

Management of cystic ovarian follicular disease in a bitch- A case report

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Abstract

A 6-year-old Spitz bitch was presented with complain of progressive longer period of vaginal bleeding for more than one month and non-pruritic bilaterally symmetrical alopecia of the perineal region. Hematological examination showed hemoglobin (Hb) at 8.8 gm/dL, total leucocyte count (TLC) at 34000/ μ L with neutrophil 78%. Vaginal cytology indicated presence of cornified vaginal epithelium cells indicative of elevated serum estrogen concentration. Ultrasonographic examination of ovary revealed presence of focal hypo-echoic to anechoic cystic structures. Ovario-hysterectomy was conducted under standard surgical procedure. On gross examination, right ovary had multiple cystic appearance and one large fluid filled cyst. Histopathological studies revealed the cystic wall lined with granulosa cells and degenerating cumulus oophorus cells but no oocyte. It contained about 100 μ L of clear, serous fluid. Uterine epithelium was lined with increased number and size of endometrial glands. Ovario-hysterectomy was conducted under standard surgical procedure and post operatively parenteral antibiotic of ceftriaxone and tazobactam combination @ 25 mg/kg b.wt. I/M and analgesic pentazocine @ 1 mg/kg b.wt. I/M were administered for 5 days. The bitch recovered uneventfully.

Keywords: Spitz, cystic ovarian follicular disease, ovario-hysterectomy

Introduction

Ovarian affections are uncommon in bitches (Johnston *et al.*, 2001) but they may affect health, fertility or even the life of the animal. Most common ovarian affections appear as cystic ovaries and ovarian tumors (Dow, 1960; Johnston *et al.*, 2001; McEntee, 1990). Cysts represent approximately 80% of ovarian affections (Dow, 1960).

Ovarian cysts are broadly defined as fluid-filled structures of any size within the ovary, present outside the physiological follicular phase of the estrous cycle (Schlafer and Miller, 2007). Ovarian follicular cysts are fluid-filled structures in the ovary with a distinct wall that may be secreting estrogen with subsequent estrogen-mediated effects on the female canine reproductive tract and extra reproductive system. Follicular cysts are hormonally active structures that develop in the female dog ovary. They often represent large antral follicles that failed to ovulate, but did not respond to atresia stimulus. Therefore, under gross examination, follicular cysts resemble Graafian follicles, larger than a normal follicle. In the bitch, anovulatory

cysts may develop as solitary or multiple structures, and they may also be unilateral or bilateral on ovary. As main difference to other carnivore species, the follicular cysts do not luteinize past the existing mural granulosa luteinization existing at the moment of its formation. Therefore, changes from an estrogen to progestagen dominance does not occur in dogs, compared to cats and cows (Ortega-Pacheco *et al.*, 2012). Due to presence of the physiological follicular phase of the oestrous cycle, the bitch shows attractiveness toward the dogs. Follicular cysts originate due to the inability of large antral follicle to respond to the ovulatory stimulus (Ortega-Pacheco *et al.*, 2012; MacLachlan *et al.*, 1987). According to sources of mechanism, it may originate from a central failure to produce an adequate amount of gonadotropins, in particular of LH that is essential for follicular growth and ovulation (Knauf *et al.*, 2014). Normal mature ovarian follicles in dog average from 5 to 8 mm in diameter. Ovarian follicular structures greater than 8 mm in diameter present during proestrus or estrus prior to ovulation or follicles of any size present during late estrus (post-

ovulation), diestrus or anestrus are defined as follicular cysts. McEntee Follicular cysts diagnosis is made based on the history of persistent estrus or hyperestrogenism. If estrus symptoms last for more than 28 days, a flaccid oedema of the vulva may be found along with whitish or mucopurulent discharge. Although the bitch displayed estrus behavior, but in general, bitch does not allow mounting (Just like proestrus foreplay). Diagnosis of ovarian cysts i.e. ultrasonography (Diez-Bru *et al.*, 1998), endocrine determinations (Knauf *et al.*, 2014), radiography, visual inspection or histopathology. Follicular cysts are usually visible on ultrasound scans as anechoic structures with thin walls and acoustic enhancement (Diez-Bru *et al.*, 1998), while the ovary retains its normal original ovoid shape. In general, ovarian follicles at ovulation measure 9 to 12 mm in diameter (Concannon, 2009). The size of the follicular cyst may vary from a few mm up to 300 mm (Ervin and Homanns, 1986). Vulva is frequently swollen and marked abundant dark sero-haemorrhagic or mucous discharge may be present (Yotov *et al.*, 2005). The follicular cysts may be single or multiple but not communicating and are thin walled structures containing clear serous fluid (Dow, 1960). They are often reported in large breeds of dogs. The present study reported the diagnosis of follicular cysts in a Spitz bitch and its management.

