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Case study of hydrometra and uterine adenocarcinoma in a pet rabbit

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Abstract

Hydrometra is the accumulation of fluid within the uterine cavity. Hydrometra may be manifested alone or in combination with other manifestations of reproductive pathology. The current paper presents a case study of a female pet rabbit. The rabbit was brought to the clinic with complaints in the gastrointestinal system. Initial symptoms had been resolved and the rabbit was brought to the clinic for a second time. Physical examination revealed an enlarged abdomen with fluctuations and a soft-elastic texture; the body temperature was normal: 39.3°C; the breathing and heartbeat were normal. Examination of the genitalia didn't present any discharges or signs of any infection. Ultrasound was performed, with a 3.5-7 MHz micro-convex transducer, B-mode in real time. Transabdominal ultrasonography revealed an enlarged uterus due to an anechoic structure. Clinical assessment led to the diagnosis hydrometra and was based on the anamnesis, physical status, ultrasound and blood tests including chemistry and haematology. The owners were advised that surgical extraction of the uterus had to be performed.

Keywords: Hydrometra, rabbits, uterine adenocarcinoma, endometrial hyperplasia.

Introduction

Recently rabbits are more often raised as pets and as a consequence are often patients in veterinary clinics. Different pathologies might cause diseases of the female genital system in the rabbit. The prevailing diagnoses are adenocarcinoma and endometrial hyperplasia (Saito and al. 2002), but hydrometra is also observed. In most of the cases the clinical signs are blood in the urine (haematuria) and serous or purulent vaginal discharge (Paré and Paul-Murphy 2004). Uterine adenocarcinoma is said to be the most common neoplasia of the genital system in female rabbits (Stein and Walshaw 1996). Cases of neoplasia proportionally increase with the age of the animal and at the age of 4 more than 60% of the animals are diagnosed with such conditions (Frances Harcourt-Brown, 2002).

Description of the clinical case

The patient is a female pet bunny (no specific breed), 4 years old. The Owners had noticed that the patient's abdomen had visibly enlarged in the past several days. They reported that the animal had increased its water intake. History of the disease: 1.5 month ago the rabbit demonstrated gastrointestinal indisposition manifested with lack of appetite, flatulence (transit swelling in the right abdomen), changes in the excrements: fewer quantity, smaller, and unshipped. During the physical examination at the first visit to the clinic no abnormalities except for a suspected soft, voluminous formation within the abdomen were found. The owners refused an ultrasound examination. At that time we assessed the case as related to a gastrointestinal disorder due to change of the food and most probably accompanied with ingestion of own hair. The condition of the animal improved following treatment with a diet, I.M. Methoclopramide and P.O. Simethicone. On the 3rd - 4th day of the start of treatment the rabbit improved and on the 5th - 6th day the rabbit ate his regular food (mixture, hay) and excrements returned to their normal form and quantity.
During an examination, one month later, the rabbit's abdomen is significantly enlarged and symmetric (Figure 1).

Figure 1. Dorsal view of the symmetrically enlarged patient's abdomen.

Clinical examination: normal body temperature (39.3°C), normal breathing and heartbeat. Manual examination of the abdomen revealed fluctuation and a soft-elastic texture. It is a typical finding for a

collection of fluid within the abdominal cavity or rather fluid within an abdominal organ. No discharges were visible during the external examination of the genitalia. Palpation of the abdomen sowed no muscular defence, pain or discomfort. The visible mucosa is pale, normally hydrated, with normal CRT. Ultrasound was performed, uisng 3.5-7 MHz micro-convex transducer, B-mode in real time, machine Mindray DP-10 Vet. The transabdominal ultrasonography revealed a significantly enlarged uterus due to an anechoic structure (Fig. 2).

