

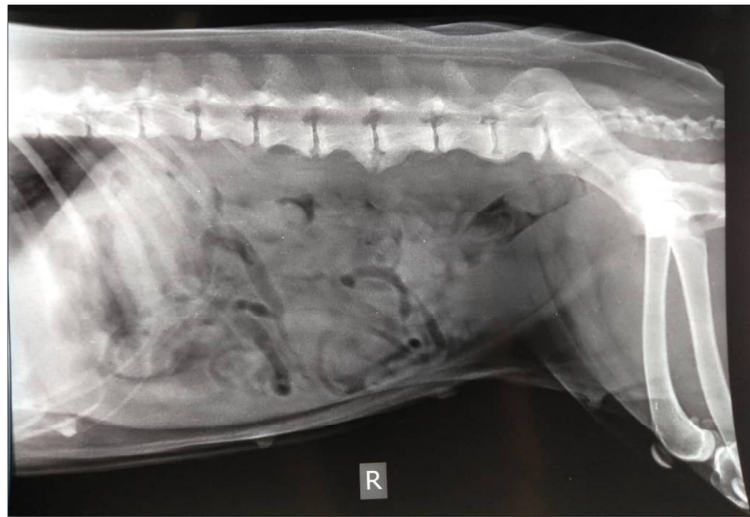


**CASE DESCRIPTION**

A ten years old female Golden Retriever dog, 30 kg not spaying female visited Airlangga University Veterinary Teaching Hospital with a condition of mucus discharge from vagina for two days, decreased appetite and lethargy.

Physical examination revealed no sign of anemia, body temperature was normal (38.5°C), pulse rate 120 bpm and

painting. X-Ray examination showed spondylosis deformans due to the age and the position of the small intestine slightly pushed forward (**Figure 1**). Blood and serum were collected for hematology and biochemistry examination to show any abnormality value of internal organs work. Base on blood test, there is not any infection and inflammation have been occurring, therefore the early diagnosis of pyometra have been rejected and suspected as malignant tumors.



**Figure 1.** X-ray photo.

**TREATMENT METHODS**

Fluid therapy used NaCl 0.9 (400 ml) intravenous route on the first day. The next day, surgery of ovariohysterectomy was performed (**Figure 2**). Injection treatment after surgery was given; adona (Carbazochrome Sodium Sulfonate 5 mg/ml), 4.0 ml and dexamethasone, 3.0 ml.

On second day, oral medication was given BID for 5 days based on the dosage consist of doxycycline (antibiotic) 10mg/kg body weight, dexamethasone (anti-inflammation) 0.2mg/Kg BW and neurobion vitamins (neurotropic multivitamin) 10mg.Kg BW.



**Figure 2.** Ovarium tumor.

## RESULTS

The treatment showed a good progression and no more mucus discharge from the vagina. After five days of surgery the dogs seem normally active and there were no pathological changes.

## DISCUSSION

Ovarian epithelial tumors arise from cells of the surface epithelium that also extend into the ovarian cortex [1]. Some case reports, epithelial tumors represent 40%-50% of all ovarian neoplasms and are often bilateral [2,18-20]. They are represented by adenomas and adenocarcinomas that can further be described as papillary, serous, cystic or pseudo mucinous [3]. Papillary adenomas and adenocarcinomas, are usually observed near the ovarian surface as cauliflower-like lesions [20]. Also, rete adenomas, fibromas and undifferentiated carcinomas have been described [3].

Granulosa cell tumors (GCTs) has been described in the bitches as well as the other types of sex-cord stromal tumors. GCTs may produce and increase secretion of hormones such as estradiol, progesterone and a-inhibin [21]. As a result of its hormonal secretion, GCT often induces persistent estrus, vulvar swelling with discharge, and alopecia [1,22].

In humans, ovarian carcinoma is the second most common gynecological cancer and, in most cases, a poor prognosis for long-term survival [23]. Treatment procedure in human ovarian neoplasm is cytoreduction of gross to <1cm thickness combined with chemotherapy used platinum compound and paclitaxel [23,24]. In small animals, there is no formal standard to cure canine ovarian carcinoma. It has a high risk of metastasis in the abdominal region. In many cases, the dog's survival rate is very low and the owner ask for euthanize the dogs in the critical condition [2,17].

