



A Case Report of Diagnosis and Resolution of Pyometra in a Jaguar (*Panther onca*) with Heart Disease

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Abstract

Pyometra, is a uterine disorder mediated by the hormone progesterone, in jaguars, there are few case reports and none in an animal with acquired heart disease. The pyometra is classified as open and closed cervix, according to the presence or absence of vulvar discharge (pyometra can lead to renal, digestive and cardiac complications, with uremic syndrome being the major cause of death, even more in a cardiopath. During a visit to evaluate the state of health of jaguars (*Panthera onca*) in a wildlife conservation center in south eastern of Mexico, cardiac alterations and the presence of open cervix pyometra were diagnosed, which later progressed to closed cervix pyometra, in this work, we detail the methodology used for its diagnosis and its successful treatment of pyometra. The information provided in this case is original because it is an uncommon clinical case, diagnosed and treated by the authors; novel because it is a species at risk of extinction and a condition not reported in jaguars as well as topical since we used efficient and safe valuations and diagnostic methods, the manuscript represents new information that has not been previously submitted or published elsewhere.

Keywords: Endometrial Disease; Heart Disease; Jaguar; *Panthera onca*; Pyometra

Introduction

The presentation of pyometra in domestic felines is a relatively frequent condition, in jaguars (*Panthera onca*), there are few case reports [2,3,5,6] and none in an animal with acquired heart disease. The complex cystic endometrial hyperplasia - pyometra, is a uterine disorder mediated by the hormone progesterone. During the luteal phase of the estrous cycle, progesterone suppresses the leukocyte response in the uterus, decreases myometrial contractility and stimulates the development and secretory activity of the endometrial glands, predisposing to a medium for secondary bacterial infection by the vaginal biota. The pyometra is classified as open and closed cervix, according to the presence or absence of

vulvar discharge (pyometra can lead to renal, digestive and cardiac complications, with uraemic syndrome being the major cause of death [1].

The diagnosis is based on the clinical history, symptoms and complementary examinations. The radiological image reveals an enlarged uterus and displacement of organs, the ultrasound image shows the uterus with anechoic liquid content. Hematological and biochemical tests can demonstrate leucocytosis with neutrophilia, anaemia, which may be masked by dehydration, increase in the rate of urea, creatinine and total proteins (globulin) and decrease in the level of albumin. In urinalysis, there may be proteinuria and

the presence of cylinders. The most efficient treatment is surgery, through ovariectomy, with the greatest postoperative complications being toxemia and septicemia. The clinical treatment aims to drain the uterine content, eliminate bacterial infection and restore reproductive capacity. The hormone oxytocin, derived from ergometrine and estrogen, has been used with limited success. The best result has been obtained with prostaglandin F₂ by promoting luteolysis, uterine evacuation and myometrial contractions, but it can cause side effects such as vomiting, tremors and diarrhoea. This treatment must be accompanied by broad-spectrum antibiotic therapy and does not always give good results, which may be followed by recurrences. Its use is indicated only in young, reproductive females, with exclusively open pyometra and that do not present an affected general state [2-6].

Case Report

As a result of the assessment of the health status of 5 jaguars (3 females and 2 males) in the aforementioned conservation center on July 14 and 15 of 2018, one of the females named "Fiona" of 6 years old, was detected by electrocardiography who presented heart rhythm of sinus origin with atrioventricular block of 2nd degree, deep S waves and with supralevel QT, as well as in echocardiographic evaluation in right parasternal window, longitudinal section of left ventricular outflow tract in B mode with color Doppler, reflux due to aortic valve regurgitation by calcification and reflux due to tricuspid valve insufficiency, with preserved hemodynamic values, as well as in abdominal ultrasound, increase in size and presence of fluid in the uterine tubes. Haematological analyses, of blood chemistry and general urine, were found within values. The corresponding reports and recommendations were made to those in charge of the center for their medical attention and while their authorization was awaited (four months), the animal showed anorexia and decay, so a new assessment was made, detecting that the cervical neck was closed, so radiographs, tomography and again blood tests, blood chemistry and general urine were made, reaching the diagnosis of pyometra closed cervix, so emergency corrective surgery was performed.

Derived from our multidisciplinary and multicentric research project in which holistic animals at risk of extinction in Mexico are evaluated in an integral manner; in a wildlife conservation center in the southeast of the country, the chemical containment of a 6-year-old, fully asymptomatic female jaguar (*Panthera onca*) was carried out, using a combination intramuscular of tiletamine/zolacepam

1:1 (Zoletil® Virbac, México) 3 mg/kg and xylazine (Xilacin® 2% Virbac) 0.5 mg/kg. Once the unconsciousness of the animal was achieved, it was moved from its cage to the infirmary of the place and placed on a table in the right lateral recumbency position for general auscultation; cardiovascular auscultation and blood sampling for blood cytometry, blood chemistry and serology tests. The physical alterations found during the evaluation consisted of bulging abdomen, pendulous mammary glands and mucopurulent vaginal discharge.

The electrocardiographic record was evaluated in derivative II: cardiac rhythm of sinus origin with presence of atrioventricular block of 2^o, deep S waves with QT supralevel (Figure 1).

