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Sinonasal multilobular tumor of bone in a young mare – case report

[*Tumor ósseo multilobular sinonasal em uma égua jovem – relato de caso*]

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ABSTRACT

A two-year old mare was referred to the veterinary hospital because of an increase in the volume of the head on the frontal and left side as well as dyspnoea. Radiographic examination showed an osseous radiopaque spherical mass, with a granular aspect, affecting the left frontal, maxillary, and nasal bones. A frontal sinusotomy was performed, and the frontal sinus was found to be totally obliterated by a granular, yellowish, and hard mass containing multiple spicules. Histologically, it was a multilobulated osseous neoplasia diagnosed as a multilobular osseous tumour. Because of poor prognosis, the animal was euthanized. Necropsy showed that the left nasal cavity was totally effaced as were the nasal sinuses and that the nasal turbinate disappeared because of the hard, yellowish, and granular mass measuring 20 × 14 × 14 cm that surrounded the molar teeth and extended to the cribriform plate. This tumour, which was described only once in horses, is more frequently observed in older dogs' skulls, and must be considered as a differential diagnosis in horses with sinonasal diseases.

Keywords**:** horse, bone neoplasm, nasal obstruction, facial distortion

RESUMO

Uma égua de dois anos de idade foi encaminhada ao Hospital Veterinário devido a um aumento de volume nas regiões frontal e lateral esquerdas da cabeça, associado à dispneia. Exame radiográfico demonstrou a existência de uma massa esférica radiopaca de aspecto granular afetando os ossos frontal, maxilar e nasal esquerdos. Sinusotomia frontal foi realizada e o seio frontal era totalmente obliterado por uma massa amarelada, granular e dura, com múltiplas espículas. Histologicamente, era uma neoplasia óssea multilobulada, diagnosticada como tumor ósseo multilobular. Devido ao prognóstico ruim, a égua foi eutanasiada. Durante a necropsia, observou-se desaparecimento dos turbinados nasais assim como obliteração total da cavidade nasal esquerda e dos seios nasais por uma massa dura, amarelada e granular, de 20x14x14cm, que circundava os dentes molares e estendia-se à placa cribriforme. Esse tumor, que foi descrito apenas uma vez em equinos, é mais frequente no crânio de cães idosos e deve ser considerado como diagnóstico diferencial em equinos com doenças sinonasais.

Palavras-chave: equino, neoplasma ósseo, obstrução nasal, distorção facial

INTRODUCTION

Sinonasal diseases in horses are uncommon, and previous studies showed that the prevalence of neoplasia was between 7.9% and 23.5% (Boulton, 1985; Tremaine and Dixon, 2001). The most frequently observed tumors are osteomas, adenomas/adenocarcinomas, squamous cell carcinomas, and osteosarcomas (Dixon and Head, 1999; Davis *et al*., 2002; Schaaf *et al*., 2007).

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Multilobular osseous tumors are uncommon in veterinary medicine, and they have been described to affect the skull bones of dogs. These are locally aggressive and potentially malignant (Dernell *et al*., 1998) and one such case of a horse was described before (Richardson and Acland, 1983).

The aim of this study is to describe the clinical and anatomopathological aspects of a multilobular osseous tumor affecting the nasal cavity and paranasal sinuses of a young mare.

CASUISTRY

A two-year-old mare, American Quarter Horse, was referred to the veterinary hospital of the Federal University of Mato Grosso do Sul because of a marked enlargement of the frontal and left sides of the head associated with dyspnoea, with a four-month progression.

During physical evaluation, the animal was alert; it was in good body condition and showed a marked facial asymmetry secondary to a volume increase affecting the nasal, frontal, and maxillary left bones (Fig. 1). Furthermore, the patient showed inspiratory dyspnoea, mucopurulent nasal discharge, and no air flux in the left nostril; exophthalmia and epiphora in the left eye; hyperaemic ocular mucous membranes; tachycardia (58 beats/minute); and tachypnoea (24 movements/minute). The remaining parameters were normal, and no teeth abnormalities were found. Additionally, it was observed that when the horse was eating, there were cough episodes.

Figure 1. Multilobular osseous tumor in the left nasal cavity and paranasal sinuses of a mare. It is hard and markedly enlarged, affecting the left nasal, frontal, and maxillary bones.

Ancillary tests, namely, hemogram, skull x-ray (latero-lateral and dorsoventral projections), and rhinoscopy, were performed. There were no abnormalities in the hemogram. Radiographs showed a spherical mass with osseous radiopacity and granular aspect affecting the frontal, maxillary, and nasal left bones; distortion in the osseous trabecula; osteolysis; and osseous proliferation (Fig. 2). Rhinoscopy showed, in the left nostril, a large intraluminal mass projecting to the nasal lumen, covered by normal nasal mucosal, occupying almost the entire meatus. In

the right nostril, meatus passage was blocked because of the displacement of the nasal septum. During this procedure, a sample was collected from the mass and fixed in 10% formalin for histological evaluation. Histologically, the sample consisted only of superficial layers of the nasal mucosa, which was unaffected.

