A CASE OF COLIC DUE TO METASTATIC MELANOMA IN A 23-YEAR-OLD MARE

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ABSTRACT

A 23-year-old grey Argentinian mare was presented with a history of chronic weight loss, anorexia, restlessness, pawing, rolling, frequent recumbency, straining to urinate, urinating frank blood and round and firm subcutaneous lumps on left neck and occiput. Clinical examination showed tachypnea, congested mucous membrane and capillary refill time greater than 2 seconds, bruises on different parts of the body, bilateral epiphora, sunken eyelids, and slight loss of skin turgor, body condition score of 3/5, depression and temperature of 38.9°C. Abdominocentesis revealed frank blood while rectal palpation showed a large mass on the left quadrant. Haematology revealed increased packed cell volume (44 %), lymphopenia and neutrophilia. Serum biochemistry revealed hypercalcaemia, increased alanine aminotransferase, uremia, hyperproteinemia and hyperfibrinogenaemia. The horse was treated for colic and died 24 hours after the presentation. At post-mortem examination, the liver and spleen were remarkably enlarged and nodular with numerous surface melanomas. A large black firm nodular mass of about 7 kg was observed on the left kidney. Diagnosis of malignant melanoma was made. In conclusion, this case demonstrates the malignant behaviour of equine melanomas hence early detection and prompt treatment of small lumps before they proliferate is recommended.

Keywords: Abdominocentesis, Colic, Equine, Melanoma, Post-mortem

INTRODUCTION

Melanomas are pigmented tumours commonly found in grey horses (Moore *et al.,* 2013). A study showed that, in grey horses, a disturbance in melanin metabolism and transfer associated with progressive greying of the hair as a result of increasing age leads to intra-cellular accumulation of pigment (Sutton and Coleman, 1997). It has also been revealed that 80 % of grey horses will have at least a melanoma during their lives (Tannler, 2013). Melanoma can occur in the eyelids, iris, retina, lips, parotid salivary glands and lymph nodes. Melanoma can be benign or malignant (Patterson-Kane *et al.,* 2001). Metastasis occur secondary to haematogenous and lymphatic spread (White *et al*., 2000). In horses, metastases may arise because of multiple sites of melanocyte proliferation and can spread to the internal organs including the intestine, heart, kidney and lungs (Mosbah and Awadin, 2016) resulting in a very poor prognosis for the affected horse. Involvement of the kidney may

cause blood in the urine, while in the spleen may lead to bleeding into the abdomen with abnormal melanin-producing cells present in the fluid (MacGillivray *et al.,* 2002). Malignant abdominal melanoma may result in colic. Colic is used to describe abdominal pain in the horse (Abutarbush *et al*., 2005). Malignant tumours often associated with equine colic include intestinal or splenic lymphoma, adenocarcinoma and other sarcomas (Taylor *et al*., 2006). Other reported malignancies causing colic are metastatic tumours such as melanoma and squamous cell carcinoma (Pauwels *et al*., 2012). Signs of colic include depression, in-appetence, sweating, pawing, kicking or biting at the belly, repeated lying down and stretching out to urinate (Curtis *et al*., 2019). Diagnosis of colic includes passing a nasogastric tube to check for reflux, rectal examination, abdominocentesis and ultrasound examination of the abdomen (Bowden *et al*., 2020). Neoplasia should be considered when common causes of colic are ruled out, or if a mass is detected on physical or ultrasonic examination (Pauwels *et al*., 2012). A definitive diagnosis of tumour-causing colic is made at celiotomy or post-mortem examination (Metcalfe *et al*., 2013). Treatment of colic involves the use of analgesia, sedative, and laxatives administered directly into the stomach via nasogastric tube and rehydration with oral or inter-venous fluids (Mayaki *et al*., 2018; Curtis *et al*., 2019). Surgical intervention may be considered if the horse remains uncomfortable after medical treatment (Taylor *et al*., 2006; Groom and Sullins, 2017). This paper reports a case of colic due to metastatic melanoma in a 23-year-old mare.

CASE PRESENTATION

Case History and Examination: A 23-year-old grey Argentine mare, weighing 360 Kg in a stable of 50 horses located at Fifth Chukker, Polo Club, Kaduna was presented with complaints of anorexia, restlessness, pawing, rolling, frequent recumbency and urinating frank blood. The horse had a history of insidious weight loss over a year and had round and firm subcutaneous lumps on the left neck and occiput (Figures 1 and 2).

