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Successful management of bilateral cystic ovary associated with vaginal fibroma in intact geriatric bitches

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Abstract

Vaginal neoplasia was found to be the second most frequently diagnosed canine vaginal disorder. The present report explicates a rare case of follicular cyst associated with vaginal fibroma in bitches. A total of 6 mixed breeds of intact geriatric dogs ailing from caudal reproductive tract (CdRT) neoplasia were included in the study. The dogs were reported to have a 'pop out' sign i.e., vaginal mass protruding out of vulva. CdRT neoplasms may be associated with follicular cyst and endometrial hyperplasia, hence decided to ascertain the ovarian involvement by diagnostic approaches like serum estrogen level, calcium levels, ultrasonography, exploratory laparotomy and histopathology. Peritoneal (Abdominal seeding) and thoracic metastases were ruled out by radiography and peritoneal lavage respectively. Upon general clinical examination, normal physiological values were noted, along with the presence of hyperplastic tissue hanging from the vulva in the vagina. On vaginal examination, the mass's stalk that connected to the vaginal roof was spotted. For the purpose of treating the condition, surgical excision of the vaginal mass when combined with ovariohysterectomy was chosen. The projecting mass was surgically removed under general anaesthesia following urethral catheterization. Bilateral ovary with numerous pleomorphic follicles were discovered during an exploratory mid ventral celiotomy, and an ovariohysterectomy was performed in accordance with usual protocol. Histopathology validated the ovarian tissue's follicular cyst and the vaginal tissue's fibroma. Bitches underwent fluids and antibiotics for seven days as part of their post-operative care. Bitches made a full recovery and maintained a clinically normal state up till the report.

Keywords: Geriatric bitches, cystic ovary, vaginal fibroma, ovariohysterectomy

Introduction

Ovarian affections are uncommon in bitches (Ravikumar *et al.*, 2022 and Johnston *et al.*, 2001) [16, 8] but they may affect health, fertility or even the life of the animal. Cystic ovaries and ovarian tumors are the most common ovarian affections in the reproductive system (Dow, 1960; Johnston *et al.*, 2001 and McEntee, 1990) [4, 8, 12]. Ovarian cysts have greater clinical manifestation in bitches. Three different kinds of cysts exist: luteal cysts, cystic corpora lutea, and follicular cysts. On the ovarian surface, follicular cysts are fluid-filled, bilateral or unilateral formations of varying sizes that do not react to an atresia trigger. Follic cysts typically affect middle-aged to older adults (Johnston *et al.*, 2001) [8]. The mechanism's source suggests that it might result from a central inability to create enough gonadotropins, particularly LH, which is necessary for follicular development and ovulation (Knauf *et al.*, 2014) [10]. These excessive follicular fluids secrete more amount of estrogen, which may increase the blood supply to caudal reproductive tract, thus leading to caudal reproductive tract pathologies such as hyperplasia, tumor and etc. (Gopikrishnan *et al.*, 2021) [6].

Materials and Methods

Mixed breeds of geriatric bitches (n=6) were brought to the Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the history of pop out sign in the vulval region. Clinical examination revealed all the general parameters were within the normal range.

Examination of the external genitalia showed a single large, hard mass was protruding through the vaginal cavity. Further vaginal examination revealed that the mass was attached to the dorsal wall of the vagina in all the cases studied. To rule out the TVT, vaginal exfoliative cytology was performed and there was an absence of TVT cells. The ultrasonographic studies documented the presence of multiple sized follicles on both the ovaries. Radiographic examination confirmed the absence of pulmonary metastasis. The laboratory examination results revealed an increased serum estrogen (98.85 ± 8.74 pg/ml) and calcium level (14.90 ± 1.97 mg/dl).

With all the results of fore mentioned examination, the case was tentatively diagnosed as vaginal neoplasm. For confirmatory diagnosis, exploratory celiotomy was performed under general anaesthesia using diazepam (0.5 mg/kg i.v.) and ketamine (5 mg/kg i.v., for induction and 2.5 mg/kg i.v., for maintenance). Initially, after urinary catheterization the vaginal mass was removed after multiple tourniquets. Then mid-ventral celiotomy was performed for ovariohysterectomy. After ovariohysterectomy, sterile normal saline was infused into the peritoneal cavity and peritoneal lavage was collected and further centrifugation was done. The sediment was smeared and there was an absence of tumor cells in all the 6 cases which confirms the absence of abdominal seeding. Presence of multiple pleomorphic follicles notices on both ovaries in all the cases. Post-operatively the bitches were treated with fluids and antibiotics for a period of 7 days and all the bitches were recovered uneventfully. During the due course of post-operative recuperation period, hematological and biochemical indices were monitored to detect post-operative complications.