Figure 2. Multilobular osseous tumor in the left nasal cavity and paranasal sinuses of a mare. Radiographic image showing dorsoventral projection. A spherical, osseous, radiopaque mass affecting the left frontal, maxillary, and nasal bones and showing osteolysis and osseous proliferation can be observed.

Considering the inconclusive result of the first biopsy, a left frontal sinusotomy was performed. The animal was maintained in the standing position; the anesthetic protocol involved the administration of a $0.01mg/kg^{-1}$ $hour^{-1}$ detomidine bolus (Dormium V®, cloridrato de detomidina, Agener União, Brasil) followed by continuous infusion of $0.015mg/kg^{-1}$ h^{-1} and local blockage of the supraorbital nerve and the incision line with lidocaine 2% (Xylestesin®, cloridrato de lidocaína, Cristália, Brasil). A flap was made in the frontal bone; the frontal sinus was totally effaced by a hard yellowish and granular mass with small spicules. From this portion, a new sample was collected for histopathology.

Microscopic examination revealed that the samples showed neoplastic proliferation, which was non-encapsulated and infiltrative and showed a multilobular pattern, with lobules separated by moderate fibrous tissue. The lobules had a predominantly mineralized core, but sometimes had a cartilaginous matrix, surrounded by a layer of round and large cells and osteoid matrix that merged with mesenchymal elongated cells (fibrous connective tissue). The tumor was classified as a multilobular osseous tumor (Fig. 3).

Considering the impossibility of surgical removal and the respiratory disturbances, the mare was euthanized and necropsied. Necropsy showed that there was a marked facial asymmetry because of a hard enlargement measuring 18 cm, in the left frontal region. Sequential incisions were made in the nasal, frontal, and maxillary bones to visualize the

cavity. The left nasal cavity and the paranasal sinuses were totally effaced, and the nasal turbinate were not visible; there was a yellowish and granular hard mass of 20 × 14 × 14 cm that surrounded the molar teeth and extended to the cribriform plate (Fig. 4-5). In addition, the mass displaced the nasal septum to the right nasal cavity, decreasing the luminal diameter. No other abnormalities were found. Histologically, the findings were identical to those of the biopsy sample.