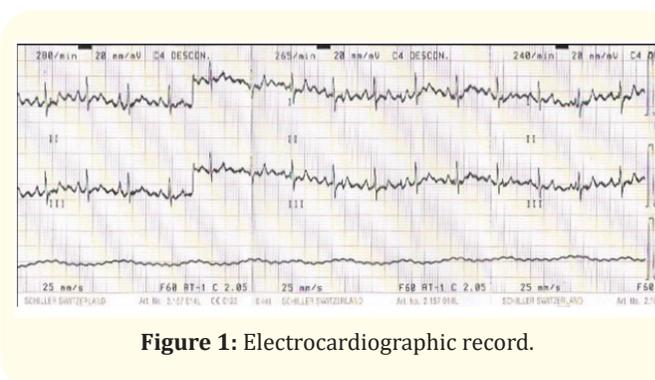


Figure 1: Electrocardiographic record.

The echocardiographic images were observed in the right parasternal window and longitudinal section of the LV exit tract in B-mode and with color Doppler; blood reflux due to aortic valve insufficiency, and reflux due to tricuspid valve insufficiency (Figure 2), with shortening values. and left ventricular ejection preserved.

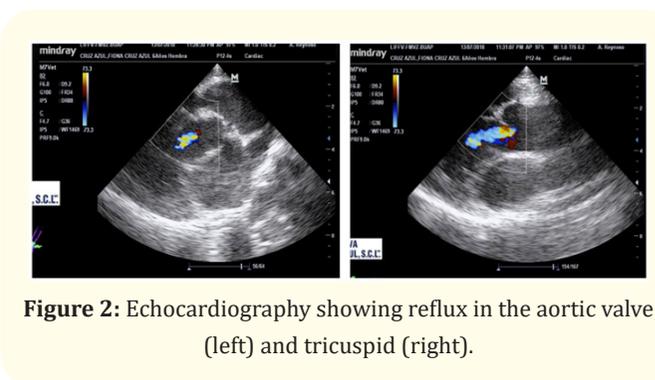


Figure 2: Echocardiography showing reflux in the aortic valve (left) and tricuspid (right).

The abdominal ultrasound showed uterine tubes with anechoic fluid content, as well as the abdominal radiography in the dorso-ventral position (Figure 3).



Figure 3: Abdominal x-ray of the patient showing (inside the circle) bilateral pyometra.

Blood chemistry and blood cytometry reported normal values for the specie and sex in the first evaluation in which the cervix was open.

Despite having made the appropriate medical recommendations for their care, these were not carried out. Four months later, the animal stopped eating, behaved in an erratic and depressed manner, so it proceeded to its assessment again, finding no vulvovaginal discharge, so it was diagnosed that the cervix had closed and began the toxemic phase. Hematological and biochemical studies were performed again and that reported neutrophilia with deviation to the left, eosinophilia, hypoglycemia and proteinuria.

In order to ensure the diagnosis, computerized axial tomography was performed, confirming the pyometra and as a finding nephrolithiasis (Figure 4).



Figure 4: Tomography of patient; note the uterine tubes with content and kidneys with uroliths.

The haematological values and pre-surgical biochemical analysis showed changes in relation to leucocytosis and neutrophilia; however, there were no relevant changes that indicated renal problems. So, it is concluded that the animal still had no septicemic state.

Evaluation was made by tomography which confirms the diagnosis of pyometra and uroliths are observed in both kidneys.

Results

The animal was successfully subjected to ovariectomy, under induction of zolazepam/tiletamine combination as mentioned above and with maintenance through general inhalation anaesthesia (Isoflorane Sofloran® vet, PISA, México). The postoperative period did not have any complications.

Discussion and Conclusion

Given the scarcity of publications regarding this case and specie, it is not possible to make its discussion and it would be unethical to compare it with domestic felines. Having the diagnosis and with the authorization of opportune treatment, the surgical procedure and the risks that it represents would have been avoided; however, the early intervention, the risk assessment for a cardiopathic animal, with complete complementary studies, allowed the success in the anaesthetic, surgical procedure and the safeguard of the life of the jaguar.

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Anestesiist. MVZ. Gerardo Daniel Maldonado Flores.

Instrumentist: PMVZ. Jessica Damara Jiménez Sierra.

Current staff: PMVZ. Sandra Cortes Amador.

Photographer: Marcela Woolrich.

Ethics Approval and Consent to Participate

All procedures performed in the study were in accordance with the ethical standards of Norma Oficial Mexicana NOM-062-ZOO-1999, Especificaciones técnicas para la producción, cuidado y uso de los animales de laboratorio. DOF 2001. http://dof.gob.mx/nota_detalle.php?codigo=757026&fecha=12/12/2001.

Conflict of Interest

The authors declare that they have no conflict of interest, and explicitly approve its publication.

Availability of Data and Materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Authors' Contributions

ARRP, Responsible for the project, coordination of activities, performance and assessment of cardiological studies, writing and sending to publication. DWB, Coordination of diagnosis, treatment and surgery. FPP, Chemical restraint in situ and coordination of activities. BBC, Support in echocardiographic studies. MLV, Sampling and hematological studies. AEVM, Methodological, editorial and translation advisor.

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