Some cases with hormone producing tumors may require additional supportive treatment that includes the use of granulocyte colony stimulating factor and erythropoietin to stimulate production of neutrophils and erythrocytes, respectively [3]. In a dog with ovarian adenocarcinoma, intracavitary cisplatin chemotherapy after OH led to an 8-month resolution of malignant effusion. Higher cisplatin concentration at the tumor surface by intracavitary than intravenous administration has been reported in a rat peritoneal tumor model and advantage is seen only in the outer 1.5 mm of the tumor tissue [25].

There are no consistent abnormalities in blood examinations in dogs with ovarian tumors [2,26]. Clinical signs are generally nonspecific, but indications of hormonal disturbances including abnormal estrus cycle, or polyuria/polydipsia, vaginal discharge may help indicate a possible ovarian tumor [2,26]. Ultrasonographic examination has also been used to detect ovarian masses in dogs [2,27,28]. Ovarian adenocarcinomas appear as irregular-shaped masses with heterogeneous echogenicity or with

multiple anechoic cysts [2,27,28]. Diez-Bru [2] reported that ovarian masses less than 6 cm in size, especially when involved bilaterally, could be identified as of ovarian origin when the kidney was used as an anatomic landmark.

As a treatment for ovarian carcinoma, chito oligomers can be given chito oligomers. Chito Oligomers compounds are reported to have anti-cancer activity, this report was stated by Yeon [29] that hexa N-acetyl chitohexaose and keto-hexose have growth inhibitory effects from metastatic tumor cells. Semenuk [30] reported the activity of chito oligomers as an anti-tumor through the ability of chito oligomers compound to act as a ligand for natural killer cell receptors resulting in cellular activation of the immune system so that the chito oligomer can function as an anti-tumor. Pae [31] reported inhibition of promyelocytic leukemia (HL-60) cells by water-soluble chitosan oligomers (WSCO).

## CONCLUSION

It could be concluded that in the above case, the dog was diagnosed ovarian carcinoma in situ. Ovariohysterectomy surgery with chemotherapeutic medication treatment with doxycycline combination is the best solution for this case to avoid the metastasis.

## REFERENCES

1. Johnston SD, Kustritz MV, Olson PNS (2001) Disorders of the canine ovary. In S. D. Johnston, M. V. Kustritz & P. N. S. Olson (Eds.), *Canine and feline theriogenology*. Philadelphia: WB Saunders. pp: 193-205.
2. Diez-Bru N, Garcia-Ral I, Martinez EM, Rollan E, Mayenco A, et al. (1998) Ultrasonographic appearance of ovarian tumors in 10 dogs. *Vet Radiol Ultrasound* 39: 226-233.
3. McEntee MC (2002) *Reproductive Oncology*. Clin Tech Small Anim Pract 17: 133-149.
4. Yotov S, Simeonov R, Dimitrov F, Vassilev N, Dimitrov M, et al. (2005) Papillary ovarian cystadenocarcinoma in a dog. *J South Afr Vet Assoc* 76(1): 43-45.
5. Hori Y, Uechi M, Kanakubo K, Sano T, Oyamada T (2006) Canine ovarian serous papillary adenocarcinoma with neoplastic hypercalcemia. *J Vet Med Sci* 68(9): 979-982.
6. MacLachlan NJ (1987) Ovarian disorders in domestic animals. *Environ Health Perspect* 73: 27-33.
7. Ball RL, Birchard SJ, May LR, Threlfall WR, Young GS (2010) Ovarian remnant syndrome in dogs and cats: 21 cases (2000-2007). *J Am Vet Med Assoc* 236: 548-553.