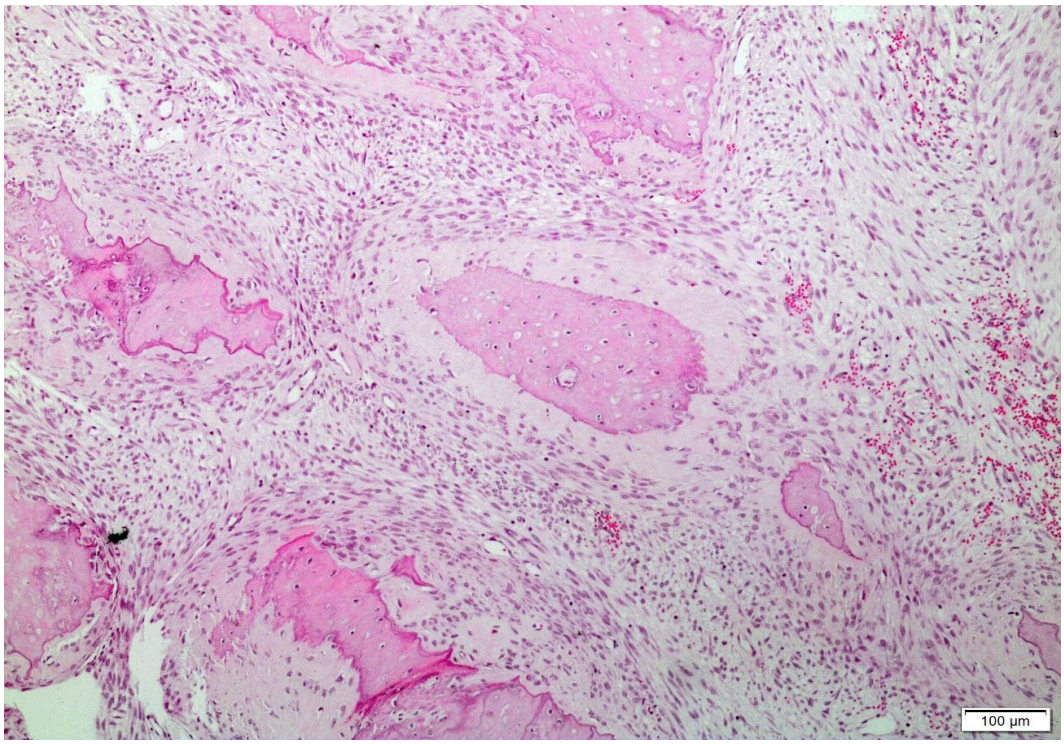

Figure 3. Multilobular osseous tumor in the left nasal cavity and paranasal sinuses of a mare. Trilaminar histological pattern of the tumor. It is a multilobular, non-encapsulated, and infiltrative neoplasm. The lobules have a predominantly mineralized core and are surrounded by a thick layer of fibrous connective tissue.

Figure 4-5. Multilobular osseous tumor in the left nasal cavity and paranasal sinuses of a mare. The left nasal cavity is effaced by a spherical, yellowish mass, with a granular aspect that displaces the nasal septum into the right nasal cavity. The mass surrounds the molar teeth, and the nasal turbinate are missing.

DISCUSSION

The diagnosis was based on the histological findings of the tumor, which showed a characteristic trilaminar pattern (Dernell *et al*., 1998). The abundant fibrous, stromal, and multilobular pattern allowed the definitive diagnosis (Richardson and Acland, 1983). Despite the benign morphology of the cells and slow growth, this tumor showed the characteristics of malignancy such as local invasiveness and compression of adjacent tissues; furthermore, metastases have already been described (McCalla *et al*., 1989; Thompson and Dittmer, 2017).

The mare in the present case was young (two-year-old), unlike the 12-year-old mare (Richardson and Acland, 1983) and middle-aged and old dogs described in previous studies (McCalla *et al*., 1989; Banks and Straw, 2004). However, if only fibro-osseous and osseous tumors of the nasal cavity and paranasal sinuses in horses are considered, the mean age of affected horses is 4 years (Dixon and Head, 1999).

This type of tumor is more frequently described in the skull bones (calvarium) and maxillary and jaw bones of large breed dogs (Dernell *et al*., 1998), but it has already been observed in the orbit (McCalla *et al*., 1989), hard palate (Banks and Straw, 2004), zygomatic bone (Dernell *et al*., 1998) of dogs, and in the retrobulbar region of horses (Richardson and Acland, 1983).

As in the case of this horse, animals are usually affected by just one mass (Thompson and Dittmer, 2017). Nasal and paranasal tumors may develop because of infiltration and/or expansion and the clinical signs in this case (facial asymmetry, exophthalmia, epiphora, mucopurulent nasal discharge, dyspnea, and airflow obstruction) are consequences of a space occupying lesion (Baker, 1999) and are the most common signs of neoplasia of the nasal cavity and paranasal sinuses. Other signs that can be observed are chewing disorder, pain when the mouth is open, epistaxis, and halitosis. In patients with brain compression, neurological disorders can occur (Boulton, 1985; Baker, 1999; Banks and Straw, 2004; Thompson and Dittmer, 2017).

Although these diseases are relatively uncommon, diagnosis and treatment of sinonasal diseases in horses are complicated by the complex anatomy, difficulties in evaluating the structures, chances of bleeding, and advanced stage of the disease at the time of diagnosis (Boulton, 1985; Freeman, 2003). Therefore, even in cases of benign neoplasia, the prognosis is usually poor (Boulton, 1985), and relapses and death or euthanasia are common (Boulton, 1985; McCalla *et al*., 1989; Dernell *et al*., 1998; Dixon and Head, 1999), as observed in the current horse.

In the current case, it was not possible to detect the origin of the tumor growth. This is a common problem associated with neoplasia affecting the nasal cavity and paranasal sinuses in horses, even with the aid of ancillary tests such as x-ray radiography and endoscopy (Dixon and Head, 1999; Schaaf *et al*., 2007). Considering that multilobular osseous tumors show slow growth rate, this incapability to determine the exact site of origin could be associated with the occurrence of tissue destruction due to the large tumor size, by the time of diagnosis (Dernell *et al*., 1998; Freeman, 2003; Thompson and Dittmer, 2017).

CONCLUSIONS

Neoplasia in the nasal cavity and paranasal sinuses of horses are relatively uncommon but should be included as differential diagnoses when nasal discharge, epiphoras, and facial distortions are noted because delayed detection of this type of lesions is usually associated with a poor prognosis. The multilobular osseous tumor, despite its benign morphology, can represent a poor prognosis for the animal because the low growth rate increases the possibility of a delayed diagnosis, which is associated with the detection of a large mass that cannot be resected surgically.

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