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CASE REPORT OPEN ACCESS

PARALYSIS OF RADIAL NERVE IN MARE THOROUGHBRED RACE HORSE - CASE REPORT

***[1]Pagliarini, R., [2]Abascal, N., [3]Azevedo da, S. Marcos and [4]Pereira C. F. Roberta**

[1]Self-Employed Veterinary Ijuí, Rio Grande do Suk, Brasil
[2]Medical (a) Self-Employed Veterinary (a), Bagé, Rio Grande do Sul, Brazil
[3]DVM, MSc. Ph D. Department of Veterinary Medicine, Federal University of Pampa, Uruguaiana, Rio Grande do Sul, Brazil
[4]DVM, MSc. PhD. Department of Agrarian Studies in Regional State University of Northwestern, Ijuí, Rio Grande do Sul, Brazil

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ABSTRACT

The present case report aimed to describe a case of radial nerve palsy caused by a shock, in which two types of therapeutic treatment and physiotherapy were used, with emphasis on the physiotherapeutic treatment.

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INTRODUCTION

Among the brachial plexus nerves, lies the radial. This has its origin mainly in the nerve roots between the intervertebral space C7 (cervical seven) and T1 (thoracic one) plexus. The radial nerve is divided into two branches i: deep branch that innervates muscle and side ulnar carpal digital extensor muscle; II: superficial branch follows in lateral direction between the lateral head of the triceps muscle and the radial carpal extensor muscle and innervate the triceps muscle of the forearm fascia tensor and anconeus (STASHAK, 2002; ASHDOWN & DONE, 2012). Lameness in horses caused by the radial nerve palsy has low occurrence and is manifested through the animals inability to extend the elbow, carpus and digit. Usually this change is due to an injury to the nerve root by trauma or compression, which is common in animals that remain in prolonged lateral decubitus, above 280 minutes.

****Corresponding author:*** **Pagliarini, R.,**
Self-employed Veterinary Ijuí, Rio Grande do Suk, Brasil.

The result of this compression of the radial nerve, generates a postural change that can be temporary or permanent (STASHAK, 2002; WAGNER, 2009). Similarly, some animals affected by these nerve lesions, can present muscular atrophy by the absence of movement of muscles and a lack of innervation on the lesioned member, and are predisposed to the development of lameness in contralateral limb due to the excessive support on the hull. In young animals, this injury can cause angular deviations in the limbs and imbalance in growth. This occurs, for disorderly closure of epiphyseal plates, causing angular deformities in fore and hind limbs (SCHAER & ORSINI, 2007). This paper aims to describe a case of radial nerve paralysis in a Thoroughbred mare, caused by trauma to the right forelimb.

MATERIALS AND METHODS

A 7-year-old mare, thoroughbred,was subjectedto clinical examination lameness grade V (AAEP) in the right forelimb. In the interview held with the handler, it was reported that the horse was in a paddock with other animals and had suffered a

collision with another animal, causing trauma to the right forelimb. Immediately after the incident, the animal showed inability to support the affected limb and extension of the humeral radio-ulnar joint and the digit. As consequence of the injury, the animal had entrainment of the hull on the ground clamp to walk. There was neither on palpation and nor crackle in the affected region. Radiography was done on the proximal region of the right forelimb to check possible fracture in the humerusbones, radius and ulna, however no radiological changes were observed consistent with fractures. Based on clinical examination, history of trauma and absence of radiographic images in fractures, it was opted for the use of nonsteroidal antiinflammatory drugs (phenylbutazone 2,2 mg/kg/SID/IV for 3 days, dimethyl sulfoxide (DMSO) 1g/kg/SID/IV for 3 days) and steroid (dexamethasone 0,02 mg/kg/SID/IV for 3 days). In addition to the drugs used, associated to treatment, physiotherapy twice a day with laser therapy, electrical stimulation, controlled exercise with walking and massage with electric massager for 15 days.

RESULTS AND DISCUSSION

After 7 days of initiation of treatment with prescribed medication and physiotherapy sessions, the mare showed an improvement of 80% clinical, based on progression that the animal was able to support the member on the ground. After 10 days of treatment, the animal supported and used the right forelimb during locomotion and had no more lameness. The trauma of the right forelimb resulted in radial nerve palsy, causing dysfunction in the tensor muscles of the forearm fascia and anconeus. In the distal third of the arm, the nerve sends muscle branches that make up the extensor muscles of the carpus and fingers, including the lateral ulnar muscle and which also results in loss of sensitivity to skull side aspect of the forearm (ROSS & DYSON, 2011). The prolonged lateral decubitus, sometimes in surgical procedures, where there is the right padding of the scapular region, shoulder and elbow, can determine the compression thereby causing blockage of innervation in every member. As result of this block, the animal does not support the member, and features "fallen elbow" posture, and exhibits hull caliper drag on the ground. The stance adopted by the animal may initially be confused with myopathy triceps muscle and olecranon fracture (ROSS & DYSON, 2011). However, the history of the animal, clinical examination and additional tests establish the differential diagnosis for this case.