Results and Discussion

Histopathology of excised vaginal masses revealed a characteristic wavy, flattened spindle shaped fibroid cells with its nuclei at the center. This confirms the vaginal fibroma. The follicular cysts on histopathology shows a large cyst containing eosinophilic exudate with inflammatory cells lined by cuboidal cells. Since other cysts do not result in a clinical circumstances, follicular cysts are the primary target of therapeutic alternatives in veterinary medicine (Sontas *et al.*, 2011) [19]. In order to allow the granulosa cell layer in the cystic structure to recede later, by the end of the diestrus stage, treatment for follicular cysts is based on an attempt to luteinize it (Fayrer- Hosken *et al.*, 1992; Lopate and Foster, 2010) [5, 11]. Follicular cysts can be treated with 50 mcg of gonadotropin-releasing hormone (GnRH) or 500 IU of human chorionic gonadotropin (hCG). However, tamoxifen citrate and PGF 2α may lead to recurrence and resolution failure, respectively, if used (Olson *et al.*, 1989; Johnston *et al.*, 2001) [15, 8]. It has always been proposed that ovariohysterectomy will be curative in most cases when the clinical condition or hormonal therapy is ineffective (Jersens and Shaw, 1987). A laparotomy-based method known as ultrasound-guided aspiration may be used to extract cystic fluid from ovarian cysts as an additional therapeutic option (Fayrer- Hosken *et al.*, 1992) [5].

Tumors arising from the female reproductive tract of bitches may either originate from the tubular genital tract or from the ovaries (Barnett *et al.*, 2013) [1]. Vaginal tumors in combination with vulval tumors are the second most prevalent reproductive tumors in the canine population, next to mammary tumors (Noakes *et al.*, 2014) [14]. Before the commencement of treatment, it is pivotal to determine whether the tumor is benign or malignant. Moreover, such

tumors must be differentiated with other reproductive pathologies like hyperplasia, abscessation (Dey *et al.*, 2017) [2]. There are two types of fibromas: hard and soft. Hard fibromas are hard and firm. On cut section it is usually dry and white with adult fibrous connective tissue cells. While the soft fibromas appear as spongy, vascular, edematous and pedunculated with a small amount of collagen (Rizk *et al.*, 2015, Wykes, 1986) [17, 21]. These fibromas may be intraluminal or extraluminal. Large intraluminal tumors may protrude through the vulva giving pop out symptoms, While extraluminal tumors tend to cause perineal swelling which can be visualized using radiographic examinations (Umamageswari *et al.*, 2016) [20].

Ovarian cysts have great clinical relevance in older bitches, but they evolve silently and may remain undiagnosed for longer period of time without any clinical symptoms. Grossly in this study the ovaries were heterogenous with multiple pleomorphic follicles and cysts. There are two types of tumors, benign and malignant. There was an absence of malignancy in the present study. Malignant tumors are always life threatening and their removal before metastasis could be better for saving the life of an animal. The benign tumor present in the vagina and vulva usually have good prognosis (Jonna and Jane, 2001) [9]. The increased estrogen level is capable of stimulating endometrial and myometrial hyperplastic changes (Niskanen and Thrusfeld, 1988) [13]. The hormonal imbalance and the local growth factors are probably the cause for the pathologies in this case study.

The serum estrogen and calcium is used as a potential diagnostic and prognostic indicators for follicular cyst and vaginal fibroma respectively. The serum estrogen level was positively correlated with follicular cyst ($p < 0.01$) and the serum calcium level was positively correlated with vaginal fibroma ($p < 0.01$). Leiomyomas are the most common neoplasm of the vagina and vulva, fibromas being the second most frequently described (Barnett & Theilen, 1977) [1]. Hypercalcemia associated with fibroid was thought to be associated with the production of Parathyroid hormone-related protein (PTHrP). This PTHrP causes hypercalcemia by promoting bone resorption and decreasing calcium excretion (Dagdelen *et al.*, 2008) [3]. The cranial and caudal reproductive tract tumors are common in senile bitches owing to exaggerated hormonal stimulation in ovarian tumors/cysts, stimulates the proliferation of uterine and vaginal tissues. The caudal reproductive tract neoplasm need to be correlated with ovarian pathologies like cystic follicles and ovarian neoplasms (Salomon *et al.*, 2004) [18]. Hence, concluded that the surgical extirpation of mass along with ovariohysterectomy is the only option to prevent mortality in geriatric bitches and this is the complete approach for this condition.

