Cystic Endometrial Hyperplasia Complex (CECH)- Stump pyometra a literature review

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ABSTRACT

Cystic endometrial hyperplasia complex (CHEC) is an exaggerated response of the uterine endometrium to chronic progesteronic stimulation, resulting in the accumulation of exudate in the uterine lumen. The inflammatory process, which occurs in the uterus, is described as an exacerbated reaction of the endometrium to the repeated release of progesterone, caused by high levels of estrogen, which is responsible for maintaining cervical relaxation for longer in the luteal phase, resulting in the accumulation of fluids in the glands or in the uterine cavity. Stump pyometra occurs similar to classic pyometra, but is triggered by Remnant Ovary Syndrome (ORS), that is, the total non-removal of ovarian tissues. The retained ovarian tissue can implant in the abdominal cavity and vascularize, thus maintaining its functionality and secretion of estrogen and progesterone. Such production can occur cyclically, stimulating the remaining endometrium, leading to the accumulation of fluids within the stump and predisposing the female to a diestrus infection. The presence of progesterone can also be from drugs that have progesterone as a source, such drugs are used to treat dermatitis and urinary incontinence. Conclusion. The treatment established must be immediate and precise since the condition in the most severe cases can develop endotoxemia or sepsis at any time.

Keywords: Pyometra, Stump, Female dog.

1 INTRODUCTION

Cystic endometrial hyperplasia complex (CHEC) is one response exaggerated uterine endometrium in the face of chronic progesteronic stimulation resulting in the accumulation of exudate in the uterine lumen (QUESSADA et al., 2014). It commonly occurs during the luteal phase due to the high production of progesterone, thus stimulating the growth and secretory activity of the endometrial glands and reducing the contractile activity of the myometrium (OLIVEIRA, 2007 apud ALEIXO et al., 2011), but the endogenous administration of progesterone can also predispose (LIMA, 2019). It

occurs more frequently in than in cats, because feline ovulation is stimulated by copulation, that is, they have a low exposure to increased serum progesterone (BARNI, 2012).

The accumulation of exudate and inflammation caused in the uterus increases the chances of ascending bacterial infection, especially by Escherichia coli, leading to a severe endometrial infection with systemic involvement-pyometra (VEIGA, 2017). This disease is a common cause of death in female dogs (MOREIRA, 2008) when the diagnosis is made late and has a high lethality (JUNIOR, 2019).

Pyometra can present with the cervix open or closed, and the clinical signs vary according to presentation and severity, the most frequent being abdominal distension, pain on palpation, vaginal discharge that is limited to the open cervix, lethargy, anorexia, vomiting, fever, leukocytosis, hypotension, and septic shock (SCHWEIGERT et al, 2009), with ovariosalpingohysterectomy (OSH) as the most indicated treatment (NASCIMENTO. 2013).

Some complications may occur after OSH, such as remaining ovary syndrome due to non-total removal of the ovaries or the persistence of ovarian tissue remnants. (DEMIREL and ACAR, 2012, ATALLAH et al., 2013). Due to this failure, ovarian cycles may occur after OSH, leading to progesterone secretion, uterine stimulation and inflammation triggering stump pyometra (ALEIXO et al., 2011). Due to the difficult diagnosis of stump pyometra, the purpose of this study is to discuss its etiology, clinical signs, diagnosis and treatment, as well as its prevention.

2 DEVELOPMENT

Although Cystic Endometrial Hyperplasia (CHEC) is a common and routine case in veterinary clinics, there are still disagreements about the mechanisms that lead to the disease in question. However, there is a consensus that the lesions observed are due to hormonal interaction with bacterial influence (VOLPATO et al, 2012).

The development of CHEC can occur at any age, without breed predisposition, however, due to repeated estrous cycles and ovarian changes, it happens mainly in middle-aged to elderly animals (SALES et al, 2017), with having a higher incidence of the disease than cats. The pretext is that cats manifest the luteal phase only when they are induced to ovulate and, on the other hand, have this phase longer (BARNI; ALBUQUERQUE and CONTESINI, 2013).

