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Mammary adenocarcinoma in a mare

Adenocarcinoma mamário em égua

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- NOTE –

ABSTRACT

A non-lactating 17-year-old grey barren Mangalarga Marchador mare was referred to the Large Animal Veterinary Hospital of the Federal Rural University of Rio de Janeiro (UFRRJ), presenting enlargement of the mammary gland. The owner reported that the animal had a lesion in the mammary gland for at least two years, diagnosed and treated as chronic mastitis. Initially only the right gland was involved, presenting ulceration and exudation on the cutaneous surface. After 20 months, the left gland also became affected. The diagnosis of tubulo-papillary adenocarcinoma was based on the typical microscopic lesions. This work shows the importance of the histopathological examination in the differential diagnosis between the neoplasms and the chronic inflammation in the mammary gland of mares, as well as, to show that the cytological examination cannot detect the tumor, in case the puncture is made in areas of secondary infection.

Key words: *equine diseases, mammary neoplasms, mastitis.*

RESUMO

Uma égua tordilha, Mangalarga Marchador, de 17 anos, não-lactante e não-prenhe, foi encaminhada ao Hospital de Grandes Animais da Universidade Federal Rural do Rio de Janeiro, com histórico de mastite crônica há dois anos. No início da lesão, apenas a glândula mamária direita estava muito aumentada, com exsudação sero-hemorrágica e ulcerada. Após 20 meses, a mama esquerda também estava comprometida. A égua foi tratada para mastite crônica, porém o exame histopatológico revelou tratar-se de um adenocarcinoma túbulo-papilar. Este trabalho evidencia a importância do exame histopatológico no diagnóstico diferencial entre neoplasias e inflamação crônica da mama de éguas, uma vez que o exame citopatológico pode não detectar o tumor, quando a punção é feita em áreas de infecção secundária.

Palavras-chave: *neoplasias mamárias, doenças de eqüinos, patologia veterinária.*

Mammary gland neoplasms are extremely rare in cow, goats, sheep, and horse (MISDORP, 2002). In mares, the few reported tumors have been scirrhous solid carcinomas which have been extremely invasive locally, and all have had widespread metastasis (YAGER & SCOTT, 1993). Mammary neoplasms are the most frequent tumors in bitches and form the third most frequent group in queens (MISDORP, 1999).

A non-lacting 17-year-old Mangalarga Marchador mare was referred to the Large Animal Veterinary Hospital of the Federal Rural University of Rio de Janeiro (UFRRJ), presenting enlargement of the mammary gland with subcutaneous ventral edema. The owner reported that the animal had a lesion of the mammary gland for at least two years, diagnosed clinically as mastitis. Initially, only the right gland was

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involved, presenting ulceration and exudation on the cutaneous surface. After 20 months, the left gland also became affected (Figures 1 A and B). Cultures and antibiograms revealed initially the presence of ***Staphylococcus aureus*** and, in a second culture, ***Klebsiella*** *sp.* The animal was treated with several local (gentamycin) and systemic antibiotic (ciprofloxacin, vancomycin) for a prolonged period (15 days each) but there was no improvement; the cutaneous ulcers healed and recurred afterwards. The mare was not raised as a breeding animal, however had one foal in the beginning of the process that nursed from the non-affected gland.

The mare was examined clinically and showed a poor body condition score of 4.5 (scale 1-9) (SPIERS, 1999) and no significant clinical signs. The right mammary gland was very enlarged and deformed. Palpation revealed four firm areas, with irregular limits and a diameter of approximately 10cm each. These areas were ulcerated and had a sero-hemorrhagic secretion. The left mammary gland was firm, edematous and painful under palpation, presenting a whitish translucid secretion coming out the teat orifice. Cultures and antibiograms were performed from the mammary secretion to identify a possible pathogen. Results were inconclusive due to extensive secondary infections. Biopsies from the right and left mammary glands were performed and representative slices were sent to the Anatomic Pathology Service of the Department of Epidemiology and Public Health of UFRRJ. Only intense chronic inflammatory reaction and edema were observed. During the stay at the hospital, the animal had poor appetite. After 20 days, the mare was submitted to euthanasia for humanitarian and economical reasons.