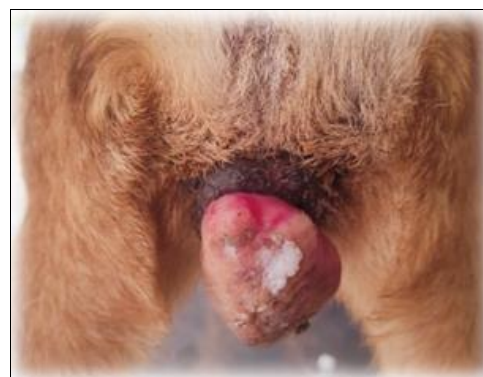


Fig 1: Dog with pop-out sign



Fig 2: Ultrasonographic image showing anechoic structures in the ovary



Fig 5: Surgical resection of vaginal mass



Fig 3: Radiographic image showing absence of pulmonary infiltration

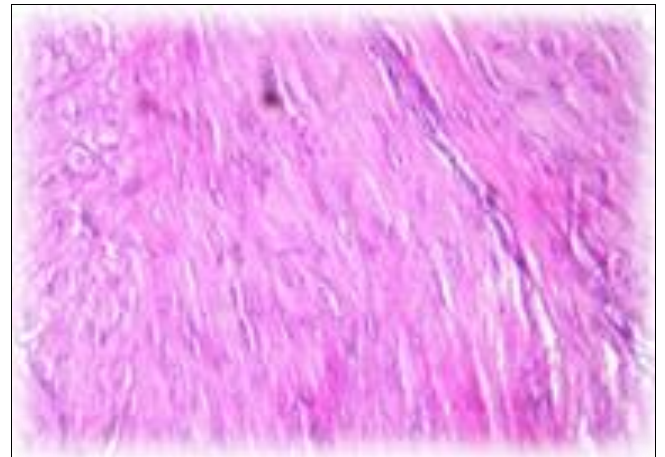


Fig 6: Histopathology of vaginal mass- Wavy like appearance of neoplastic cells contained flattened spindle shapes fibroid cells and nuclei in the centre confirms vaginal fibroma



Fig 4: Urinary catheterization

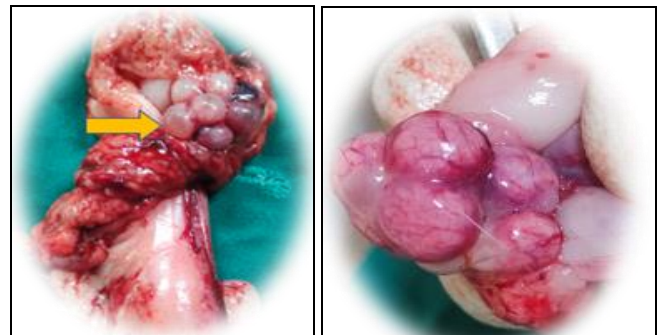


Fig 7: Images showing follicular cysts in the ovaries

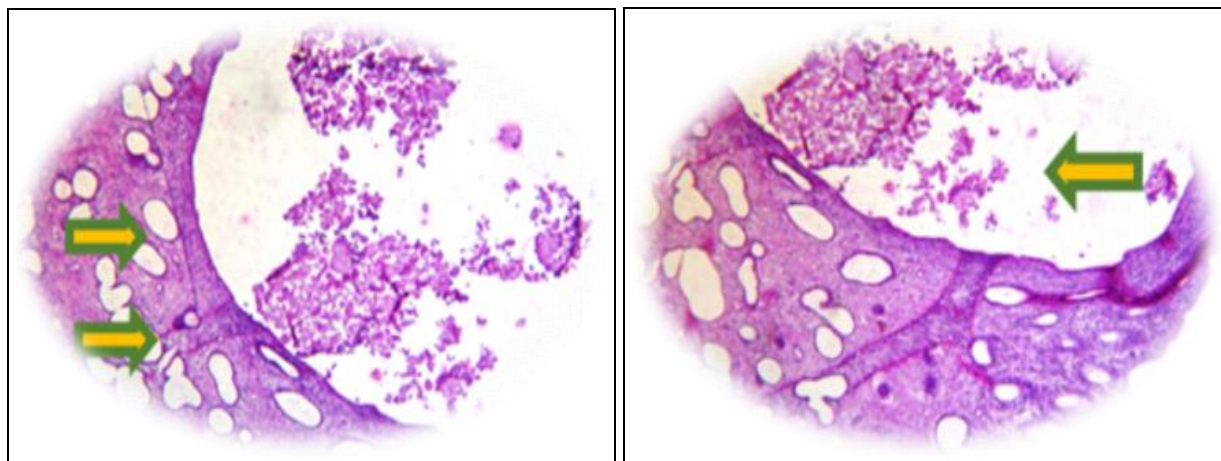


Fig 8: Histopathology of ovary- Ovarian stroma containing multiple cysts in stromal epithelium and a large cyst containing eosinophilic exudate with inflammatory cells lined by cuboidal cells

Conclusion

Tumors of CdRT are often associated with various ovarian pathologies; hence such multifocal diseases need to be corroborated by various diagnostic test before opting for cytoreductive surgery. Multiple diagnostic tests are intended to assess the inter tumor relationship within the reproductive tracts, such tumors often require certain complementary diagnostic tests to detect the pathophysiology of tumor expansion. All the diagnostic tests aimed at detection of ovarian pathologies need to be non-invasive or less invasive to prevent abdominal seeding. Non-invasive diagnostic tests like hormonal, biochemical and serum biomarkers needed to be standardized, however exploratory laparotomy and histopathology remains the gold standard diagnostic technique for ovarian pathologies. Following surgical removal of diseased uterus and ovaries, certain hematological and biochemical indices need to be monitored to increase the odds of recovery.

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