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Cystic adenocarcinoma associated with vaginal fibroma in a bitch

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Abstract
Vaginal neoplasms are the most common reproductive disorders in dogs that are rarely associated with the ovarian neoplasms. The present report explicates a rare case of cystic adenocarcinoma associated with vaginal fibroma in a bitch. A nine year old nulliparous intact Spitz bitch was presented with a history of periodic discharge from vulva and hard mass protruding from vaginal canal since 1 month with regular micturition and defecation behaviors. General clinical examination revealed normal physiological values and presence of vaginal hyperplastic tissue hanging from the vulva. Per vaginal examination revealed the stalk of the mass attached to roof of the vagina. Hence, surgical resection of the vaginal mass combined with ovariohysterectomy was opted for the correction of the condition. Under general anesthesia, after urethral catheterization the protruding mass was surgically removed after applying multiple tourniquets at the base of the vaginal mass. Exploratory mid ventral celiotomy revealed bilateral ovarian masses with multiple pleomorphic follicles and ovariohysterectomy was done as per standard procedure. Histopathology confirmed cystic adenocarcinoma of the ovarian tissue and fibroma of the vaginal tissue. Animal was administered with fluids, antibiotic, anti-inflammatory as a post-operative management for 5 days. Animal recovered uneventfully and remained clinically normal without evidence of metastasis till report.

Keywords: Ovarian cystic adenocarcinoma, vaginal fibroma, bitch and ovariohysterectomy

Introduction
An ovarian tumor is a type of tumor that develops from the uncontrolled disordered growth of cells found in the ovary. The ovarian neoplasms in dogs and cats are often undiagnosed during regular clinical examinations by palpation of abdomen and ultrasonography or radiography (Gopikrishnan *et al*., 2021) [4] and they may be malignant or benign. The cells of the ovary contain germ cells and epithelial cells. Ovarian tumours were classified into four types epithelial tumours, germ cell tumours, specialized ovarian stromal cell tumours and mesenchymal tumours (Solango-Gallego and Masserdotti, 2016) [14] of which epithelial tumours were the most frequently reported. Epithelial tumors are frequent in dogs and represent 40-50% of all ovarian neoplasms (O'Keefe, 1995) [9] and among them adenocarcinomas represent 64%, of which metastasis occurs in 50% of the cases (Patnaik and Greenlee, 1987) [10]. The more common malignant ovarian tumors include teratoma, carcinoma and adenocarcinoma. Tumors of the vagina and vulva are the second most common form of reproductive tumors next to mammary tumor in canine (Saahithya *et al*., 2018) [12] which may be either benign or malignant. Mesenchymal origin of canine vaginal tumors is rare and mainly of fibroma and fibrosarcoma (Neelu and Tiwari, 2009) [7]. Nulliparous dogs with mean age of 10-11 years are at risk of benign mesenchymal tumors especially fibroma and leiomyoma, whereas lipoma is common in younger dogs (James FZ *et al*., 2012) [5]. The present report explains and discusses the clinical signs, surgical, pathological findings and the therapy of a bilateral ovarian cystic adenocarcinoma associated with vaginal fibroma in a nine year old bitch.

Case history and observations
A nine year old nulliparous intact Spitz bitch was presented to the Small Animal Gynaecology and Obstetrics Unit, Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the history of periodic discharge from the vulva and hard mass protruding from the vaginal canal since one month. The last estrum was noticed two months back and the bitch had a history of regular micturition and defecation.

Examination of external genitalia revealed large single hard mass protruding through with vaginal canal attached to the roof of the vagina with the serosanguineous discharge. General clinical examination revealed all the physiological parameters were within the normal range and haemato-biochemical evaluation revealed leukocytosis with neutrophilia. Impression smear revealed negative for transmissible venereal tumour.

Fig 1: A nine-year-old nulliparous intact Spitz bitch having vaginal mass

Treatment

Surgical resection of the vaginal mass combined with ovario-hysterectomy was opted for the correction of the condition owing to the age of the dog and on owner's request. The bitch was pre-medicated with atropine sulphate at 0.02 mg/kg subcutaneously and xylazine hydrochloride at 1 mg/kg intramuscularly.