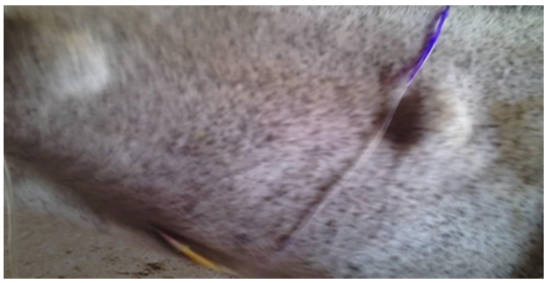

Figure 1: Lump on the left neck of the 23-year-old mare

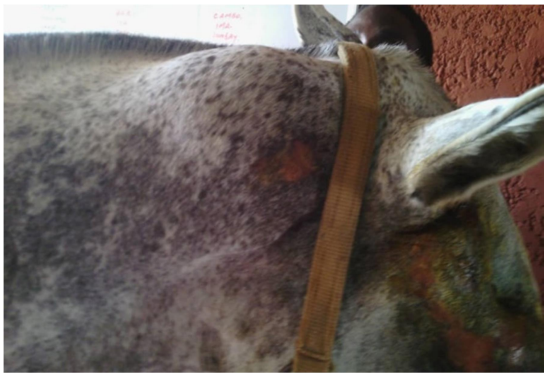

Figure 2: Subcutaneous lump on the occiput of the 23-year-old horse

On examination, the animal was found to have a body condition score of 3/5, 8 % dehydrated, there was tachypnea (32 b/min), congested mucous membrane, bilateral epiphora, sunken eyelids, and capillary refill time greater than 2 seconds, bruises on different parts of the body, there was a slight loss of skin turgor and temperature of 38.9^{o}C.

Diagnostic Procedure: Clinically, an abdominal mass on the left quadrant was detected on rectal examination. Abdominocentesis showed frank blood. Haematological and biochemical assay were done using blood samples collected from jugular vein (Coles, 1986).

RESULTS

Haematology showed (PCV 44 %; reference range [rr] 28 – 42 %), Lymphopenia (0.92 x 10^{9}/l; rr 1.70 – 6.10 x 10^{9}/l), neutrophilia (20.3 x 10^{9}; rr 3.08 – 7.34 x 10^{9}/L). Serum biochemistry revealed hypercalcaemia (21.5 mm/L; rr 2.6 – 3.3 mm/L), increase alanine aminotransferase (ALT) (25 U/L; rr 2.7 – 21 U/L), uremia (11.54 mm/L; rr 3.7 – 8.8

mm/L), hyperproteinaemia (9.2 g/dL, rr 4.6 – 6.9 g/dL), hyperfibrinogenaemia (5.82 g/L, rr 1–4 g/L).

Management: The horse was treated for colic based on history and clinical signs. It was administered with 4 litres of 5 % dextrose saline at 2.5 ml/kg/hour/IV. Buscopan 0.3 mg/kg IV, flunixin meglumine 1.1 mg/kg IV q 24 hours and Procaine penicillin G 22.000 IU/kg IM. The animal died 24 hours after presentation.

Post-Mortem Lesion: The carcass was dehydrated and the abdomen distended. There was generalized icterus on the muscles and viscera. The abdominal fluid observed was dark red in colour. The liver and spleen were remarkably enlarged and nodular, with numerous surface melanomas. A large black firm nodular mass of about 7 kg was observed on the cortex of the left kidney.

DISCUSSION

In equine practice, melanomas are often presented in advanced stages, when tumour expansion has already compromised the affected tissue or structure (Phillips and Lembcke, 2013). A study has shown that dermal melanoma has a proclivity for local invasion and metastasis (Moore *et al.,* 2013). It has been postulated that metastatic melanoma should be considered a differential diagnosis of any grey horse that presents for veterinary evaluation (MacGillivray *et al.,* 2002). In the present case, the diagnosis of colic due to systemic metastasis of skin melanoma was made based on history, clinical signs and post-mortem lesions. Intra-abdominal neoplasia usually present with colic, inappetence, lethargy, chronic weight loss, intermittent fever and haemoabdomen (Santschi, 2012; Phillips, 2016). An increase in total protein seen in this case is commonly seen both with dehydration and chronic disease (Muñoz *et al.,* 2010). Chronic inflammatory diseases seen in infection or cancer will cause a gradual increase in globulin concentration, resulting in an increase in total protein (Meyer *et al*., 2006). Raised levels of PCV and total protein represent intravascular dehydration (Edwards, 2013) and an increase in PCV is usually a relative increase as it does not involve an increase in red cell mass of the body but due to dehydration or splenic contraction (Wilson, 2011).