Case Report and treatment

A 6-year-old intact Spitz bitch was presented to the Teaching Veterinary Clinical Complex, OUAT-College of Veterinary Science and Animal Husbandry, Bhubaneswar with the complain of long period of vaginal bleeding for more than one month that has become progressively heavier. There was progressive non-pruritic, bilaterally symmetrical alopecia at the perineal region. On clinical examination, the abdominal cavity was distended, no wounds or masses were observed in vulva and caudal vaginal regions. The bitch was examined physically which showed rosy pink, edematous vaginal mucosa, characteristic of proestrus. Digital vaginal examination had no specific findings. A vaginoscopy was performed under sedation and no abnormalities were found such as foreign bodies. Hematological examination showed Hb @ 8.8 g/dL, TLC at 34000/ μ L with neutrophils 78%. Vaginal cytology indicated presence of cornified vaginal

epithelium cells indicative of elevated serum estrogen concentration. Besides, there were presence of cellular debris, red blood cells (RBCs), polymorphonuclear leucocytes and bacteria. Ultrasound examination showed focal hypo-echoic to anechoic cystic structure with far enhancement caudal to kidney within the ovary. The structures measured a size of about 10 cm in diameter. There is visualization of the thickened uterine endometrium indicative of cystic endometrial hyperplasia.

Based on the clinical and haematological findings along with vaginal cytology and ultrasound report it was diagnosed to be a chronic cystic ovarian degeneration. Hormonal therapy with GnRH or hCG has been reported with limited success (Fayrer-Hosken, 1992). Therefore, it was decided to conduct ovario-hysterectomy under standard surgical procedure.

The animal was premedicated with atropine sulphate @ 0.02-0.04 mg/kg b. wt. S/C (Tropine – Neon Laboratories Ltd., Mumbai) and anaesthetized using a combination of xylazine hydrochloride @ 1-2 mg/ kg b. wt. I/M (Xylaxin - Indian Immunologicals Ltd., Hyderabad) and ketamine hydrochloride @ 5-10 mg/kg b. wt. I/M (Ketmin - Themis Medicare Ltd., Haridwar). A venous port was fixed and maintained with 5 % DNS (dextrose normal saline) and incremental doses of ketamine hydrochloride was administered to maintain the anaesthesia. Animal was placed dorsal recumbency. The surgical site (mid- ventral) from umbilicus to pubis with 5-10 cm width was prepared aseptically. Skin incision starts from 1-2 fingers width caudal to the umbilicus upto around 5-7cm (2-3 inches). Dissect through the subcutaneous tissue to expose the linea alba which is a fibrous, white line/band running along the midline from which abdominal muscles attached from either side. Incise the linea alba by elevating abdominal muscle with rat-toothed forceps so that the linea alba is held between the teeth of the forceps (to prevent injury from blade to underlying abdominal contents), hold scalpel with sharp-side facing upwards, make a small stab incision through linea alba into the abdominal cavity. Extend the linea alba incision using mayo scissors. After exposing the abdomen by laparotomy, locate a uterine horn and gently take out to surgical site, identify the ovary, stretching of suspensory ligament (taut, fibrous

band at the proximal edge of ovarian pedicle) for greater exposure to ovarian pedicle. Found enlarged ovarian bursa on right side ovary, Ligate the ovarian pedicle with catgut No. 1-0 (Ethicon, Johnson and Johnson Ltd., Baddi, H.P. 173-206, India), transect the ovarian pedicle, inspect and release the ovarian pedicle, repeat on other side ovary and then locate and ligate the uterine body with same catgut no. 2 suture material. The uterine and ovarian blood vessels were properly secured (clamped and ligated with catgut) and the ovaries, uterine horns and uterus were completely removed. Final inspection of abdominal cavity to check for bleeding. The abdominal wall was closed with according to a standard procedure with 2-0 PGA (polyglycolic acid) simple continuous suture pattern, antibiotic powder was sprinkled over the suture area, then followed by subcutaneous closure with same PGA suture material and then skin closure –interrupted cross- mattress suture pattern using silk thread no. 2 (Ethicon, Johnson and Johnson Ltd., Baddi, H.P. 173-206, India). On gross examination, opening of ovarian bursa, right ovary had multi-cystic appearance and one large fluid filled cyst. It contains about 100 μ L of clear, serous fluid. Histopathological studies revealed the cystic wall lined with granulosa cells and degenerating cumulus oophorus cells but no oocyte. Uterine epithelium was lined with increased number and size of endometrial glands (Dow, 1960).

