomi uygulandı. Histopatolojik inceleme sonucunda vajinal leiomyoma ve ovaryan kistadenoma tanılarını konuldu. Operasyon sonrası dönemde hasta, normal idrar ve dışkılama fonksiyonlarını yeniden kazandı ve herhangi bir komplikasyon veya nüks gelişmeden iyileşti. Sonuç olarak, bu olgu sunumu, perineal şişlik ve idrar yapma güçlüğü şikayetiyle gelen geriatrik dişi köpeklerde eşzamanlı üreme sistemi tümörlerinin göz önünde bulundurulmasının önemini vurgulamakta ve başarılı yönetim ve iyileşme için kapsamlı bir tanısal değerlendirme ile cerrahi müdahalenin gerekliliğini ortaya koymaktadır.

Anahtar kelimeler: Genital tümör, vajina, ovaryum, dişi köpek.

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#### Introduction

Canine vaginal tumours, which constitute approximately 2.4–3% of all neoplasms in dogs, are primarily leiomyomas. These tumours arise from smooth muscle cells and can potentially develop in any organ containing connective tissue or mesenchymal components (McEntee, 2002; James et al., 2012; Singh et al., 2014). They are typically characterized as non-invasive, slow-growing masses with no metastatic potential to other organs (Klein, 2007; Devereaux and Schoolmeester, 2019).

In contrast to the high incidence of vaginal tumours, ovarian tumours are very rare accounting for only 1.2% of all tumours identified in dogs. Another genital neoplasm observed in older bitches is cystadenoma, which originates from ovarian surface epithelial cells and has a higher prevalence among all ovarian tumours (40-50% of cases), usually detected unilaterally. Their growth is most commonly papillary or cystic, and they are generally progressive and asymptomatic (Schlafer and Miller, 2007; Carreira and Pires, 2016; White and Brearly, 2018). Due to the increase in ovarian size, these tumours are often incidental findings during routine spaying procedures, abdominal scans, or necropsies (Carreira and Pires, 2016).

The coexistence of reproductive tumours located in different portions of the genital system has been reported previously (Serin et al., 2006; Ozmen et al., 2008; Ferré-Dolcet et al., 2020; Brodzki et al., 2023). Some cases are more likely attributable to the coincidence of independent, age-related pathological processes. Nevertheless, many studies suggest that oestrogen-secreting tumours or ovarian follicular cysts may play a role in the pathogenesis of reproductive tract leiomyomas due to the high incidence of vaginal tumours in intact bitches. Researchers have described leiomyomas in dogs as hormone-dependent neoplasms that do not occur in spayed females (MacLachlan and Kennedy, 2002). Bitches spayed at an early age are not prone to developing leiomyomas, and in cases where leiomyomas are present, the condition tends to regress following spaying (Sathya and Linn, 2014; Dhoke et al., 2016).

In this report, we present the clinical, ultrasonographic, and histopathologic findings of coexistent vaginal leiomyoma and ovarian cystadenoma in a 12-year-old bitch, which was successfully treated with a combined surgery approach consisting of episiotomy and ovariohysterectomy.

#### Case

A 12-year-old Siberian Husky breed bitch with notable perineal swelling was referred to the Animal Hospital of the Aydın Adnan Menderes University, due to constipation and difficulty urinating for two weeks. In the patient's history, this painless swelling had been present for one month, but she had been experiencing issues with defecation and urination for the past two weeks.

Her body condition and appetite were reported as nor-

mal by the owners. In clinical parameters, her rectal temperature, pulse, and respiration were normal, and within healthy limits. The perineal area appeared enlarged. During the clinical examination of the rounded swelling, no ulceration or infectious lesions were found on its surface (Figure 1).

When performing a vaginal touche to explore the possible intraluminal findings, no mass formation or vaginal discharge was noticed, except for mild vulvar oedema. The vaginal cytology sample, stained with Giemsa stain, showed a significant estrogenic effect, with the dominance of the cornified and anuclear superficial epithelial cells. According to the owners, her proestrus bleeding was not as intense as before and lasted only a couple of days. No cyclic abnormalities related to prolonged estrus were recorded. Blood analysis revealed mild leucocytosis and anaemia (WBC:19.75×10<sup>3</sup> /µL; RBC: 4.54×19.75×10<sup>12</sup> /µL; HCT: 33%; PLT: 85).