The multiple nodules seen on the liver were due to malignant melanomas in the liver from other primary locations (Beeler-Marfisi *et al.,* 2010). The haematuria was due to damage to the kidney and the bleeding in the abdomen was because of the involvement of the spleen and liver due to the melanoma (Pulley and Stannard, 1990). Haemoperitoneum has been reported secondary to splenic or hepatic injury (Southwood *et al.,* 2000; Dechant *et al.,* 2006). Melanoma is the most common metastatic lesion affecting the spleen of horses (Phillips, 2016). Splenic haemorrhage and rupture include splenomegaly due to neoplasia, abscessation, infarction, amyloidosis, and several infectious diseases that result in cellular infiltration of the spleen (Lampert, 1994). An increase in urea and total protein indicates increase damage to the kidney (Trigo *et al.,* 2010). Hypercalcaemia observed in this case, may be due to the impairment of the kidney by the melanoma since horses use renal calcium excretion as a means of maintaining calcium haemeostasis (Kohn and Chew, 1987). The increase in ALT in the serum of this horse was due to hepatocellular injury (Divers and Barton, 2018). Hyperfibrinogenaemia is a response to inflammation. Hyperfibrinogenaemia of chronic disease are seen in cases of intra-abdominal neoplasia (Muñoz *et al.,* 2009). The neutrophilia observed usually occurs in pathological situations such as inflammation, infection, and neoplasia (Rossdale *et al.,* 1982). The horse died because of the aggressive nature of the melanoma which had compromised the functions of various internal organs of the animal.

Conclusion: Veterinarians should recognize that dermal melanomas can indeed have life-threatening consequences hence early detection and prompt treatment of small lumps before they multiply is important.

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REFERENCES

ABUTARBUSH, S. M., CARMALT, J. L. and SHOEMAKER, R. W. (2005). Causes of gastrointestinal colic in horses in western Canada: 604 cases (1992 to 2002). *The Canadian Veterinary Journal*, 46(9): 800 – 805.

BEELER-MARFISI, J., ARROYO, L., CASWELL, J. L., DELAY, J. and BIENZLE, D. (2010). Equine primary liver tumors: a case series and review of the literature. *Journal of Veterinary Diagnostic Investigation,* 22(2): 174 – 183.

BOWDEN, A., BURFORD, J. H., BRENNAN, M. L., ENGLAND, G. C. W. and FREEMAN, S. L. (2020). Horse owners' knowledge, and opinions on recognising colic in the horse. *Equine Veterinary Journal*, 52(2): 262 – 267.

COLES, E. H. (1986). *Veterinary Clinical Pathology.* 4th Edition, W. B. Saunders, Philadelphia, USA.

CURTIS, L., BURFORD, J. H., ENGLAND, G. C. and FREEMAN, S. L. (2019). Risk factors for acute abdominal pain (colic) in the adult horse: a scoping review of risk factors, and a systematic review of the effect of management-related changes. *PLoS One*, 14(7): e0219307. https://doi.org/10.1371/journal.pone.0219307

DECHANT, J. E., NIETO, J. E. and LEJEUNE, S. S. (2006). Hemoperitoneum in horses: 67 cases (1989-2004). *Journal of American Veterinary Medical Association,* 229(2): 253 – 258.

DIVERS, T. J. and BARTON, M. H. (2018). Disorders of the liver. Pages 843 – 881. *In:* REED, S. M., BAYLY, W. M. and SELLON, D. C. (Eds.). *Equine Internal Medicine.* 4th Edition, W. B. Saunders, Philadelphia, USA.

EDWARDS, G. B. (2013). Gastroenterology 1: Colic. Pages 21 – 47. *In:* MAIR, T., LOVE, S., SCHUMACHER, J., SMITH, R. and FRAZER, G. (Eds.). *Equine Medicine, Surgery and Reproduction*. 2nd Edition, Saunders Elsevier, USA.

GROOM, L. M. and SULLINS, K. E. (2017). Surgical excision of large melanocytic tumours in grey horses: 38 cases (2001 – 2013). *Equine Veterinary Education*, 30(8): 438 – 443.

KOHN, C. V. and CHEW, D. J. (1987). Laboratory diagnosis and characterization of renal disease in horses. *Veterinary Clinics of North America: Equine Practice,* 3(3): 585 – 615.

LAMPERT, I. A. (1994). Pathology of the spleen. Pages 58 – 59. *In:* CUSCHIERI, A. and FORBES, D. C. (Eds.). *Disorders of the Spleen*. Blackwell Scientific Publications, London.

MACGILLIVRAY, K. C., SWEENEY, R. W. and PIERO, F. D. (2002). Metastatic melanoma in horses. *Journal of Veterinary Internal Medicine*, 16(4): 452 – 456.

MAYAKI, A. M., MERA, U. M. and TALABI, A. O. (2018). Prevalence and associated risk factors of equine colic in Sokoto metropolis, Nigeria. *Vom Journal of Veterinary Science,* 13(1): 44 – 51.