8. Theilen GH, Madewell BR (1979) Tumors of the urogenital tract. In *Veterinary cancer medicine*. Lea & Febiger, Philadelphia. pp: 367-373.
9. Yamini B, Van Den Brink PL, Refsal KR (1997) Ovarian steroid cell tumor resembling luteoma associated with hyperadrenocorticism (Cushing's disease) in a dog. *Vet Pathol* 34: 57-60.
10. Sforza M, Brachalente C, Lepri E, Mechelli L (2003) Canine ovarian tumors: A retrospective study of 49 cases. *Vet Res Commun* 27: 359-361.
11. McCandlish IA, Munro CD, Breeze RG, Nash AS (1979) Hormone producing ovarian tumors in the dog. *Vet Record* 105: 9-11.
12. Greenlee PG, Patnaik AK (1985) Canine ovarian tumors of germ cell origin. *Vet Pathol* 22: 117-122.
13. Jergens AE, Shaw DP (1987) Tumors of the canine ovary. *Compendium on Continuing Education for the Practicing Veterinarian*. 9: 489-495.
14. Norris HJ, Garner FM, Taylor HB (1970) Comparative pathology of ovarian neoplasms. IV Gonadal stromal tumors of canine species. *J Comp Pathol* 80: 399-405.
15. Kennedy PC, Cullen M, Ewerts JF, Goldschmidt MH, Larsen S, et al. (1998) Histological classification of tumors of the genital system of domestic animals. In: *World Health Organization, international histological classification of tumors of domestic animals*. American. Vol: IV.
16. Foster RA (2006) Female reproductive system. In: McGavin MD and Zachary JF (eds) *Pathologic basis of veterinary disease*. 4<sup>th</sup> edn. Mosby, China. pp: 1280-1282.
17. Petterino C, Modesto P, Ratto A (2010) A bilateral ovarian psammomata's papillary cystic adenocarcinoma in a German shepherd bitch. *Comp Clin Pathol* 19: 389-395.
18. O'Keefe DA (1995) *Tumors of the genital system and mammary glands*. Philadelphia: Saunders Company. Vol: 2.
19. Patnaik AK, Greenlee PG (1987) Canine ovarian neoplasms: A clinicopathologic study of 71 cases, including histology of 12 granulosa cell tumors. *Vet Pathol* 24: 509-514.
20. Nilesen SW, Misdorp W, McEntee K (1976) Tumors of the ovary. *Bull World Health Organ* 53: 203-215.
21. Pluhar GE, Memon MA, Wheaton LG (1995) Granulosa cell tumor in an ovariohysterectomized dog. *J Am Vet Med Assoc* 207: 1063-1065.
22. Buijtelts JJCWM, Gier J, Kooistra HS, Veldhuis KEJB, Okkens AC (2010). Alterations of the pituitary-ovarian axis in dogs with a functional granulosa cell tumor. *Theriogenol* 73: 11-19.
23. Zeimet AG, Reimer D, Radl AC (2009) Pros and cons of intraperitoneal chemotherapy in the treatment of epithelial ovarian cancer. *Anticancer Res* 29: 2803-2808.
24. Bristow RE, Tomacruz RS, Armstrong DK, Trimble EL, Montz FJ (2002) Survival effect of maximal cytoreduction surgery for advanced ovarian carcinoma during the platinum era: A meta-analysis. *J Clin Oncol* 20: 1248-1259.
25. Los G, Mutsaers PH, van der Vijgh WJ, Baldew GS, de Graaf PW, et al. (1989) Direct diffusion of cis-diamminedichloroplatinum (II) in intraperitoneal rat tumors after intraperitoneal chemotherapy: A comparison with systemic chemotherapy. *Cancer Res* 49: 3380-3384.
26. Klein MK (2007) Tumors of the female reproductive system. In: *Small animal clinical oncology*, 4th ed. (Withrow, J.S. and Vail, D.M. eds.), W.B. Saunders, Philadelphia. pp: 610-618.
27. Goodwin JK, Hager D, Phillips L, Lyman R (1990) Bilateral ovarian adenocarcinoma in a dog: ultrasonographic-aided diagnosis. *Vet Radiol* 31: 265-267.
28. Olsen J, Komtebedde J, Lackner A, Madewell BR (1994) Cytoreductive treatment of ovarian carcinoma in a dog. *J Vet Intern Med* 8: 133-135.
29. Yeon JC, Kim EJ, Piao Z, Yun YC, Shin YC (2004) Purification and characterization of chitosanase from *Bacillus* sp. strain KCTC 0377BP and Its application for the production of chitosan oligosaccharides. *Appl Environ Microbiol* 70: 4522-4531.
30. Semenuk T, Krist P, Pavlíček J, Bezouska K, Kuzma M, et al. (2001) Synthesis of chito oligomer-based glycoconjugates and their binding to the rat Natural Killer cell activation receptor NKR-P1. *Glycoconj J* 18: 817-826.
31. Pae HO, Seo WG, Kim NY, Oh GS, Kim GE, et al. (2001) Induction of granulocytic differentiation in acute promyelocytic leukemia cells (HL-60) by water-soluble chitosan oligomer. *Leukemia Res* 25: 339-346.