Urethral catheterization was done to retain the patency of the urethra. Anaesthesia was induced with diazepam 0.5 mg/kg intravenously and ketamine 5 mg/kg intravenously and maintained with ketamine at 2.5mg/kg intravenously. After placing the bitch in sternal recumbency, multiple torniquets were applied at the base/ stalk of the vaginal mass in an alternate manner and the mass was resected. The mucosal edges were opposed by cross mattress suture pattern using chromic catgut size number 1-0.

Fig 2: Multiple tourniquets at the base of the mass by alternative fashion

Fig 3: Resected vaginal mass

Exploratory celiotomy by mid ventral approach revealed bilateral ovarian masses with multiple pleomorphic follicles. The ovariohysterectomy was performed by ligating and transfixing ovarian arterio-venous complexes using No. 1 chromic catgut to prevent slipping of ligation. Portion of broad ligament was ligated using No.1 chromic catgut. This procedure was repeated on the left side of the ovary and uterus also. Body of the uterus was ligated using No. 1 chromic catgut and the ligation was transfixed and the uterine body was severed from the cervix.

Fig 4: Ovarian arterio-venous complex was ligated using No.1 chromic catgut and transfixed to prevent slipping of ligation

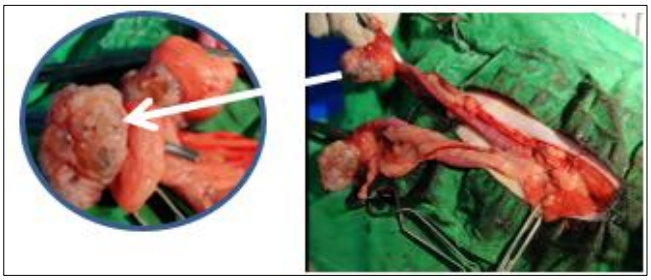

Fig 5: Body of uterus was ligated using No. 1 chromic catgut and the ligation was transfixed

The abdominal incision was closed by continuous interlocking suture pattern using polyglycolic acid size No.1. Subcutaneous and subcuticular sutures were done by continuous pattern using chromic catgut size No. 1-0. Skin incision was closed by cross mattress pattern using sterile cotton thread. The animal was treated with Inj. Ringer's lactate at 10ml/kg IV., Inj. Dextrose Normal Saline 10 ml/per kg IV., Inj. Pantoprazole 1 mg/ kg IV., and Inj. Ceftriaxone 20mg/kg IV., Inj. Tramadol 2 mg/kg subcutaneously on the

day of surgery. Antibiotics and fluids were followed for 5 days and the animal recovered uneventfully. On 10th postoperative day that sutures were removed.

Histological findings

The histopathology of ovarian tissue revealed multiple cysts containing eosinophilic secretions surrounded by acinar pattern of neoplastic cells suggestive of cystic adeno-carcinonma.

The histopathology of vaginal tissue revealed wavy like appearance of neoplastic cells contained flattened nuclei in the centre of the cell suggestive of fibroma. The uterine horns revealed normal histological patterns. Based on the histopathology findings, the case was diagnosed as cystic adenocarcinoma associated with vaginal fibroma.

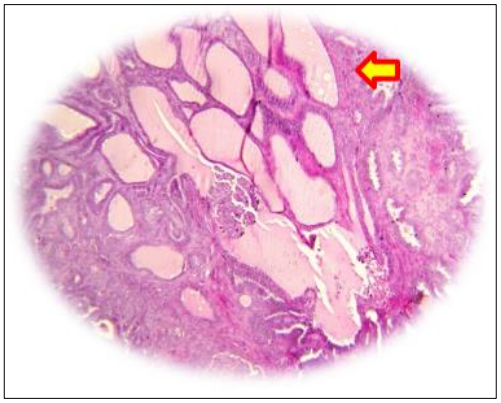

Fig 6: Ovarian tissue- Multiple cyst containing eosinophilic secretions surrounded by neoplastic cells