The inflammatory process, which occurs in the uterus, is described as an exacerbated reaction of the endometrium to the repeated release of progesterone, caused by high levels of estrogen (FERRARI, 2008), which is responsible for maintaining cervical relaxation for longer in the luteal phase (OLIVEIRA et al, 2008), resulting in the accumulation of fluids in the glands or in the uterine cavity (LIMA, 2009).

Progesterone has several functions in the homeostasis of animals, as well as the stimulation of

the growth of endometrial glands, cervical closure and suppression of myometrial activity (MARTINS and LOPES, 2015), which can result in the accumulation of secretion, becoming a favorable culture medium for bacteria (SUGIURA et al., 2004).

The role of estrogen in CHEC is to maintain cervical relaxation for a prolonged period, as well as to intensify the functions of progesterone in the uterus (SILVA, 2013).

Due to the excess secretion, pus is formed in the uterine lumen, initiating the inflammatory process. The predominant bacterium involved is the uropathogenic *Escherichia colli*, in which its prevalence can reach up to 80% of cases (KREKELER et al., 2012).

In addition to *Escherichia colli,* there are other microorganisms isolated in the uterus in case of pyometra, which, like the predominant bacterium, are part of the vaginal flora, they are: *Staphylococcus aureus, Streptococcus spp., Pseudomonas spp. and Proteus spp.* (ETTINGER and FELDMAN, 2005).

There are two classifications of this pathology. In the first, the Sick women are divided into young people, when under six years of age, and old women, when they are over seven years old. For young females, the most credible explanation for the development of CHEC is the therapeutic method of exogenous administration of estrogen and progesterone. For the elderly, it may refer to the long and repeated stimulation of progesterone during the diestrous phases throughout the animal's life (SILVA, 2010).

Silva (2010) also describes the second classification based on the presentation of the cervix, which can be open or closed. In the open cervix, there is vaginal discharge without exaggerated dilation of the uterine horns, the wall of the uterus It is thickened with hypertrophy and fibrosis and myometrium. On the other hand, in the closed cervix, the female presents with abdominal distension due to the extensive dilation of the uterus, with the uterine walls being thin and without vaginal discharge. Concomitantly, the endometrium will be atrophied and infiltrated by lymphocytes and plasma cells (SILVA, 2010; SMITH, 2006). Stump pyometra occurs similar to classic pyometra (described above), but is triggered by Remnant Ovarian Syndrome (ORS), i.e., the non-total removal of ovarian tissues (VIJAYAKUMAR et al., 2018). This failure can occur for several reasons, inadequate placement of hemostatic forceps, erroneous ligation, poor visualization, dropping some portion of ovarian tissue into the cavity, atypical location of residual ovarian tissue (COPAT et al., 2015). Unbiased removal may also be a surgeon's choice to prevent the possible side effects of ovariohysterectomy, such as excess appetite and obesity, thus leaving one of the ovaries intact (TSS and TUNA, 2005).

The retained ovarian tissue can implant in the abdominal cavity and vascularize, thus maintaining its functionality and secretion of estrogen and progesterone (SONTAS et al., 2009). Such production can occur cyclically, stimulating the remaining endometrium, leading to the accumulation of fluids within the stump and predisposing the female to a diestrus infection (MAGEE, 2016).

Vasconcelos (2014) states that the presence of progesterone can also be from drugs that have progesterone as a source, such drugs are used to treat dermatitis and urinary incontinence.

