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Fetal mummification in a cow with twin gestation and retention of the fetuses in the vagina: a case report[1]

Mumificação fetal em uma vaca com gestação gemelar e retenção dos fetos na vagina: relato de caso

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Abstract – This article describes the case of a 59-months old Brown Swiss cow raised in a semi-arid region of the Brazilian Northeast, with two mummified fetuses in the vagina. According to the herd records, the cow was at the seventh month of its second gestation when the fetuses were found in the vagina. The cow showed normal signs of estrus, such as mounting activity. The uterine horns showed no asymmetry and were contractile and turgid and there was no pus secretion from the vagina. Also, a pre-ovulatory follicle (18.5 mm) was present on the right ovary. The two mummified fetuses were confirmed to be males, measuring 12.1 cm and 11.5 cm, each. The mummification in this case is probably classified as "hematogenous", once the fetuses were partially dry but not very hard covered with a bloody and viscous tissue. Release of fetuses from the uterus to the vagina allowed a normal involution of the uterus to its normal size, regression of the corpus luteum and return of hypothalamic-hypophyseal and gonadal activity, confirmed by the estrous behavior. After fetuses had been removed from the vagina, the cow received two doses of oxitetracycline at an interval of 48 hours to prevent uterine infections. The cow was observed in estrus 20 days later, inseminated and confirmed pregnant at 40 days of gestation by palpation per rectum.

Index terms: dairy cow, gestation, mummified fetuses.

Resumo – Este artigo descreve o caso de uma vaca Pardo Suíço de 59 meses, com dois fetos mumificados na vagina, ocorrido na região semi-árida do Nordeste brasileiro. De acordo com os registros reprodutivos do rebanho, a vaca estava no sétimo mês da sua segunda gestação quando os fetos foram encontrados na vagina. A vaca mostrou sinais normais de estro, bem como atividade de monta. Os cornos uterinos não apresentavam assimetria, estavam contráteis, túrgidos e não havia secreção vaginal purulenta. Entretanto, um folículo pré-ovulatório (18,5 mm) foi detectado no ovário direito. Foi observado que os dois fetos mumificados eram machos, medindo 12,1 cm e 11,5 cm. A mumificação, neste caso, é classificada provavelmente "hematógena", porque os fetos apresentavam-se parcialmente secos, mas não muito rígidos e cobertos por um tecido viscoso e sanguinolento. A saída dos fetos do útero para a vagina permitiu uma involução uterina normal, regressão do corpo lúteo e retorno da atividade hipotalâmica-hipofisária-gonadal, confirmado pelo comportamento de estro. Após a remoção dos fetos da vagina, a vaca recebeu duas doses de oxitetraciclina, com intervalo de 48 horas, para prevenção de infecção uterina, sendo observado estro 20 dias depois e realizada Inseminação Artificial (IA), com confirmação de gestação aos 40 dias por palpação retal.

Termos para indexação: vaca leiteira, gestação, fetos mumificados.

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Introduction

According to several authors (Arthur, 1979; Buergelt, 1997; Grunert & Birgel, 1982; Nascimento & Santos, 1997; Santos, 1979), mummification relates to a series of morphological modifications that occurs to a fetus that dies and is kept in the uterus after the first third of gestation. In animals with single ovulation, like cows and mares, mummification is associated with a functional corpus luteum in the ovary and, in the case of multiparous females (sow, bitch, etc.) it is also possible that mummified and normal live fetuses are present at the same time in the uterus (Grunert & Birgel, 1982).

Although the exact causes of fetal death followed by mummification have not been completely determined, events such as infection, trauma, uterine torsion, bad nutrition and genetic problems may certainly contribute to the arrest of a normal gestation (Arthur, 1979; Grunert & Birgel, 1982). The occurrence of fetal mummification in cows is very low (0.43 to 1.8%) but it usually occurs between three and eight months of gestation, being more frequent between fourth to sixth month (Roberts, 1971). Mummification can be of two different types: "papiraceous" or "hematogenous" (Santos, 1979). In the first case, there is absorption of the placental fluids and the fetal membranes attach to the dehydrated fetus, allowing the formation of a dark tissue, with a humid external surface, but without odor or secretion (Arthur, 1979; Nascimento & Santos, 1997, Santos, 1979). Differently from other species, cows are more susceptible to "hematogenous mummification", where the fetus appears covered by a dark and viscocious substance, consequence of blood metabolization (Toniollo & Vicente, 1993). Moreover, in the case of "hematogenous, mummification", when the placenta or maternal caruncules regress, a hemorrhage occurs between the endometrium and fetal membranes and, after plasma is reabsorbed, there is a formation of viscocious, thick and dark brown tissue, with mucus and clots (Arthur, 1979; Santos, 1979).

The retention of a mummified fetus in the uterus is associated with a functional corpus luteum and no signs of estrus (Roberts, 1971). In the cow, the fetus may be kept in the uterus from three to twenty-four months (Grunert & Birgel, 1982) and are usually detected during routine reproductive examinations (Arthur, 1979). This article reports, thus, a unique case of twin mummification fetuses that were released from the uterus and detected in the vagina. The fetuses were found when the cow was presenting estrus behavior.

Material and Methods

Experimental design

The case was detected in a Brown Swiss cow with 59 months of age, raised at the Experimental Station of the Federal University of Ceará, located in a semi-arid region of the Brazilian Northeast (latitude: 3º 47'; longitude: 39º 17'). The average rain fall at the farm is 786.7 mm/year (mostly between February and May) and a long dry season that lasts up to seven or eight months. Throughout the year, the average air temperature is 27.1ºC. In the dry season, the temperature reaches a maximum of 35.3ºC during the day, but associated with low humidity (44.3%), and the temperature goes to an average of 22.4ºC at night, with higher humidity 78.8%.