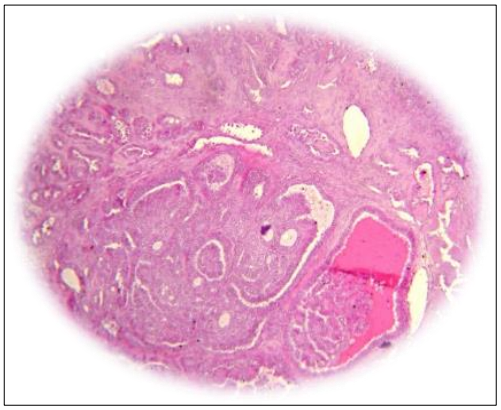

Fig 7: Ovarian tissue- Cyst with eosinophilic secretions and acinar pattern of neoplastic cells

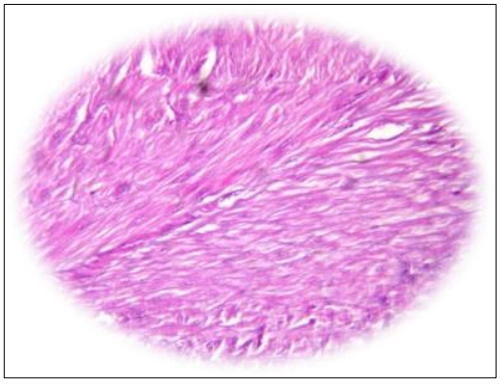

Fig 8: Vaginal tissue- Wavy like appearance of neoplastic cells contained flattened nuclei in the centre of cell

Discussion

Ovarian tumours are of rare occurrence in dogs and diagnosed accidentally during routine ovariohysterectomy and not by regular clinical examination or ultrasonography and radiology (Gopikrishnan *et al*., 2021) [4]. Ovarian tumours are often associated with vaginal discharge, alopecia, enlarged vulva, pyometra, cystic endometrial hyperplasia and irregular oestrus (Zanghi *et al*., 2007) [16]. Grossly the ovaries in the present case were heterogeneous and irregular with pleomorphic follicles and cysts. Ovarian tumours are of two types benign and malignant of which benign tumours are of common occurrence. Malignant tumours are always life threatening and their early removal or treatment before metastasis could be the better option in saving the life of the animal.

Ovarian adenocarcinomas produce both oestrogen and progesterone which play a role in the development of cystic endometrial hyperplasia and subsequent pyometra and are capable of stimulating endometrial and myometrial proliferative changes (Niskanen and Thrusfeld, 1998) [8]. In the present case, hormonal imbalance together with local growth factor seemed to be the most probable cause for the development of the tumour.

Tumors of female genital system in bitch occur most frequently in the vagina and vulva and are usually benign and carry a good prognosis (Joanna and Jane, 2001) [6]. Mesenchymal tumours such as leiomyoma, fibroma or fibroleiomyoma are most common in the bitch and are slow-growing, non-invasive and smooth muscle derived masses which do not cause metastasis (Devereaux and School meester, 2019) [3]. Benign vaginal tumors are always associated with estrogen production and such tumors rarely occur in spayed bitches or administered with estrogen therapeutically (AL-Kenanny *et al*., 2013) [2]. Benign vaginal tumors present as slow growing perineal masses protruding through the vulval lips especially when the animal strains or is in estrus which are traumatized and secondarily infected.

Treatment approach of vaginal fibroma ranged from medical therapy with aglepristone (Rollon *et al*., 2008) [11] to complete removal of the mass by episiotomy (Ali *et al*., 2019) [1] or more aggressive procedure such as vaginectomy, urethroplasty and ventral pelvic osteotomy (Salomon *et al*., 2004) [13]. Since most vaginal and vulvar tumors are benign surgical resection combined with ovariohysterectomy carries a good prognosis (AL-Kenanny *et al*., 2013: Verma *et al*., 2019) [2, 15]. Vaginal tumour in the present case was diagnosed as fibroma which might be due to the ovarian cystadenocarcinoma which acted as persistent hormonal source. The findings of the study are in accordance with (Salomon *et al*., 2004) [13] who described that caudal reproductive neoplasm should be correlated with the ovarian pathologies *viz*., cystic follicles and ovarian neoplasm.

Hence concluded that, vaginal tumours in bitches should be correlated with ovarian tumours either benign or malignant and surgical excision combined with ovariohysterectomy is the complete treatment approach for the condition.

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