The clinical signs of stump pyometra are similar to classic pyometra and may be related to ORS. Among the clinical signs associated with pyometra, vaginal discharge, hyperthermia, lethargy, hyporexia or anorexia, weight loss, emesis, polyuria, polydipsia, and abdominal enlargement are the main ones (COUTO, 2019). On the other hand, the signs related to ORS result from the production of ovarian hormone, characteristic signs of proestrus and estrus, vulvar edema, bloody vaginal discharge and behavioral changes, cystic endometrial hyperplasia, endometritis, vaginitis, and vaginal neoplasia (PEREIRA et al., 2018; NIMWEGEN et al., 2018). Sontas (2009) also shows signs of pseudocyesis and mating without fertility. The appearance of signs can occur up to 11 years after the procedure (NIMWEGEN et al., 2018).

The diagnosis of this pathology is made through a compilation of information obtained through anamnesis, clinical signs, complete blood count, abdominal ultrasound, vaginal cytology, hormonal dosage and exploratory laparotomy with biopsy (SONTAS, 2009), the last three being specific for the diagnosis of remnant ovary. It is recommended that laparotomy be performed during estrus, as the presence of ovarian follicles facilitates the identification of the ovary, and histological evaluation of the excised tissue is performed for the definitive diagnosis of ORS (PEREIRA et al., 2018).

Luteal phase progesterone (P4) levels above 3.36 nmol/I confirm the suspicion of ORS, but if the result is negative and the suspicion continues, the Gonadotropin-Releasing Hormone (GnRH) stimulation test can be performed to confirm (NIMWEGEN et al., 2018).

The ultrasound image of stump pyometra does not have a pattern in relation to its shape, size or echotexture, and smaller lesions are more difficult to diagnose and a great challenge without this aid (KUMAR et al., 2008), but this evaluation is not always reliable depending on the location of the remaining tissue and its amount and size. The measurement of Anti-Mullerian Hormone (AMH) for the diagnosis of ORS is a new test, but it can be used in these cases due to its good sensitivity in this detection (MAGEE, 2016).

AMH is a glycoprotein hormone produced by the cells of the ovarian granulosa that after castration its production ceases and its serum concentration drops to an almost zero level, not interfering with the ovarian cycle or hormones gonadotropins (YILMAZ, 2015) thus showing that this can be an alternative and reliable method for the diagnosis of ORS since many alternatives can be unreliable, expensive, technically demanding or time-consuming.

The treatment established must be immediate and precise, since the condition in the most severe cases can develop endotoxemia or sepsis at any time (SANTOS, 2019).

In order to ensure the best prognosis, there are two paths to follow, which consists of the therapeutic drug resource or surgical intervention, in which Ovariectomy is performed (CABRAL et

al., 2016). However, these two pathways should be associated with antibiotic therapy, with the aim of reducing the infectious load present (TRAUTWEIN et al., 2017), with amoxicillin being the most used in these cases and, when associated with potassium clavulanate, increases its spectrum of action against bacteria (PEREIRA, 2011).

In hydroelectrolyte disorders and acid-base imbalance, fluid therapy should be performed continuously during the clinical or surgical treatment of the patient, in order to improve renal perfusion (SANTOS, 2019).

The prognosis is favorable after surgery, Conrado (2009) describes that only 5% to 8% of patients die intraoperatively or soon after the procedure is performed.

Prevention consists of the surgical removal of the female reproductive organ, i.e., OSH, since it brings, in addition to the prevention of CHEC, other favorable factors for the animal. Sousa and Florencio (2019) cite as benefits of early OSH the control of endocrine diseases, elimination of persistent estrus, dystocia, estrogen-dependent diseases, abortions, prevention of breast, ovarian, and uterine tumors, hyperplastics, and unwanted behaviors due to pseudocyesis, in addition to the issue of public health and population control of a certain species.

3 CONCLUSION

After the elaboration of this work, it can be concluded that the Cystic Endometrial Hyperplasia Complex is a routinely common pathology to be found in veterinary clinics, and it is of great relevance to know about this disease, because, as already clarified, when not If identified and treated urgently, it can lead to the animal's death.

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