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Recurrent equine laryngeal alteration associated with compression of nerves in the infra-auricular region similar to Eagle Syndrome in humans: Case report

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Abstract. A mare presented headshaking, along with signs of problems in the upper respiratory tract. After a detailed clinical examination, an endoscopic examination was performed and an asymmetry was found to the left of the laryngeal cartilages. Searching for a probable etiology for the endoscopic finding, an ultrasound examination was performed in the infra-auricular region (parotid region) bilaterally and comparatively. The ultrasound examination showed a deviation (on the left side) of the nerve bundle corresponding to the deviation of the cartilages and soft palate, from which we associated the findings with the clinical presentation by the mare and concluded that it was the cause of the problem. Comparing this case, specifically, with Eagle Syndrome in humans, the aforementioned findings were very similar to the syndrome in humans.

Keywords: Eagle Syndrome, equine endoscopy, equine ultrasound, horses, respiratory disease in horses, headshaking

Alteração laríngea recorrente em equinos associada à compressão de nervos na região infra-auricular semelhante à Síndrome de Eagle em humanos: Relato de caso

Resumo. Égua apresentando tremor de cabeça e sinais de problemas no trato respiratório superior, após exame clínico detalhado optou-se por realizar exame endoscópico e foi constatada assimetria à esquerda nas cartilagens laríngeas. Em busca de uma provável etiologia para o achado endoscópico, foi realizado exame ultrassonográfico da região infra-auricular (região parótida) bilateral e comparativamente. O exame ultrassonográfico evidenciou desvio (do lado esquerdo) do feixe nervoso correspondente ao desvio das cartilagens e palato mole, onde associamos os achados ao quadro clínico apresentado pela égua e concluímos que foi a causa do referido problema. Comparando este caso, especificamente, com a Síndrome de Eagle em humanos, os achados acima mencionados foram muito semelhantes aos da síndrome mencionada em humanos.

Palavras-chave: Síndrome de Eagle, endoscopia equina, ultrassonografia equina, cavalos, doença respiratória em cavalos, balanço de cabeça

Introduction

Eagle Syndrome, in humans, is characterized by odynophagia, otalgia, odontalgia, sialorrhea, dysphagia, headache, facial pain, nonspecific neck pain resulting from compression of the facial (VII pair), glossopharyngeal (IX pair), vagus (X pair) and accessory (XI pair) or by the hyoid style complex (represented by the styloid process and the growth of the hyoid bone), both of origin from the second branchial arch (Gonçalves et al., 2003; Guzzo et al., 2006; Higino et al., 2008; Lunas et al., 2016; Rizzatti et al., 2004; Tiago et al., 2002).

This pathology is still complex in humans, but there is the presence of nerve compression causing chronic pain and neurological deficits in the cranial nerves (VII, IX, X and XII) located in the parotid region and may have a diverse and complex etiology (Ribeiro et al., 2023; Sampaio et al., 2020). In horses, the complex laryngeal region as well as its innervation, motility, when it exists, for various reasons such as some irregularity in its morphology, physiology, we can have as a consequence one of the causes of Low Performance Syndrome as well as respiratory problems, since the presence of inspiratory wheezing, non-specific coughing, headshaking, choking, false passage (Vasconcellos, 2019, 2022, 2024) as well as other manifestations of pain translated as aggressive behavior, difficulty or pain when using a halter or bridle (or any other means of conduction used in the horse's mouth), facial and cervical hyperalgesia (Oliveira & Massucato, 2009; Sampaio et al., 2021).

In the infra-auricular region (region between the auricular parotid muscle, parotid gland, mandibular gland and retropharyngeal lymph node) of horses, similar to humans, the facial (VII pair), glossopharyngeal (IX pair) and its pharyngeal branch nerves are located. , the laryngeal branch of the hypoglossus and vagus (XII and).Endoscopy is necessary to diagnose obstructive diseases of the upper airways, in addition to alar fold collapse, which can be diagnosed by placing a temporary suture to keep the nostrils open. Several abnormalities can be diagnosed at rest (epiglottic entrapment, subepiglottic cysts, epiglottitis, arytenoid chondritis, rostral displacement of the palatopharyngeal arch and complete collapse of the arytenoid cartilage (Vasconcellos, 2024). However, endoscopic examination during exercise (dynamic) is necessary for the diagnosis of dynamic disorders, including nasopharyngeal collapse, intermittent dorsal displacement of the soft palate, epiglottic retroversion, medial deviation of the aryepiglottic folds, and arytenoid collapse. Dynamic endoscopy is also recommended if rostral displacement of the palatopharyngeal arch is found during resting endoscopy to evaluate for any other upper airway abnormalities associated with the malformations. It should also be borne in mind that horses may present with nasopharyngeal collapse during resting endoscopy, which is not present during dynamic examination (Ducharme & Cheethan, 2014; Vasconcellos, 2019).

