



Case Report

Autologous Platelet Concentrates as an Adjunctive Treatment for Chronic Laminitis in a Mare with Pituitary Pars Intermedia Dysfunction

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ABSTRACT

The aim of this article was to describe a case of a 7-year-old mare with chronic laminitis secondary to pituitary pars intermedia dysfunction that was successfully treated with autologous platelet concentrates (APC) obtained by the tube method, 4 months before being treated with oral pergolide. After the diagnosis of pituitary pars intermedia dysfunction, the patient was treated with three intralesional injections of APC at 10-day intervals. APC presented a mean concentration of $430 \pm 22 \times 10^6$ platelets and 8.6 ± 1.3 leukocytes/mL. The treatment with APC produced growth of the hooves at a rate of 5 mm/wk and substantially reduced the foot pain (lameness) after two APC applications. The mare could be ridden 2 weeks after the third APC treatment. The treatment with oral pergolide 4 months later improved the clinical picture of the patient, albeit hirsutism remained. APC could be useful as adjunctive treatment of chronic laminitis in horses. However, additional clinical studies are necessary to determine the safety and effectiveness of APC in chronic laminitis.

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1. Introduction

Equine Cushing disease (also termed pituitary pars intermedia dysfunction [PPID]) is the most common endocrinopathy described in equine species and one of the more important causes of chronic laminitis in these animals [1]. PPID is characterized by dysregulation of dopaminergic neurons of the pars intermedia that increase the synthesis of proopiomelanocortin accompanied with increased plasma concentrations of adrenocorticotropic hormone, β -endorphin, and melanocyte-stimulating hormone [2]. The symptoms in horses include chronic laminitis, hirsutism, bulging supraorbital fat, abnormal fat distribution, foot abscess, and hyperhidrosis. Other less frequent symptoms are muscle wasting, polyuria/

polydipsia, lethargy, exercise intolerance, infertility, skin infections, and weight loss, among others [1,2].

Several theories for PPID-induced laminitis have been proposed. Endogenous corticosteroids (overproduced in horses with PPID) sensitize the digital venous and arterial endothelium to the catecholamines effects, with subsequent hypoxia of the lamellar tissue. These substances can also produce catabolic effects that potentially affect the integrity of the lamina [2]. Increased plasma cortisol concentration observed during PPID produces insulin resistance [3,4], which in turn affects endothelial regulation of vasomotor tone (vasoconstrictive influence) and promotes a prothrombotic endothelial phenotype. Finally, laminitis could be developed as a result of vasoconstriction and platelet/leukocyte adhesion to endothelial surfaces of the lamellar tissue [5].

Pergolide, a long-acting dopaminergic agonist, remains as the cornerstone treatment for PPID in horses [1]. However, 15–20% of PPID patients with laminitis are nonresponsive to the treatment with this drug [1,6]. Indeed, many patients with PPID with refractory laminitis

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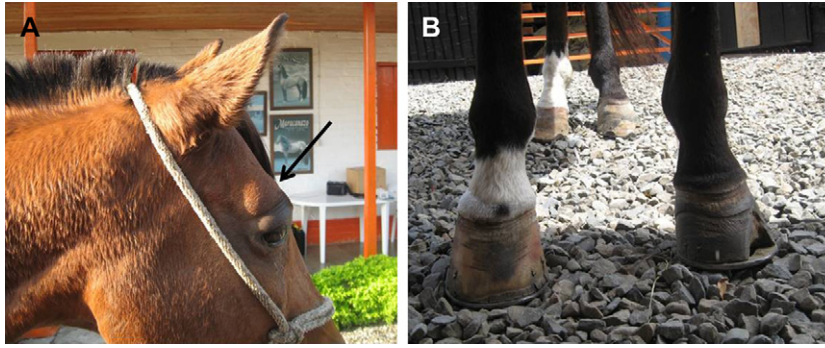


Fig. 1. A 7-year-old mare with Cushing disease and secondary chronic laminitis. (A) Note the bulging of the right supraorbital fat. (B) The left forelimb presents a severe wall defect.

to the pergolide potentially could be subject to humane destruction [6].

Autologous platelet concentrates (APC), also known as platelet-rich plasma (PRP), are an important source of growth factors (GFs), including transforming growth factor betas (TGF- β s) [7,8], platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), and hepatocyte growth factor (HGF) that potentially could improve the wound-healing process [9], which is hindered in chronic laminitis cases [10]. There is clinical evidence in humans [11] and horses [12,13], indicating that APC are useful to accelerate the repair of acute and chronic musculo-skeletal lesions in both species.

A case of chronic laminitis in a mare with PPID treated with intralesional injections of APC is described in this report. This patient demonstrated a clinical improvement of the chronic founder before being treated with oral pergolide.

2. Case Report

2.1. History and Clinical Findings

A 480 kg 7-year-old mare with a history of infertility was evaluated for chronic laminitis of the four limbs for

a duration of 8 months. The mare was examined and was found to have severe lameness of all the limbs while walking (Obel degree III/IV), especially of the forelimbs. The temperature, pulse rate, and respiratory rate were within normal limits. On examination, the mare was quiet and alert and had a body condition score of 9/9, with a rectal temperature of 38°C, heart rate of 44 beats/min, and respiratory rate of 30 breaths/min. Mucous membranes were normal and had a capillary refill time of 2 seconds. Gastrointestinal sounds were normal. The mare presented bulging of the supraorbital fat pads (Fig. 1A) and hirsutism. The hooves presented wall defects related with chronic abscesses (Fig. 1B). Radiological analysis of the four digits revealed slight displacement of the third phalanx (laminitis radiological degree I/IV) of the right forelimb (Fig. 2A) and both the hind limbs. The third phalanx of the left forelimb presented a laminitis radiological degree of II/IV (Fig. 2B).

Complete blood count results were normal, although relative values of neutrophils were increased (82%, reference values [RV]: 33%–70% [14]) and the relative values of lymphocytes were decreased (18%, RV: 24%–60% [14]). In contrast, serum biochemistry results were within reference ranges.

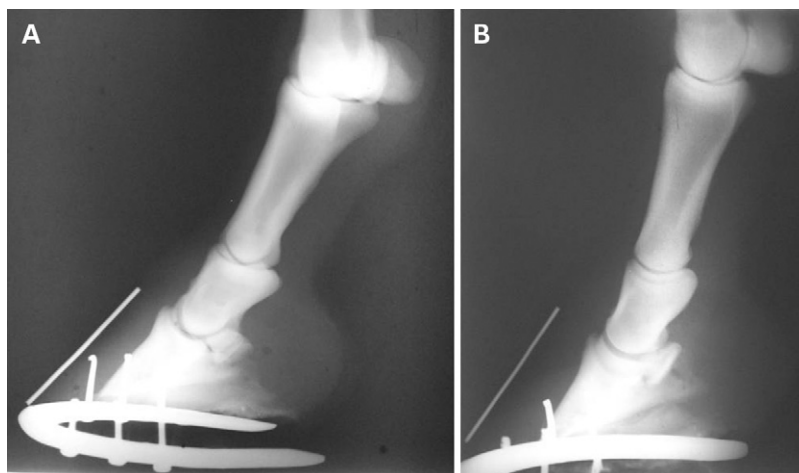


Fig. 2. Lateral radiographs of the forelimbs. (A) Right forelimb with slight displacement of the third phalanx (laminitis radiological degree I/IV). (B) Left forelimb with moderate displacement of the third phalanx (laminitis radiological degree II/IV).

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