Necropsy was performed immediately after euthanasia. There was moderate gelatinous subcutaneous edema extending from the sternum to the inguinal region. The right mammary gland was extremely enlarged, and showed fistulous tracts that opened at the ulcerated skin. The gland was completely invaded by coalescent, beige to yellowish granular masses and whitish conective tissue with colliquation focus. One retro-mammary lymph node was enlarged, firm and had a multi-nodular aspect (Figures 1C and D). There was no macroscopic evidence of invasion to the adjacent abdominal muscles or metastases to other organs of the pelvic, abdominal or thoracic cavities. Fragments of the mammary gland affected and of other organs were collected and fixed in formalin at 10%. After fixation, fragments were routinely processed for embedding in paraffin, sectioned at 3-5μm, and stained with hematoxylin and eosin (HE). Histopathology revealed proliferation of round or polyedric mild anaplastic cells, with round hyperchromatic nuclei, evident nucleoli, and cytoplasm varying from eosinophilic to amphophylic, with moderate anaplasia (Figure 2A). The cells formed solid masses surrounded by fine connective stroma. There were areas of coagulative necrosis (Figure 2B), sometimes with mineralization foci; loss of adhesion of the cells characterized the tubulo-papillary main aspect of the neoplasm. Some tubuli presented ectasia and/or were filled with amorphous eosinophilic material, degenerated epithelial cells and neutrophils. Hemorrhagic foci, macrophages filled with hemosiderin and lipofuscin, and a marked desmoplastic reaction were found especially around the tumoral mass and in the retro-mammary lymph node. Mitotic figures were conspicuous and in many areas the tumor invaded the lymphatic vessels (Figure 2C). There was a metastasis in the retro-mammary lymph node with similar characteristics of the primary tumor (Figure 2D). With the exception of slight to moderate fat degeneration of the liver, no lesions were found in other organs.

Contrary to what occurs in dogs (HEIDRICH & RENK, 1967) and cats (REPPAS et al., 1996; KATO et al., 1998; MACEACHERN et al., 2001; HIRAYAMA et al., 2003), mammary neoplasms are uncommon in herbivores (THEILEN & MADEWELL, 1987; PRENDERGAST et al., 1999; MISDORP, 2002; HIRAYAMA et al., 2003). In equines, rare descriptions of mammary neoplasms are found in animals above 12 years of age (PRENDERGAST et al., 1999). In a study at slaughter houses in France with about 40,000 equines, 45 mammary tumors were observed (0.11%), the majority consisting of carcinomas (PRENDERGAST et al., 1999; MISDORP, 2002). In another study also in European slaughter houses an incidence of 1.99% of equine mammary tumors was found (SCHMAHAL, 1972). The diagnosis of tubulo-papillary adenocarcinoma was based on the typical microscopic lesions. The low incidence of mammary tumors in ruminants and swine has difficult explanation, since cows and mares are bred until the critical years for the development of tumors (WILCOCK, 1993). No metastasis into internal organs was found, although the tumor has grown for at least 2 years. Mineralization foci observed in necrotic areas of this neoplasm are frequently observed in intraductular carcinoma in human beings (KUMAR et al., 2005). Important differential diagnoses for mammary neoplasms include chronic mastitis and peri-natal mammary edema (SEAHORN et al., 1992). In cases where the increase in volume of the mammary gland yields negative aerobic cultures and the initial treatment with large spectrum

