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## Management of foetal maceration in a two-year-old Caucasian bitch

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### Abstract

Foetal maceration is a pregnancy pathology that develops after foetal death and is characterized by septic decomposition of soft tissues, leaving behind hard tissues within the uterus. A two-year-old Caucasian bitch weighing approximately 35 kg was presented to the Small Animal Unit of the University of Maiduguri Veterinary Teaching Hospital with the complaint of being off feed, dark brown discharges through the vulva and an absence of visible signs of pregnancy after mating with a proven sire two months earlier. Reproductive history revealed that the bitch had an uneventful gestation and parturition a year earlier. The body temperature (39.4°C), pulse rate (96 bpm) and respiratory rate (29 cpm) were all within normal range. The bitch was observed to have a slightly pale mucous membrane, oedematous vulva with dark brown foul-smelling vulval discharges and a slightly enlarged abdomen. Haematological results revealed the presence of macrocytic hypochromic anaemia coupled with basophilia. Pelvic ultrasonography showed a distended uterus characterized by a mixture of anechoic, hypoechoic and hyperechoic areas with no viable foetus. The case was successfully managed through surgery. This report brings attention to the subclinical nature of foetal death, highlighting the significance of routine monitoring of animals after breeding and throughout pregnancy.

**Keywords:** Bitch, Caucasian, Foetal maceration, Management, Surgery

### Introduction

Foetal maceration is an abnormality that occurs during gestation as a result of intrauterine foetal death and failure of complete expulsion of the dead foetus. Failure to expel the foetus may partly be due to insufficient dilatation. Concurrently, there is infiltration by a pathogenic bacterium through the

slightly dilated cervix (Garcia & Azorit, 2023). The climax is putrefaction and autolysis of foetal soft tissues, leaving foetal hard tissues within the uterus (Omirinde *et al.*, 2024). This condition can occur at any stage of gestation but is usually more common in mid to late gestation (Garcia & Azorit, 2023).

Although the prevalence of foetal maceration is reported to be very low in dogs (possibly due to expulsion of foetus being the commonest sequel to foetal death), the condition has frequently been reported in bitches (Omirinde *et al.*, 2024; Opaluwa-Kuzayed *et al.*, 2024). The consequence of this condition is that the future fertility of the affected animal is doubtful, as the longer the condition lasts, the greater the damage to the endometrium and the prognosis gets worse (Bhattacharyya *et al.*, 2015). This case report describes an uncommon case of foetal maceration in a Caucasian bitch and its successful surgical management.

### Case Management

#### Case history and clinical examination

A 2-year-old Caucasian bitch weighing approximately 35kg was presented to the Small Animal Clinic of the University of Maiduguri Veterinary Teaching Hospital with the chief complaint that the bitch had been off feed, there was also dark brown discharges through the vulva and an absence of visible signs of pregnancy after mating with a proven sire two months earlier. Reproductive history revealed that the bitch had pregnancy and she whelped without complications a year earlier. A detailed clinical investigation (haematology and pelvic ultrasonography) was

carried out on the bitch. The bitch was observed to have a slightly pale mucous membrane, a dry muzzle, oedematous vulva with dark brown foul smelling vulval discharge and a slightly enlarged abdomen. The rectal temperature of 39.4°C, pulse rate at 96 beats per minute and respiratory rate at 29 cycles per minute were obtained (Table 1).

#### Laboratory results

Blood sample (2mL) from the cephalic vein was collected in EDTA vacutainer tube (Narang Medical Limited, New Delhi, India) for full blood count. Determination of packed cell volume (PCV), haemoglobin concentration (HB), Red blood cell (RBC) counts, and total white blood cell (TWBC) counts was performed using standard laboratory guidelines (Thrall *et al.*, 2022). Erythrocytic indices were calculated using a standard formula (Harvey, 2012). Thin blood smears for differential WBC counts were routinely prepared, stained with Wright-Giemsa stain and examined under oil immersion (Harvey, 2012). The haematology results showed that the bitch had macrocytic hypochromic anaemia coupled with basophilia when compared with reference values (Table 2). In addition, pelvic ultrasonography using a 5MHz trans-abdominal transducer revealed mixed echogenic areas (Plate I), including a hyperechoic

**Table 1:** Patient's vital parameters during clinical examination

Parameters	Values	Reference Values*
Temperature	39.4°C	37.5-39.4°C
Pulse Rate	96 beats /minute	60-100 beats/minute
Respiratory Rate	29 cycles /minute	10-30 cycles beats/minute

\*Source: Reece *et al.* (2015)

**Table 2:** Patient's preoperative haemogram

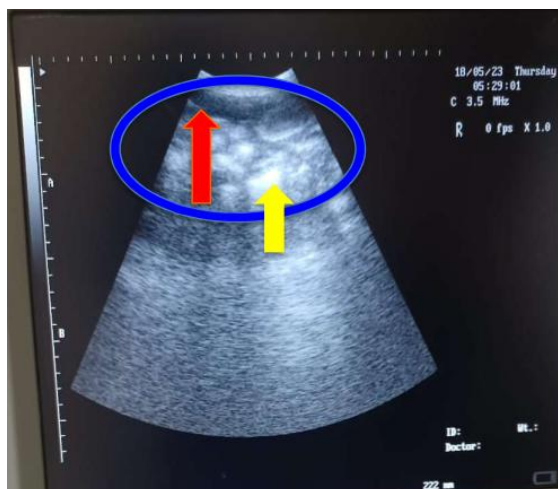
Parameters	Patient's value	Reference Values
PCV	36	37-55
Hgb	12.0	12.4-19.1
RBC	4.1	5.2-8
MCV	87.8	62.7-72
MCH	29.3	22.2-25.4
MCHC	33.3	34-36.6
Platelets	0	16-525
WBC	10.7	5.4-15.3
Neutrophil –Band	0	0-150
Neutrophil –Mature	6955 (65%)	2750-12850 (51-84%)
Lymphocytes	2675 (25%)	430-5899(8-38%)
Monocytes	749 (7%)	50-1400 (1-9%)
Eosinophils	0	0-1400 (0-9%)
Basophils	321(3) %	0-1%