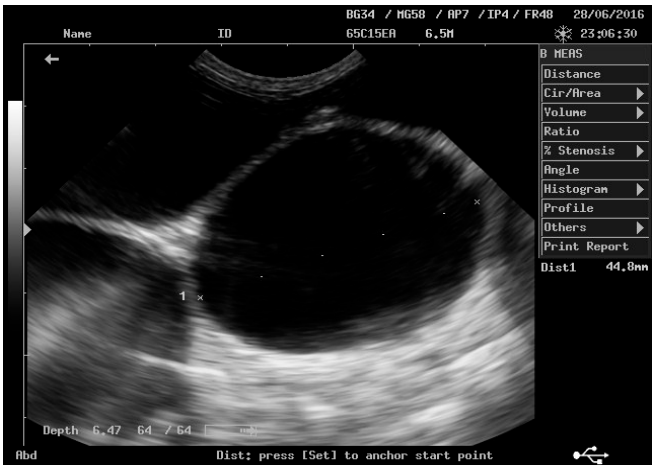

Fig.2. Ultrasound of the rabbits' uterus

Blood samples were taken for haematology (Mindray BC 2800 Vet) and chemistry (Mindray BA-88A). The results are presented in Tables 1 and 2.

Table. 1 Haematology tests of the patient

Parameter	Result	Ref.Range	Parameter	Result	Ref.Range
WBC	3.1 x 10^9/L*	5.2 - 13.5	**HCT**	35.9 %	31.0 - 46.0
Lymph#	1.3 x 10^9/L*	3.2 - 9.0	**MCV**	61.7 fL	56.8 - 66.5
Mon#	0.1 x 10^9/L	0.1 - 0.6	**MCH***	19.0 pg	20.1 - 25.1
Gran#	1.7 x 10^9/L*	2.0 - 7.5	**MCHC***	309 g/L	320 - 370
Lymph%	41.2 %	35.2 - 75.6	**RDW***	11.7 %	13.0 - 18.5
Mon%	3.8 %	2.5 - 6.0	**PLT**	403 x 10^9/L	100 - 712
Gran%	55.0 %	20.2 - 59.3	**MPV**	4.8 fL	3.8 - 6.8
RBC	5.82 x 10 ^{12}/L	5.0 - 7.6	**PDW**	16,4	
HGB	111 g/L	105 - 107	**PCT**	0.193 %	

** values lower than the lowest normal value for the species.*

Table. 2 Chemistry tests of the patient's blood serum

Parameter	Result	Unit	Parameter	Result	Unit
ALT	4	U/L	**ALB**	31,3	g/L
AST	7	U/L	**UREA**	1,2	mmol/L
ALP	190	U/L	**CREAT**	73,1	µmol/L
γ-GT	3	U/L	**Ca**	1,98	mmol/L
α-AMY	215	U/L	**P**	1,1	mmol/L
GLU	13.93	mmol/L	**GLB**	29,8	g/L
TBIL	3,2	µmol/L	**IBIL**	2	µmol/L
DBIL	1,2	µmol/L	**AST/ALT**	1,75	
TP	61,1	g/L	**A/G**	1,1	

Assessment is based on the anamnesis, clinical examination and ultrasound and blood tests. The final diagnosis is hydrometra. The owners were advised that surgical removal of the uterus had to be performed. 24 hours prior to the surgery the patient was treated with Enrofloxacin S.C. (10 mg/kg Hipralona Enro-I 5% solution, Laboratorios Hipra, S.A., Spain).

Medial laparotomy was performed. Both uterine horns were inflated with fluid and fill out the majority of the abdominal cavity (Figure 3). Both uterine horns were removed from the abdominal cavity. Further steps were ligatures of the horns and their removal. When we removed the uterus from the abdomen we noticed a neoplasia situated in the area of bifurcation of the horns (Figure 4). Part of the neoplastic material was removed and sent for histological analysis. The histology examination confirmed moderate to well differentiated adenocarcinoma.

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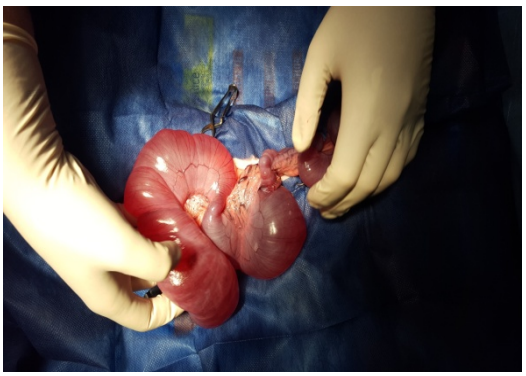