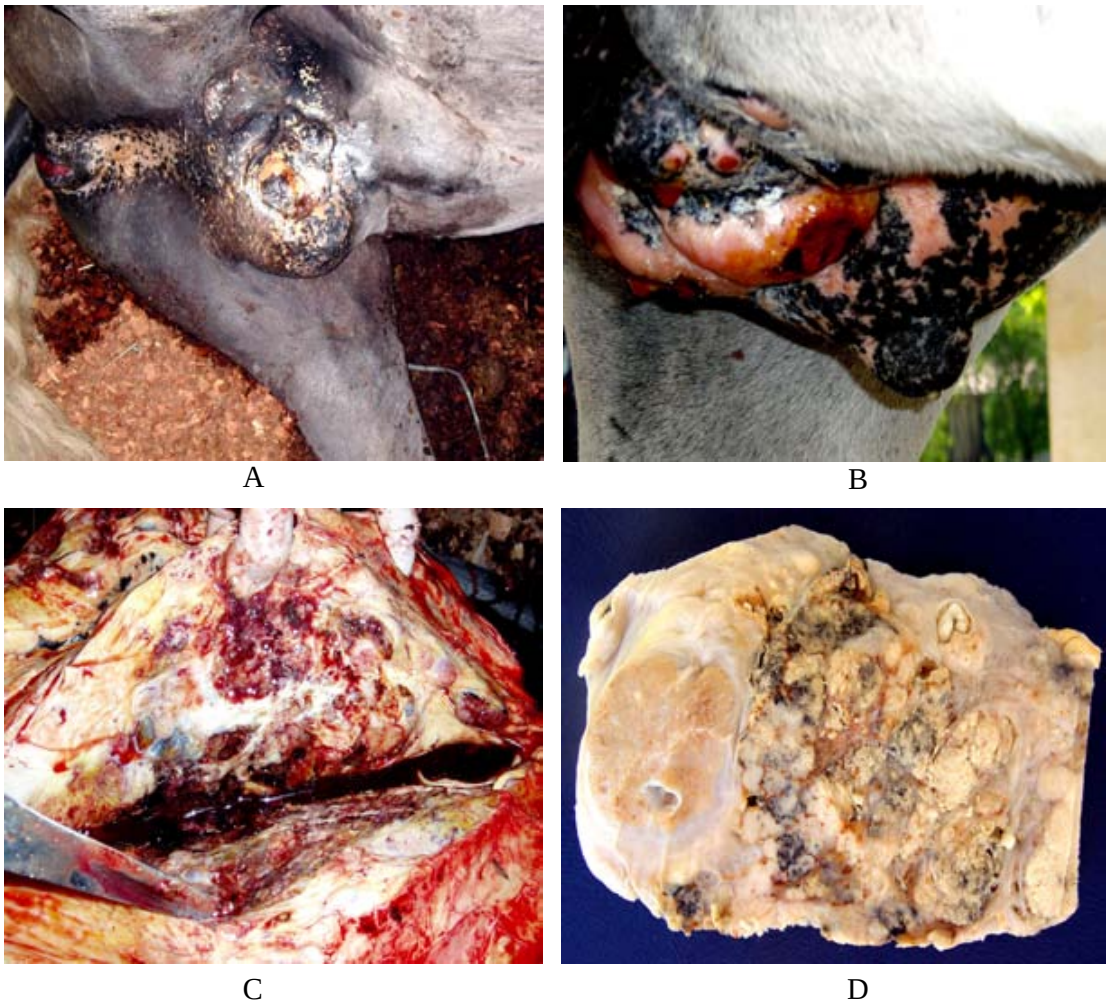

Figure 1 - Mammary adenocarcinoma in a mare. A. Swollen and ulcerated mammary gland. B. A closer view. C. Cut surface of the tumor, showing multinodular aspect, hemorrhagic areas and fibrosis. D. Cut surface of the tumoral mass fixed in formalin. On the left (arrow) an affected lymph node surrounded by fibrous connective tissue; on the right, necrotic areas within the tumoral growth.

antibiotics, anti-inflammatories, and fluid therapy are ineffective, neoplasms or hyperplasia of the mammary gland can be suspected (PERKINS & THRELFALL, 2000). Some clinical characteristics, peculiar to mammary neoplasms, may help the diagnosis. It includes superficial ulceration, observed by PRENDEGAST et al., (1999) and also in this case, as a common clinical sign of carcinomas and adenocarcinomas. No ulceration was observed in 28 cases of acute mastitis (MCCUE & WILSON, 1989). Pain is not a sign that can be used to differentiate between mastitis and mammary neoplasms. In 29 cases of mammary tumors in mares found in the literature (SCHMAHAL, 1972; THEILEN & MADEWELL, 1987; SEAHORN et al., 1992; PRENDERGAST et al., 1999; HIRAYAMA et al., 2003), and 28 cases of acute mastitis (MCCUE & WILSON, 1989). Initially, the process can be confused with mastitis (REPPAS et al., 1996). Pain was found in 8 and 15 animals, respectively. In another study, 17 cases of mastitis were described, and only three cases presented pain at palpation (PERKINS & THRELFALL, 2000). The first microscopic evaluation of the mammary biopsy did not reveal neoplastic cells, probably because the specimens were collected from an area of secondary inflammation. Differential diagnosis between mastitis and mammary neoplasms can be done through cytological evaluation; however this is a complementary procedure that does not replace

