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Sub-involution of placental sites (SIPS): An overview

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Abstract

Sub-involution of placental sites (SIPS) is a disorder which generally occur in bitches of younger than three years of age after the first whelping when normal healing of the sites of placenta where fetuses attached to the endometrium does not occur and is characterized by the freshly discharged blood from the vulva from several weeks to months post partum. Prolonged or premature parturition may be the predisposing factor to SIPS. Diagnosis of SIPS is based on the history and clinical sign of disease. Vaginal smear and ultrasonography can also be deployed as diagnostic tool. Vaginal cytology has practical application in the evaluation of trophoblastic cells finding indicative of SIPS. However, the most appropriate confirmative tool of diagnosis is the biopsy and histopathology of the affected uterus. Single shot of medroxyprogesterone through parenteral (S/C) route is the best studied treatment till date.

Keywords: SIPS, bitch, pregnant, ultrasonography, biopsy, Trophoblast

Introduction

Sub-involution of placental sites (SIPS) is a disorder that appears when delay in uterine involution occurs and is characterized by prolonged hemorrhagic vaginal discharge after parturition (Johnston *et al.*, 2001) ^[10]. Sub-involution of placental sites in a bitch was reported first in 1966 (BECKA, 1966) ^[6]. Sub-involution of placental sites (SIPS) occurs when normal healing of does not take place at the sites of the placentas of the fetuses attached to the wall of endometrium. It is characterized by a fresh bloody discharge passing from the vulva. The discharge may for several weeks or months (7 to 12 weeks) post-partum.

This condition occurs mostly in bitches younger than three years of age following the first whelping (Al-Bassam *et al.*, 1981a, b; Olson *et al.*, 1984; Johnson, 1989) ^[1-3, 12, 13, 9]. Physiological vaginal discharge after delivery lasts normally for approximately three weeks. If haemorrhagic vaginal discharge is prolonged beyond these three weeks, it refers as SIPS (Orfanou *et al.*, 2009) ^[14].

The pathogenesis of SIPS is not well known. However, Johnston (2001) ^[10] describes that in bitches with SIPS, trophoblastic cells do not regress or degenerate normally, instead they continue to invade deep into the glandular layer or even into the myometrium, preventing normal involution. Normally, the lining of the uterus (endometrium) repairs itself once the placenta tears away from the wall as the puppy is born (Slatter, 1985) ^[17].

Diagnosis exclusively done by the history and the clinical signs. Some other diagnostic tools such a vaginal smear, abdominal ultrasound and uterine biopsy have been considered. Regarding to vaginal smear, trophoblastic-like cells can be observed (Reberg SR 1992) ^[15]. On the other hand, (Orfanou *et al.* 2009) ^[14] stated that the presence of trophoblast-like cells in a vaginal smear up to 84 days after parturition can be considered normal. Vaginal smear is not the best diagnostic approach for SIPS. Abdominal ultrasound can show an enlarged fluid-filled uterus. But always ultrasonography does not always provide a conclusive diagnosis. A conclusive best diagnosis can be only obtained by biopsy and further histopathology of the affected uterus. There is one report of spontaneous recovery also. (Schall *et al.*, 1971) ^[16]

Etiology

It was reported that any form of premature parturition, uterine inertia, infection, mineral and vitamin deficiencies were incriminated as predisposing to retention of placenta in cattle (Fitzpatrick, DBR 1988/89).

Prolonged parturition

- A. Obesity (fatigue and poor muscle tone)
- B. Ca-Zn deficiency (abnormal ration: Calcium↑, Zinc↓)
- C. Subclinical hypoglycemia
- D. Subclinical hypocalcemia (slow initiation of labour)
- E. Dystocia
- F. Uterine inertia (primary and secondary)
- G. Uterine torsion

2. Premature parturition

- A. Abortion (E. coil, *Brucella canis*)

Clinical Signs

SIPS occurs often in the young bitch, usually after the first pregnancy. Bitches with SIPS usually appears to be healthy in all respects except for a pinkish sanguineous vulvar discharge passing from the vulva for several weeks postpartum. Condition took the form of excessive uterine bleeding (metrorrhagia) post-partum and, of prolonged vaginal discharge lasting 8-13 weeks post-partum. Duration is variable, lasting a few weeks in some cases but persisting to the next proestrus in many others. SIPS most commonly occurs after a normal delivery and litter size, with healthy pups (Al-Bassam *et al.*, 1981a; Johnston *et al.*, 2001; BECKA, M., 1966) [3, 10, 6].

