Journal of Equine Veterinary Science 33 (2013) 751-755

Journal of Equine Veterinary Science

journal homepage: www.j-evs.com

Case Report

A Case of Bronchioloalveolar Carcinoma in a Mare

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ARTICLE INFO

Article history:
Received 3 September 2012
Received in revised form
3 November 2012
Accepted 20 November 2012
Available online 15 March 2013

Keywords:
Equine
Neoplasia
Lung
Bronchioloalveolar carcinoma

ABSTRACT

A case of pulmonary carcinoma in a 23-year-old Quarterhorse mare is described. On physical examination, depression, poor body condition, tachypnea, bilateral serosanguineous nasal discharge and a wide area of reduced breath sounds in association with the right hemithorax were detected. Laboratory evaluation showed leukocytosis with neutrophilia and lymphopenia, hyperfibrinogenemia, hyperprotidemia, hypoalbuminemia, increased beta 2 and gamma globulin fractions, hypoxemia, and normocapnia. Radiography and thoracic ultrasonography revealed a large rounded mass extending from the 9th to the 14th right intercostal space, where neither bronchial nor vascular structures were detectable. Endoscopy showed a large amount of serosanguineous fluid within the tracheal lumen and a mass of reddish soft tissue completely obliterating the right caudal lobar bronchus. Histopathology of the endobronchial mass and of the transthoracic ultrasound-guided biopsy samples was consistent with a primary pulmonary epithelial tumor. Due to worsening of the clinical condition, the mare was euthanized. Postmortem examination confirmed the presence of a large 30-cm mass located in the right caudal pulmonary lobe, characterized by epithelial cells arranged in papillary projections and alveolar structures, findings consistent with bronchioloalveolar carcinoma.

1. Introduction

Primary lung tumors in domestic animals are uncommon; they are more often reported in dogs, cats, and cows and are extremely rare in horses [1]. A relatively small number of tumors have been reported in the equine literature [2] (i.e., in a survey of 1308 slaughtered horses, only 2 horses had a pulmonary tumor: 1 bronchiolar adenoma, 1 granular cell tumor) [3], and in another review, among 38 horses affected by thoracic neoplasia, two cases of pulmonary carcinoma and one case of pleural mesothelioma were identified [4]. Granular cell tumor is the most common primary pulmonary tumor [5]. Other primary pulmonary tumors in horses include carcinoma, adenocarcinoma, bronchial myxoma, leiomyosarcoma, blastoma, pleural mesothelioma and chondrosarcoma [4-6]; these rare cases are often reported as single case reports.

Horses with thoracic and pulmonary tumors present with nonspecific clinical signs, and diagnosis can be difficult [5]. Diagnostic imaging may be helpful in detecting thoracic disorders. Radiography helps in identifying thoracic masses; endoscopy is successfully used both for airway direct visualization and for tissue or fluid sample collection [7]; ultrasonography is an invaluable tool for thoracic scanning and for collecting ultrasound-guided biopsy specimens for histological examination, which is essential to achieve a definitive diagnosis of pulmonary neoplasia [5].

This report describes clinical presentation, diagnostic protocol and post-mortem findings in a case of primary pulmonary neoplasia in a mare.

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http://dx.doi.org/10.1016/j.jevs.2012.11.013

2. Case Presentation

2.1. History

A 23-year-old Quarterhorse mare presented with a history of progressive weight loss and chronic cough. One week prior to presentation, the mare was observed to have a bilateral serosanguineous nasal discharge. Previous to referral, the mare was treated with antibiotics (penicillin and streptomycin) by the referring veterinarian without evidence of clinical improvement.

2.2. Physical Examination

On presentation, the mare weighed 471 kg, with a body score of 2 of 5, and was depressed and anorectic; pulse rate was 39 beats/min, respiratory rate was 24 breaths/min, and rectal temperature was 37.6°C. Mucous membranes and regional lymph nodes were normal. There was spontaneous coughing, a bilateral serosanguineous nasal discharge, and increased expiratory effort. On pulmonary auscultation, reduced breath sounds were evident in association with the right hemithorax, localized from the 9th -14th intercostal space.