In October of 2002, the cow was at the seventh month of its second gestation, but showed signs of estrus, such as mounting activity by other cows and by a teaser bull, and by presence of clear mucus released from the vagina. The cow was submitted to a gynecological examination with aid of ultrasonographic technique, using a Pie Medical, Falco Vet 100 with an 8 MHz rectal probe. At that time, the animal was in the group of dry cows and was being fed a diet with elephant grass, corn silage and concentrate containing ground corn, wheat and soybean meal, cashew nut, mineral and vitamin supplement and urea (2% of concentrate dry matter) Also, the animal was kept in a shaded barn with free access to an unshaded area with sand. Additional mineral supplement and water was provided "ad libitum".

Results and Discussion

The cow had normal respiration and cardiac rates and rectal temperature (38.7°C) and there were no signs of acute stress. Mucosa of the mouth, eyes and vagina appeared normal and the animal also had normal feed intake. When the gynecological examination was realized, at rectal palpation, an almost hard material was detected in the vagina, but the uterine horns had no asymmetry and were contractile and turgid. Also, a large follicle was present in the right ovary. The ultrasound examination confirmed the pre-ovulatory follicle (18.5 mm) in the right ovary (Figure 1) as well as the presence of non-uniform echogenic tissue in the vagina. Also, ultrasonography showed that there was no fluid retention in the uterine horns. After palpation per rectum and ultrasound exam, two fetuses attached to the placentas and covered by a viscocious and dark brown material was recovered from the vagina (Figure 2a). After removal of the placentas, the two mummified fetuses were confirmed as being males, measuring 12.1 cm and 11.5 cm from the atlanto-occipital articulation to the tail insert; (Figure 2b). Right after removal of the fetuses, the cow was treated with two doses (i. v.) of oxitetracycline (Reverin Plus; Intervet, Brazil) at 48-hour intervals to prevent uterine infection. Twenty days later, the cow was detected in estrus again, inseminated and confirmed pregnant 40 days afterwards.

Figure 1. Pre-ovulatory follicle, at the day of estrus, of a cow that had mummified twin fetuses in the vagina.

Twining births in the bovine species is around 1% in beef herds and 5.02% in dairy herds (Johanson et al., 2001) and mummification is an event that is even rarer in that species ranges from 0.13 to 1.8% (Barth, 1986). Thus, the occurrence of fetal mummification associated with gestation of twins is even more unexpected and nobody had not been reported before in the literature. Based on the aspect of the fetuses and membranes, it may be suggested that the mummification described here is "hematogenous", i. e., the fetuses appeared partially dry but not very hard, and covered with a bloody and viscous tissue (Arthur, 1979; Santos, 1979; Roberts, 1971).

In some cases, mummification of the fetus can lead to total expulsion of fetus dead before the expected time for labor (Roberts, 1971) or the fetus can be partially expelled from the uterus and remains in the cervix or vagina (Arthur, 1979). However, the case described in this article is an abnormal occurrence, a rare phenomenon, i. e., the release of twin mummified fetuses from the uterus to the vagina, where they were hold for a long period of time without any apparent clinical consequences, and the cow being in estrus. Based on the date of service, the cow was approximately at the seventh month of gestation and, according to their size, the fetuses died at the age of three months. Whether these fetuses were expelled from the uterus to the vagina right at that time or later it can not be exactly determined but this change of location of the fetuses allowed a normal involution of the uterus to its normal size, regression of the corpus luteum and return of hypothalamic-hypophyseal-gonadal activity, confirmed by the estrus behavior of the about four months after the estimated date when the fetuses died were retained in the vagina. Thus, it can also be hypothesized that, in this case, there was an efficient mechanism that separates uterine function from the vagina.

Figure 2 – Mummified fetuses recovered from the vagina of a Brown Swiss cow.a) and b).

The uterine environment must be free of bacterial contamination and isolated from the vagina by a closed cervix in order to allow the mummification of a fetus in the uterus (Jalakas, 2000). Thus, there are in this case two possibilities. Firstly, it is possible that mummification actually happened in the uterus and then the mummified fetuses were released to the vagina when there was still time for the uterus to return to its normal size. Another hypothesis would state that the fetuses were quick released from the uterus after death and mummification occurred in the vagina itself but the question in this case is whether the vagina can maintain an environment like the gravid uterus. The vagina is a tubular organ with great elasticity and, therefore, could keep the mummified fetuses and placentas released from the uterus, but the function of its immunological capabilities are still not completely elucidated.

Jalakas (2000) described a case of a mummified placenta in the vagina of a cow for a long period of time; he suggested that the organ could maintain after calving a sterile environment. The strong contractile mechanism located at the vagino-vestibular junction would thus prevents the entry of pathogens to vaginal canal but more detailed studies need to be carried out to confirm this hypothesis. This characteristic of the vagina could also explain the fact that there was no infectious secretion from the vagina while the mummified fetuses were there.

The prognosis for rebreeding of the female is good and in most cases female conceives one to three months after expulsion of a mummified fetus (Barth, 1986). In this case, the cow returned in estrus twenty days after fetuses' removal becoming pregnant again. It means that the uterus environment was morphological and physiological normal, permitting the cow return to cyclicity in a short period of time.

Conclusion

In conclusion, this article discusses for the first time a case of a hematogenous mummification, where there was expulsion of twin fetuses and retention of these fetuses and placentas in the vagina for several months. That series of events apparently allowed normal uterine involution and subsequent return of the cow to cyclicity and rebreeding.

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