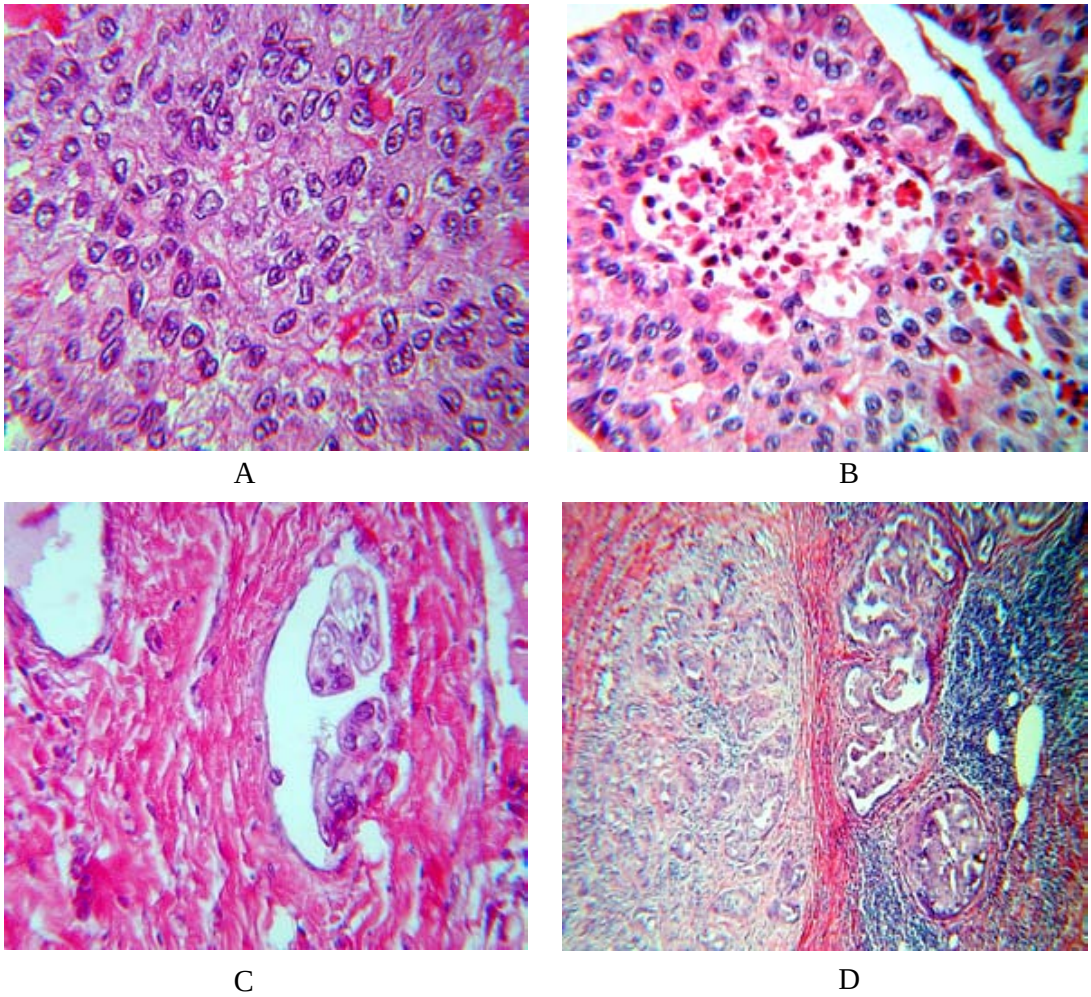

Figure 2 - Mammary adenocarcinoma in a mare. A. Solid area of the neoplasm. H&E, obj. 40x. B. Neoplastic proliferation with central coagulative necrosis. H&E, obj. 25x. C. Neoplastic cells in a lymphatic vessel (arrow). H&E, obj. 25x. D. Metastasis in retromammary lymph node. H&E, obj. 10x.

histopathology as a diagnostic tool (PRENDERGAST et al., 1999). Mastectomy and regional lymphadenectomy may increase the life span of affected animals. Therefore these are elective treatments in cases of early diagnosis. Possible complications include no healing of the wound and peritonitis (SEAHORN et al., 1992). Recurrence with the involvement of the other gland in cases of partial mastectomy may occur (PRENDERGAST et al., 1999).

This work shows the importance of the histopathological examination in the differential diagnosis between the neoplasms and the chronic inflammation in the mammary gland of mares, as well as, to show that the cytological examination cannot detect the tumor, in case the puncture is made in areas of secondary infection.

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