Figure 3. Uterine horns with fluid

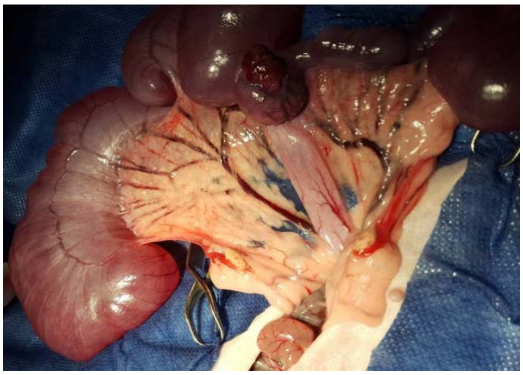

Figure 4. Neoplastic mass in the area of uterine horn bifurcation.

While the uterus and ovaries were being extracted we noticed that the bladder wall contacting the uterus was haemorrhagic, puffy and swollen. We took sterile samples from the uterine fluid for further bacteriological examination. Macroscopic examination of the sterile samples showed that the fluid was clear and transparent (Figure 5)

Figure 5. Sterile sample of the uterine fluid

Microbiological examination of the samples proved the presence of a small quantity of *Serratia marcescens.*

Discussion

The reproductive cycle of female rabbits doesn't depend on the seasons. The release of eggs is triggered by sexual intercourse, not by a cycle of hormones. It is possible for some of the manipulations performed on rabbits to lead to release of eggs and as result rabbits present with a false pregnancy and all associated symptoms. It is still unclear how false pregnancy affects the uterine mucosa and if it may lead to uterine diseases.

A common disease in rabbits, especially following their 4th year, is hyperplasia of the endometrial mucosa alone or in combination with adenocarcinoma (Saito et al., 2002, B. Walter et al., 2010).

Hydrometra is rarer in rabbits, but is also a serious problem for this animal species. Saito et al., 2002 prove this statement in their research on 47 female rabbits with different uterine disorders. The authors confirmed that hydrometra is the second most frequent disorder and initial disorder in 6 rabbits and a

secondary one in in 4 rabbits. The etiology of hydrometra is still unclear in regard to its relation to the reproductive cycle and ovulation in rabbits. Release of eggs in rabbits is triggered with stimulation, some authors report self-induced ovulation in rabbits (Adams 1987). As a consequence, the levels of progesterone increase. This hormone leads to increased secretion of the endometrial glands and a functional cervical closure. The result is continuous accumulation of secrets in the uterus and visible clinical signs. The current case is most probably caused by self-induced ovulation - the rabbit has never been in contact with a male animal. The examining doctor determined the diagnosis of hydrometra on the basis of the lack of discharges form the vagina in combination with an enlarged abdomen and a normal general condition. The diagnosis was further confirmed by an ultrasound examination of the uterus and it revealed fluid without in cellular detritus within the uterus.

The rabbit was in good general condition and had no clinical signs of other disorders. The presence of moderate to well differentiated adenocarcinoma was diagnosed during the surgery for removal of the uterus and ovaries. Walter et al. (2010) report adenocarcinoma in rabbits without endometrial hyperplasia but the same authors also report that both conditions can occur simultaneously. Despite the fact that it is still unclear if the hyperplasia in the uterine mucosa influences in any aspects the adenocarcinoma, such a relation cannot be excluded. Both disorders have common factors in their pathogenesis and are related with hormonal stimulation - reported by Asakawa et al. (2008). They studied the presence of estrogene receptors **α** (ERα) and progesterone receptors within normal uterine tissue. Both receptors were confirmed in 59,3% of the normal tissues; 68,4% in uterine tissue with endometrial hyperplasia; 80,8% of tested tissues with papilar adenocarcinoma were negative for both receptors and 93,8 % of tested adenocarcinomas were positive for one or for both receptors.

Conclusion

Based on the current case and literature review, it can be concluded that the approipriate treatment for rabbits with endometrial hyperplasia (hydrometra) and uterine adenocarcinoma without metastases is the extraction of the ovaries and uterus. This is also confirmed by the statistics for survival of rabbits following extraction of adenocarcinoma. Saito et al. (2002) reported 21,3% fatalities in rabbits following surgical extraction of ovaries and uterus as treatment of uterine adenocarcinoma. Regular ultrasound examinations of the genital system are recommended for all female fertile rabbits.

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