After the clinical examination, B-mode and Doppler ultrasonographic assessments of her perineal area were performed. Initially, the imaging revealed a mass, allowing for differentiation between a perineal tumour, cyst, or hernia formation. Color Doppler imaging showed no detectable blood flow within the mass. Transdermal sonography revealed a solid mass without internal cyst or blood flow, well-encapsulated. Abdominal ultrasonography showed that the left ovary contained several cysts, with diameters exceeding 25 millimeters (Figure 2).

Surgery was performed under general anesthesia using xylazine [2 mg/kg of Xylazine HCL (Rompun %2, Bayer, Germany)] and ketamine [10 mg/kg of Ketamine HCL (Alfamine %10, Alfasan, Holland)]. First, the perineal tumour was removed via an episiotomy. Following urinary catheterization and aseptic preparation of the surgical site, an episiotomy incision was made on the tumour, with careful attention to the urinary meatus. Small haemorrhages were controlled with sealing and ligation. After incising the capsule of the swelling, two solid, firm, spherical masses were detected and easily removed without any hemorrhage (Figure 3).

They were fixed in 10% v/v formalin and sent immediately to a private pathology laboratory for histopathological examinations. The excision site was then closed. The soft tissues were sutured with USP 2/0 polyglactin 910 (Vicryl<sup>®</sup>, Ethicon, Netherlands), and the skin was closed with a 2/0 silk suture (Silk<sup>\*</sup>, Kruuse, Denmark). In the second part of the surgery, the routine ovariohysterectomy method was performed. Both ovaries and uterine horns were removed by ligation. Dressing of the sutures in both areas were performed with crystalline for a week. Systemic antibacterial injections with enrofloxacin (5 mg/kg) were prescribed for 7 days postoperatively. The owner reported that constipation began to improve 48 hours after the surgery. By the following week, the dog had recovered and did not develop postoperative complications. After 10 days, the bitch had fully recovered from the surgical wound, and a follow-up examination



Figure 1. Preoperative appearance of the perineal swelling



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Figure 2. Ultrasonography of left ovary showed increased ovarian size (calipers) and multicystic areas (a,b,c,d)



Figure 3. Excision of the fibrous tumour capsule (white arrows) after 2 months revealed no recurrence of the tumour.

Histopathological examinations revealed vaginal leiomyoma and ovarian cystadenoma (A-Pathology Laboratory; Protocol number: V207365-20). Two pieces of solid white material with regular borders (9 and 4 cm in diameter) were examined (Figure 4), All sections were



Figure 5. Cysts on the left ovary (white stars)



Figure 4. Solid and separate tumoural masses

composed of tumoural areas, with many sections showing tumour parenchyma consisting of well-differentiated cells with spindle-shaped oval nuclei, no atypia, and no mitosis. The cells were seen crossing each other in the bundles, without any signs of malignancy.

Yellow-brown ovarian material (38x3x2 cm) with a multicystic area measuring 3 cm in diameter (Figure 5) was also examined. The samples taken showed fibrocytic stroma, adenoid, and cystic papillary proliferations of varying diameters.The tumour cells were cuboidal, with well-differentiated euchromatic nuclei. Based on these histopathological findings, cystadenoma was diagnosed.

#### Discussion

In nulliparous bitches, the risk of neoplasms in the caudal genital system increases with age. Among vestibulovaginal tumours in dogs, leiomyomas are the most frequently reported, accounting for 80–90% of cases. and it has been confirmed that their growth is associated with several ovarian disorders, particularly those that result in high oestrogen levels (Yuefei et al., 2012; White and

#### Brearley, 2018).

Clinically, these masses are often described as well-encapsulated, single or multiple, painless swellings localized either intravaginally or extraluminally in the perineal region (White and Brearley, 2018). In certain cases, masses concealed beneath dense fur may remain undetected until they cause difficulty with urination or defecation. Consequently, a thorough perineal examination, including vaginal palpation, is recommended during annual clinical evaluations, particularly for older bitches (Saikia et al., 2018; Erdoğan, 2022).

Large intraluminal tumours may protrude through the vulva and, in some instances, extend cranially and caudally into the uterus and vagina (Dhoke et al., 2017). In contrast, extraluminal tumours are more commonly associated with perineal swelling, as observed in our case. In prolonged tumour cases, the growth of connective tissue leads to increased firmness. Additionally, large tumours can cause clinical complications such as bladder irritability, rectal pressure, tenesmus, and obstructed labour (Kang and Holmberg, 1983; Akkuş et al., 2016; Umamageswari et al., 2016). According to previous reports, defecation difficulties resulting from rectal pressure caused by the firm mass were observed in the present case.