Differential diagnosis from

Persistent pinkish sanguineous vulvar discharge postpartum in female dogs can be due to numerous causes, including trauma, genital tract neoplasia, endometritis, brucellosis, coagulopathy and sub-involution of placental sites (SIPS) [Johnston *et al.*, 2001] [10].

Diagnosis

The diagnosis of SIPS is done by the basis of historical and physical findings, cytologic findings and histopathological examinations generally (Al-Bassam *et al.*, 1981b) [1, 2].

Vaginal Smear Test-Regarding to vaginal smear, trophoblastic-like cells can be observed in smear. Eighter its absence does not rule out the presence of SIPS. Trophoblast cells are polynucleated and heavily vacuolated and could be observed in the vaginal smears from bitches with SIPS (Arbeiter & Dickie 1993) [4].

Abdominal Ultrasound- B mode ultrasound examination of the abdominal cavity was performed with an 11-13 MHz high-frequency linear transducer (Mylab 70, ESAOTE, Genova, Italy). In abdominal ultrasound may show an enlarged fluid-filled uterus with a more or less heterogeneous content and enlarged implantation sites. Ultrasonography does not always provide a conclusive diagnosis. An abdominal ultrasound, and abdominal palpation, are done to assess the size of the uterus and to rule out the possibility of retained fetuses or placental material. Presence of excess the fluid within the uterus is more suggestive of an inflammation or infection of the uterus rather than SIPS (MM Rivera del Alamo 2017; Dickie *et al.*, 1993) [11, 7].

Uterine biopsy-Definitive diagnosis of SIPS can be made by a pathologist examines a biopsy of uterine tissue, but uterine biopsies are rarely done. Endometrial epithelium showed papillary and tubular projections into the uterine lumen. These projections penetrated into the lamina propria and the

muscular layers. In the apical zone, the projections showed the presence of fibrin, erythrocytes and degenerated inflammatory cells. Endometrial lamina propria was oedematous and with small haemorrhagic areas and infiltrates, mainly lymphoplasmacytic. Lymphatic vessels were distended and both endometrium and myometrium showed diffuse congestion. Histology showed endometrial glands invaded by trophoblastic cells (Dickie *et al.*, 1993) [7].

Treatment and Discussion

Treatment with different antibiotics have had no results in bitches with SIPS (Schall *et al.*, 1971; Beck *et al.*, 1966) [16, 6], seven-day course with 8 µg/kg twice daily of methylergometrine hydrogen maleate orally resulted in no improvement in clinical signs (Sontas *et al.*, 2011) [18]. Medical treatment with oxytocin or careful use of megestrolacetate however, but no further information on results with this treatment is given (Arbeiter, 1993) [4]. Another study where bitches with persistent postpartum uterine hemorrhage were treated with a single subcutaneous dose medroxyprogesterone acetate suspension (2 mg/kg bodyweight) vulvar discharge disappeared on day three (Arbeiter, 1975) [5].

Daily administration of megestrolacetate over 2 weeks may be superior to single-dose parenteral administration, although optimal duration of treatment has not been studied yet. Treatment with megestrol acetate in a dose of 25-50 mg subcutaneous in combination with antibiotics intrauterine diminished the symptoms of vulvar discharge within 3-5 days (Dickie MB *et al.*, 1993) [7].

A fast and successful treatment of postpartum uterine bleeding and sub-involution of placental sites was injection of a single dose of 25 to 50 mg of medroxyprogesterone. (Sontas *et al.*, 2011) [18].

Conclusion

SIPS is most unusual clinical finding of recently whelped bitches of less than three year of age characterized by bloody discharge from vulva beyond three weeks when normal healing of does not take place at the sites of the placentas of the fetuses attached to the wall of endometrium. Obesity, Ca-Zn deficiency, Subclinical hypoglycemia, Dystocia and Uterine inertia are the common etiological factors associated for SIPS. Ultrasonography of abdomen and vaginal explorative cytology are the most regular methods used to diagnosed the condition. Rather the uterine biopsy and histopathology is most confirmative approach to confirm the diagnosis.

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