For the recognition of postural changes that affect the forelimbs, the radiological study has important role in the differential diagnosis, it is essential to rule out possible fractures in the scapular region and shoulder (WAGNER, 2009).Moreover, another important tool for characterization of radial nerve palsy lesions is the use of workup by analysis of biochemical enzymes such as creatine kinase (CK) and aspartate aminotransferase (AST), which will be found high in cases of myopathy by prolonged recumbence (STASHAK, 2002), however these tests have not been used to assist in diagnosis since that at the anamnesis there was a history of recent trauma. Once established the diagnosis of radial nerve palsy, treatment was instituted with the administration of steroidal antiinflammatory, non-steroidal and rest with restricted movement, as described in this work. The nonsteroidal antiinflammatory should be included in the initial phase of illness to reduce local inflammation and the steroidal anti-inflammatory to reduce swelling l (STASHAK, 2002). In this case we used dimethyl sulfoxide (DMSO) having substances which contain substances that decrease the superoxide production (antioxidant action). In cases of paralysis in the radial nerve in the presence of external edema, DMSO is used topically in the scapular region, which is rapidly absorbed, being able to be disseminated via hematogenous and penetrate the blood-brain barrier leading to a decrease in production prostaglandins by the central nervous system (SPINOSA, 2010). However, in the aforementioned caseis prescribed the use of DMSO intravenously for a quick anti-inflammatory action that DMSO has in its metabolite, dimethyl sulfide, which is to remove free radicals, especially hydroxyl. DMSO also have analgesic propertiesdue to depression of the conduction of afferent nerve impulses, which depart from the inflamed areas. It has the property of reducing platelet aggregation, promotes chemotaxis, protect the vascular endothelium, decreasing thrombus formation and improve tissue perfusion. DMSO increased membrane permeability and this may facilitate the absorption and action of corticosteroids on its site of action. The horses treated with DMSO, may present areas of alopecia, which can predispose a skin infection (SPINOSA, 2010). The steroidal antiinflammatory drugs, have are able to block theeffect from the earliest manifestations of the inflammatory process to the later as repair and tissue proliferation. It is known that the anti-inflammatory perform their duties acting in various aspects such as organic response to injuries, influencing cellular events, vascular events and metabolism of pro inflammatory mediators (SPINOSA, 2010).

According to Ring and Bishop (2009), the success rate of treatment of radial nerve paralysis in horses, using only a nonsteroidal anti-inflammatory drugs, is less than 40%. Wagner (2009) recommends the use of anti-inflammatory drugs such as phenylbutazone (4 mg/kg intravenously) with intravenous fluid therapy to promote diuresis and elimination of myoglobin and sometimes acepromazine (0,02 to 0,03 mg/kg intravenously) to promote vasodilation and improve muscle perfusion. In some cases, the use of cotton bandage and polyvinyl chloride (PVC) splints as complementary treatment may be an option for improving animal weight support and also keep the limb affected by paralysis in extension to the resolution of neuropathy (STASHAK, 2002; BISHOP e RING 2009). Physical therapy has become an important alternative in prominent medical clinic horses, because it has shown great results that assist in the rehabilitation of the locomotor system of horses diseases (PORTER, 1998). The choice of mode and protocol used in the horsesrehabilitation is determined by the clinical state of the animal or the damaged structures (VEENMAN, 2006). Some techniques, such as hydrotherapy, shock wave therapy ("shockwave"), laser therapy and electrotherapy are being used with some success. Furthermore, they can be used as supplementary therapy treatment, stretching and massage members (VICARIVENTO et al., 2008, PERRELLI & PALHARES, 2002; VEENMAN, 2006). In the case reported we chose to use laser therapy, electrical stimulation, controlled exercise with walking and massage with electric massager. As differential diagnoses, the following should be considered:humerus fractures and the olecranon, triceps muscle rupture, tumors and abscesses in the scapular region (BASSAGE & ROSS, 2011). In paralyzes affecting the radial nerve, we have as a primary cause lameness, being an uncommon condition that results in the inability to extend the elbow, the carpus and the digit. This postural change can also be observed in other diseases involving the elbow

(STASHAK, 2002). According to Adams (2002), in most cases, the prognosis is unfavorable. When a horse has radial nerve palsy as a result of injury, either by compression or by trauma, there may be a partial or total recovery.

Conclusion

The diagnosis of radial nerve palsy was possible to be done by clinical examination and laboratory tests. The treatment with nonsteroidal anti-inflammatories and non-steroidal associated with therapy was effective for treatment of radial nerve palsy described in this case.

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