\*Source: Reece *et al.* (2015)

area suggestive of foetal hard tissues, a hypoechoic area indicating soft tissues and anechoic pointing to intra-uterine fluid (Plate I). The combination of the history, findings from both physical examinations and ultrasonography steered our conclusion that the bitch had a retained foetus undergoing intra-uterine autolysis, and the case was diagnosed as foetal maceration. This informed our decision to undergo exploratory surgery on the uterus.

**Management**

Standard pre-operative preparation for caesarean section was carried out. Briefly, for pre- anaesthetic medication, induction and maintenance agents consisting of 1% atropine sulphate administered at 0.2mg/kg, i/v; 5% ketamine hydrochloride at 15mg/kg, i/v and 2% xylazine at 2mg/kg, i/v, respectively, were used. An incision on the linea alba was made and then followed by blunt dissection of the subcutaneous tissues, underlying musculature of the peritoneum. The ovaries, uterine horns, uterus and segment of the cervix were then exteriorised (Plate II A). The right



**Plate I:** Sonographic visualisation of foetal parts. Pelvic ultrasonic image showing mixed echogenicities, blue circle (yellow arrow pointing to hyperechoic and red arrow pointing to hypoechoic areas within the uterus



**Plate II:** Steps during surgical procedure. A. Exteriorised uterus in the bitch, noting the congested areas on the uterine horn (red arrow). B. The macerated foetal parts (white arrows). C. suturing of the uterus using Cushing's suture pattern. D. Skin closure using an interlocking suture pattern and application of Oxytetracycline HCl spray

uterine horn was incised, and the macerated foetal parts were evacuated (Plate IIB), and the uterus was flushed with normal saline, and Ceftrazone was administered IV at 30mg/kg. Closure of the surgical site was done using Cushing's suture pattern with chromic catgut suture material size 2 (Plate II C). Musculature was sutured using a simple continuous suture pattern with chromic catgut, and subcutis was closed using a simple continuous suture pattern. Finally, the skin was closed using an interlocking suture pattern with non-absorbable silk suture material and application of Oxytetracycline HCl spray on the site of incision (Plate IID). Post Operatively, amoxicillin 20mg/kg (0.7mL) I.M, vitamin B complex (1.5ml) IM 3/7, piroxicam 0.3 mg/kg, IM 2/7, and Iron-Dextran (1.5ml) IM 3/7 were administered. The bitch was presented for post-operative medications, and suture removal was done after 14 days.

### Discussion

Cases of foetal maceration in bitches are usually accompanied by foul and foetid uterine discharge. The bitch in this case was observed to have dark brown, foul-smelling vulval discharges. This is also consistent with the nature of discharges from bitches with foetal maceration as earlier reported (Omirinde *et al.*, 2024; Opaluwa-Kuzayed *et al.*, 2024). Temperature, pulse and respiratory rates were also found to be within normal range in this bitch, and this is also consistent with a recent report (Omirinde *et al.*, 2024; Opaluwa-Kuzayed *et al.*, 2024), although pyrexia has been associated with foetal maceration (Erdogan *et al.*, 2019). The bitch also had a macrocytic hypochromic anaemia coupled with basophilia. Pregnancy in canines has been reported to be responsible for haematological changes, including anaemia, a low haemoglobin concentration and a reduction in red blood cell counts (Kimberely *et al.*, 2006). The anaemia, low haemoglobin count and low red blood cell counts observed in this case agree with earlier reports. Low haemoglobin count and anaemia in this case may be associated with parasitemia and perhaps poor production of red blood cells due to insufficient nutrients (Vitamin B12 and Iron), and basophilia also seen in this case could well be associated with parasitism (Held & Mochizuki, 2023) as the bitch was recently treated for parasitism. Despite strong bacterial contamination and proliferation involved in foetal maceration, most affected animals do not experience septicemia as the endometrium has the potential to heal swiftly after placental separation. Rarely does the process of foetal maceration lead to severe sepsis or death

(Erdogan *et al.*, 2019). Early detection of foetal death and prompt removal of foetal remnants are important for guaranteed reproductive health. Here in this case report, we described a case of foetal maceration in a caucasian bitch without noticeable clinical signs. This bitch was not known to have aborted.

In conclusion, this report is a presentation of foetal maceration probably arising due to early foetal death in-utero. Early and precise diagnosis of foetal debris using radiography, ultrasonography and surgical approach can help in ensuring an early diagnosis and successful management in affected animals. This report brings attention to the potential subclinical nature of foetal death, highlighting the importance of continuous monitoring after breeding and throughout pregnancy.

### Conflict of Interest

The authors declare that there is no conflict of interest.

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