METCALFE, L. V., O'BRIEN, P. J., PAPAKONSTANTINOU, S., CAHALAN, S. D., MCALLISTER, H. and DUGGAN, V. E. (2013). Malignant melanoma in a grey horse: case presentation and review of equine melanoma treatment options. *Irish Veterinary Journal*, 66: 22. https://doi.org/10.1186 /2046-0481-66-22

MEYER, J., DELAY, J. and BIENZLE, D. (2006). Clinical, laboratory, and histopathologic features of equine lymphoma. *Veterinary Pathology,* 43(6): 914 – 924.

MOORE, J. S., SHAW, E., BUECHNER-MAXWELL, V., SCARRATT, W. K., CRISMAN, M., FURR, M. and ROBERTSON, J. (2013). Melanoma in horses: current perspectives. *Equine Veterinary Education*, 25(3): 144 – 151.

MOSBAH, E. and AWADIN, W. (2016). Diagnosis and management of a malignant dermal melanoma in a donkey (*Equus asinus*).

Iranian Journal of Veterinary Surgery, 11(1): 45 – 49.

MUÑOZ, A., RIBER, C., TRIGO, P. and CASTEJÓN, F. (2009). Hematopoietic neoplasias in horses: myeloproliferative and lymphoproliferative disorders. *Journal of Equine Science*, 20(4): 59 – 72.

MUÑOZ, A., RIBER, C., TRIGO, P. and CASTEJÓN, F. (2010). Hematology and clinical pathology data in chronically starved horses. *Journal of Equine Veterinary Science*, 30(10): 581 – 589.

PATTERSON-KANE, J. C., SANCHEZ, L. C., UHL, E. W. and EDENS, L. M. (2001). Disseminated metastatic intramedullary melanoma in an aged grey horse. *Journal of Comparative Pathology*, 125(2-4): 204 – 207.

PAUWELS, F. E. T., WIGLEY, S. J., MUNDAY, J. S. and ROE, W. D. (2012). Bilateral ovarian adenocarcinoma in a mare causing haemoperitoneum and colic. *New Zealand Veterinary Journal*, 60(3): 198 – 202.

PHILLIPS, J. (2016). *Splenic and Other Soft Tissue Tumors*. Chapter 100. https://veteriankey.com/category/equine-medicine. Accessed July 25, 2022.

PHILLIPS, J. C. and LEMBCKE, L. M. (2013). Equine melanocytic tumors. *Veterinary Clinics: Equine Practice*, 29(3): 673 – 687.

PULLEY, L. T. and STANNARD, A. A. (1990). Melanocytic tumor. Pages 75 – 87. *In:* MOULTON, J. E. (Ed.). *Tumors in Domestic Animals*. 3rd Edition, University of California Press, Los Angeles, USA.

ROSSDALE, P. D., BURGUEZ, P. N. and CASH, G. (1982). Changes in blood neutrophil/ lymphocyte ration related to adrenocortical function in the horse. *Equine Veterinary Journal*, 14(4): 293 – 298.

SANTSCHI, E. M. (2012). Equine colic caused by neoplasia. *Equine Veterinary Education*, 24(9): 437 – 438.

SOUTHWOOD, L. L., SCHOTT, H. C., HENRY, C. J., KENNEDY, F. A., HINES, M. T., GEOR, R. J. and HASSEL, D. M. (2000). Disseminated hemangiosarcoma in the horse: 35 cases. *Journal of Veterinary Internal Medicine*, 14(1): 105 – 109.

SUTTON, R. H. and COLEMAN, G. T. (1997). Melanoma and the greying horse. *RIRDC (Rural Industries Research and Development Corporation) Research Paper Series*, 55: 1 – 27.

TANNLER, B. (2013). Equine melanoma. *Equine Health Update,* 15(1): 1 – 2.

TAYLOR, S. D., PUSTERLA, N., VAUGHAN, B., WHITCOMB, M. B. and WILSON, W. D. (2006). Intestinal neoplasia in horses. *Journal of Veterinary Internal Medicine*, 20(6): 1429 – 1436.

TRIGO, P., CASTEJÓN, F., RIBER, C. and MUÑOZ, A. (2010). Use of biochemical parameters to predict metabolic elimination in endurance rides. *Equine Veterinary Journal,* 42(38): 142 – 146.

WHITE, S. D., EVANS, A. G. and VANMETRE, D. C. (2000). Diseases of the skin, melanoma. Pages 1225 – 1226. *In:* SMITH, B. P. (Ed.). *Large Animal Internal Medicine.* Elsevier Mosby, St. Louis, Missouri, USA.

WILSON, D. A. (2011). *Clinical Veterinary Advisor: The Horse*. Saunders, Elsevier, USA.