2.3. Laboratory Evaluation

A venous blood sample was collected from the left jugular vein into vials containing sodium citrate for plasma fibrinogen concentration (Iris photometer1; Sclavo Diagnostics International, Italy) and blood clotting (prothrombin time and activated partial thromboplastin time; Clot 2S: Seac srl, Italy), EDTA for complete blood count (Advia 120; Bayer, Germany), and empty vials for serum biochemistry (Cobas Mira Classic; Roche, Switzerland) and electrophoresis (Hydrasys, Sebia, Italy). Laboratory evaluation showed leukocytosis, 19.5 $\times$ 10^9/L (reference range [rr], 5.5 $\times$ 10^9/L-9.0 $\times$ 10^9/L) with neutrophilia 81% (rr, 30%-65%); and lymphopenia 14% (rr, 25%-40%); hyperfibrinogenemia 3.85 g/dL (rr, 1.0-2.5 g/dL); increased platelet count, 341 $\times$$10^9$/L (rr, 90$\times$$10^9$/L-200 $\times$$10^9$/L); hyperprotidemia, 10.6 g/dL (rr, 6-8 g/dL), with hypoalbuminemia, 1.2 g/dL (rr, 3.2-4.1 g/dL); increased beta 2, 1.8 g/dL (rr, 0.1-0.2 g/dL); and gamma globulin fractions, 5.5 g/dL (rr, 0.7-1.7 g/dL).

For blood gas analysis, 1.5 ml of arterial blood was anaerobically collected from the right carotid artery with a heparinized syringe and immediately processed with an Osmetch Opti CCA analyzer (Opti Medical), which showed the presence of hypoxemia, 76 mm Hg (rr, 85-112 mm Hg), and normocapnia, 37 mm Hg (rr, 36-45 mm Hg).

2.4. Diagnostic Imaging

Latero-lateral radiographs from left to right side of the dorsocaudal field of the thorax revealed the presence of an ovoid, solitary mass measuring 30 cm in height and 40 cm in length. No significant changes were observed by alternating the side (Fig. 1).

Thoracic ultrasonography performed with a 5.0-MHz convex probe (Technos MPX; Esaote Biomedica, Italy) showed a large mass extending from the 9th-14th right intercostal space in a craniocaudal direction and from the epaxial muscles to a line passing from the point of the shoulder in a dorsoventral direction. In the context of the mass, large areas homogeneously echogenic, rounded areas both hypo- and anechoic or hyperechoic areas were visible. Normal pulmonary parenchymal architecture was not visible. In contrast, a mass lesion was apparent, although specific bronchial or vascular structures could be definitively identified (Fig. 2). The cranial mediastinal space and the abdominal cavity were also examined in order to rule out possible metastatic lesions, and no abnormalities were observed.

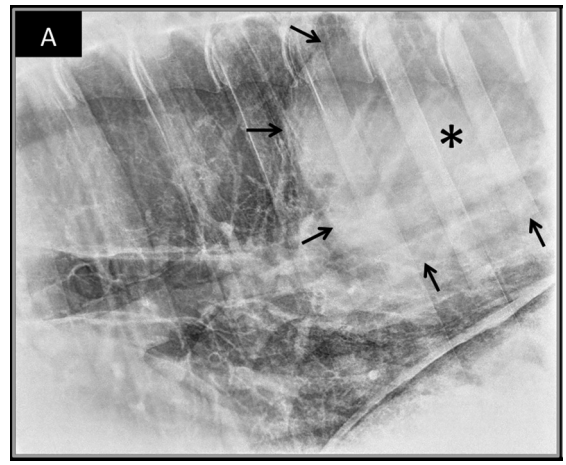

Fig. 1. Left to right latero-lateral radiographs of the caudodorsal field of the thorax. There is a large mass occupying the entire caudal field of the thorax. The cranial margin (arrows) of the mass (asterisks) is better evaluated in a region between the craniodorsal and caudodorsal fields.

2.5. Endoscopy

Upper airway endoscopy was performed with a 180-cm videobronchoscope (FVE 180-10; Dr. Fritz Gmbh, Germany), previously cleaned and disinfected with a glutaraldehyde solution (ETD3 automatic washer; Olympus Italia, Italy). Upper airway endoscopy included examination of the

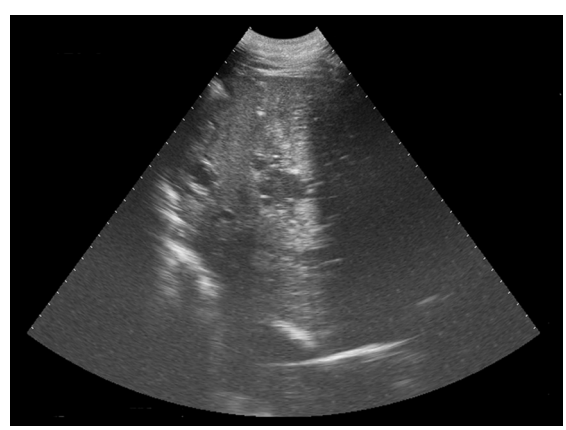

Fig. 2. Thoracic ultrasonography of the right 10th intercostal space. The mass is characterized by the presence of areas homogeneously echogenic, rounded areas both hypo- and anechoic or hyperechoic areas. Normal lung parenchymal architecture is not identifiable. The dorsum is on the right side and ventrum is on the left side of the image. Maximum depth is 26 cm.