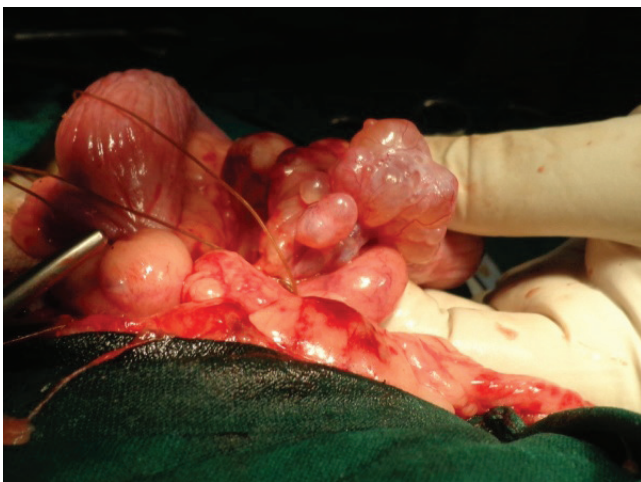


Figure 1. Multiple follicular cysts in right ovary

Post operatively parenteral antibiotic of ceftriaxone and tazobactam combination @ 25 mg/ kg b.wt. I/M

(Intacef Tazo - Intas Pharmaceuticals Ltd., Ahmedabad) and analgesic pentazocine @ 1 mg/ kg b.wt. I/M (Fortwin - Ranbaxy Laboratories Ltd., Gurgaon) were administered for 5 days. The cutaneous wound was dressed with 5% povidone iodine solution (Betadine – Win Medicare Ltd., New Delhi) daily and local application of antibiotic ointment until healing. The skin sutures were removed on day 10. The bitch recovered uneventfully. Vaginal edema was relieved on day 7. New hairs started to grow at the site of alopecia on day from 15-20.

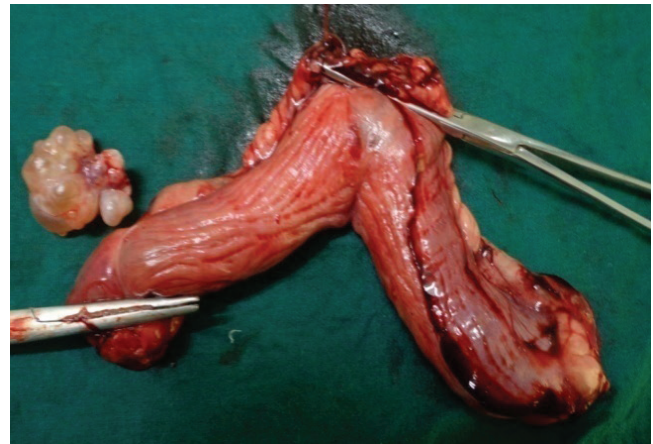


Figure 2. Excised distended uterine horn and polycystic ovary

Discussion

Cystic ovarian structures in a bitch include follicular cysts, luteal cysts, germinal cysts, cystic corpora lutea, cystic germinal cell tumors and para ovarian cysts (Akihara *et al.*, 2007). Para ovarian cysts are similar in morphology to ovarian cysts but lie next to the ovary. The follicular cysts may be single (37.5% - 65%) or multiple (35% - 62.5%) with no communication between individual cysts. Either or both ovaries may have follicular cysts. Incidence varies from 3% to 62%. They are more prevalent in nulliparous bitches and in bitches above 5 years of age (McEntee, 1990). Reported diameter vary from 0.5 to 19 cm with single cysts often reported at 1 to 1.5 cm and multiple cysts at 10 cm or less in diameter (Jubb and Kennedy, 1970). They contain up to 250 to 750 μ L of clear and serous fluid. The cyst is lined with granulosa cells and remnants of degenerating cumulus oophorus cells but no oocyte. Serum concentration of estrogen varies from 3 to 143

pg/mL (normal-2-10 pg/mL) with subsequent estrogen mediated effects on the dog's reproductive tract and extra reproductive systems. Concurrent disease – cystic endometrial hyperplasia -pyometra complex is reported in 75% of dogs. The persistent estrus associated with cystic follicles is a primary cause of cystic endometrial hyperplasia and severe cases of CEH are associated with infertility. Rapid intervention (surgical or hormonal) will limit the severity of CEH (Jubb and Kennedy, 1970). Common complaint is estrus cycle irregularity, prolonged estrus period with symptoms such as vulvar swelling, presence of excessive serosanguinous vulvar discharge, irregular inter-estrus interval, variability in physiological changes and breeding behaviour during estrus. There is abdominal distension. Skin changes characteristic of hyper-estrogenism include bilateral symmetrical alopecia of the trunk, hyperkeratosis and lichenification (Jubb and Kennedy, 1970). Differential diagnosis is done from functional ovarian neoplasia by age of occurrence, signalment and histopathology. Diagnosis is carried out by vaginal cytology and ultrasonography. Treatment of cystic ovaries in a bitch was unsuccessful with human chorionic gonadotropin (hCG @ 500 IU I/M BID q48h) or Gonadotrophin-releasing hormone (GnRH@ 50µg I/M). The treatment of choice is ovario-hysterectomy.

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