In cases where a suspicious vaginal mass is identified, further diagnostic investigations are warranted to assess for concurrent ovarian abnormalities, which may contribute to the growth of vaginal tumours. Ovarian cysts and tumours, in particular, are frequently overlooked until they reach advanced stages and are often incidentally identified during routine spaying procedures (Carreira and Pires, 2016). Therefore, clinicians should conduct a thorough evaluation to investigate coexisting reproductive tract tumours in older females. Although some common symptoms of vaginal leiomyoma (such as recurrent vaginal secretions, prolonged proestrus bleeding, mate acceptance, or high serum estrogen results) were not in the present case, a remarkable estrogenic effect was detected in vaginal cytology. Additionally, abdominal scans revealed round, multiple cystic formations in the left ovary, and mild leucocytosis was recorded.

Ovarian tumours are typically detected in older, intact bitches, with an average age of onset ranging from 10.9 to 11.2 years (Feldman and Nelson, 2004). In the present case, the tumour was identified in a 12 years old bitch, aligning with previous observations.

Cystadenomas originate from the rete ovarii, generally affecting one ovary and, very rarely, both. They consist of multiple thin-walled cysts filled with transparent fluid (Herron, 1983). Epithelial neoplasms account for approximately 40–50% of all ovarian tumours and predominantly exhibit either a papillary (adenoma or adenocarcinoma) or cystic (adenoma or adenocarcinoma) growth pattern. Ovarian tumours are classified based on their ultrasonographic appearance as solid, solid with a cystic component, and cystic (Diez-Bru et al., 1998; Yotov et al., 2005). In this case, the ultrasonographic findings indicated a cystic pattern.

Ovarian diameters exceeding 25 millimeters and cystic anechoic areas are typical indications for spaying operations. In suspected ovarian abnormalities, the presence of cornified and anuclear superficial epithelial cells in vaginal cytological samples reflects the high serum uestrogen level (Root Kustritz et al., 2010). Periodic gynaecological examinations in older intact female dogs, including monitoring ovarian activity and measuring total ovarian dimensions, play a crucial role in the early diagnosis of various gynaecological pathologies (Erdoğan, 2022). Regarding the estrogenic stimulation caused by ovarian cysts in the development of vaginal leiomyomas, a combined approach of tumour excision and ovariohysterectomy was preferred to prevent the recurrence of vaginal leiomyomas. The primary treatment for vaginal leiomyomas involves surgical excision of the mass (Klein, 2007). In cases involving larger masses, an episiotomy may be necessary to facilitate proper removal (Rollon et al., 2008; Nelissen and White 2012). latrogenic damage to the urethra or accidental injury to other perineal structures is a potential surgical complication that can significantly impact the patient's quality of life. Therefore, preoperative urethral catheterization is recommended to minimize the risk of injury and improve surgical outcomes. The second surgical approach is spaying to prevent and control further tumour growth (McEntee, 2002; MacLachlan and Kennedy 2002; Yotov et al., 2005). In this case, guided by urethral catheterization, two extraluminally masses were successfully removed via episiotomy without any surgical complications. Based on ultrasonographic findings of the left ovary, ovariohysterectomy was performed as a secondary surgery to reduce the likelihood of similar tumoural growth. No mass recurrence or genital disorders were detected during the next six months postoperative follow-up.

#### Conclusion

In conclusion, this case report points out that perineal mass related to the genital tract can cause deteriorating daily functions, necessitating additional genital assessments for optimal surgical management, particularly in the presence of concurrent ovarian disorders. Although no cyclic disorder, vaginal discharge, or abdominal distension was observed, a definitive diagnosis was achieved through detailed abdominal ultrasonography and vaginal cytology. Based on these findings, the surgical management of vaginal leiomyoma in bitch should involve a combination of tumour resection and ovario-hysterectomy, with careful consideration to prevent tumour recurrence.

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#### Author contribution statement

Clinical Examinations and Surgery, Literature Search, Writing G.E.

#### **Conflict of interest**

The authors declare that they have no conflict of interest in this study.

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