Materials and methods

A 10-year-old Thoroughbred mare showed clinical signs of headshaking, "choking", sneezing, low athletic performance, increased tiredness during and after physical activity, but without a runny nose. During the dental examination, no visible changes were found. Upon clinical examination carried out at rest, he presented a heart rate of 24 (bpm/ECG at rest with a normal tracing), respiratory rate of 20 (mpm), no fever, complete vaccination history, deworming, kept on pasture and with supplementation. of salt and feed. Upon auscultation of the trachea and lung field, no inspiratory and expiratory rales were detected, as well as chest palpation with no sign of pain, normal chest movement during inspiration and expiration, and no atrophy on the right or left sides. A blood count was performed, where the hematological parameters (both the white and red series) were within normal limits. A thermographic examination was also carried out looking for any hotspot region but with no finding, no skeletal muscle changes and for this reason no biochemical examination was carried out, looking for muscle damage, but everything within normal limits.

As there were only signs of alteration(s) in the upper respiratory tract, videoendoscopy was chosen to elucidate the above events and other probable unrelated causes such as possible obstructions and congenital malformations. For this purpose, a multidirectional video endoscope, with a diameter of 8 mm, was used. capable of recording images in photo and video, where the images (photos and videos) were later analyzed. On examination, pharyngeal folding and an asymmetry in the visual field accentuated to the left were noted, after positioning the endoscope centered in accordance with the cartilage's laryngeal structures (Figure 1A), avoiding the production of shadowing, lateralization of the image or even a lateral angle view, which could compromise the symmetry of the cartilages, a fact of extreme importance in the diagnosis. Also, during the examination, there was a palatal asymmetry (soft palate) but accentuated on the left (Figure 1B) and also an increase in the space between the left laryngeal ventricle and the left epiglottic arythene fold (Figure 1C), which indicated a unilateral lesion and therefore it could be of neurological origin.

Aiming to find any changes in the region where the probable nerves would be or would be found anatomically, an ultrasound examination was carried out in the right and left infra-auricular region

(parotid region) aiming at comparing both and searching for a possible explanation for this accentuated asymmetry to the left in the pharynx. On external examination, in that region, macroscopically there was no asymmetry between the right and left sides as well as no skin lesion or increase in volume.

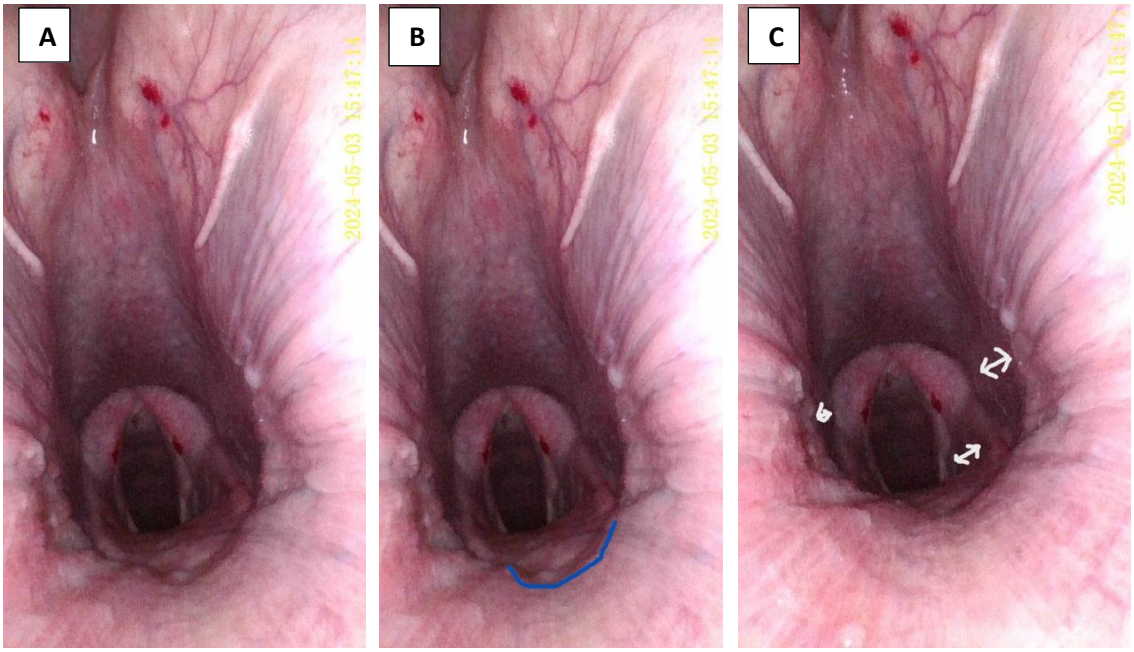

Figure 1. **Figure A** Shows the oropharynx region and **figures B** and **C** show asymmetry to the left of the structures indicated such as the region between the laryngeal ventricle and the aryteno-epiglottic ligament, as well as the "striation" on the walls of the oropharynx.

For the ultrasound examination, a portable device (Infinity V) with a linear transducer at a frequency of 5.0 MHz was used, making a linear scan simply seeking to cover the largest possible field longitudinally (Figure 2A).

On examination, comparing the right side with the left, we found an increase in volume and contour of the left retropharyngeal lymph node (anechoic ring), diverting the nerve bundle downwards, compressing it, when compared to the right side (Figure 2B). We associate this ultrasound finding with the videoendoscopic examination, as the nerve bundles and their branches from pairs VII, IX, X and XII (Budras et al., 2003), asymmetry presented in the oropharynx (Figures 1C e 2B) being on the same side as the lesion found sonographically.

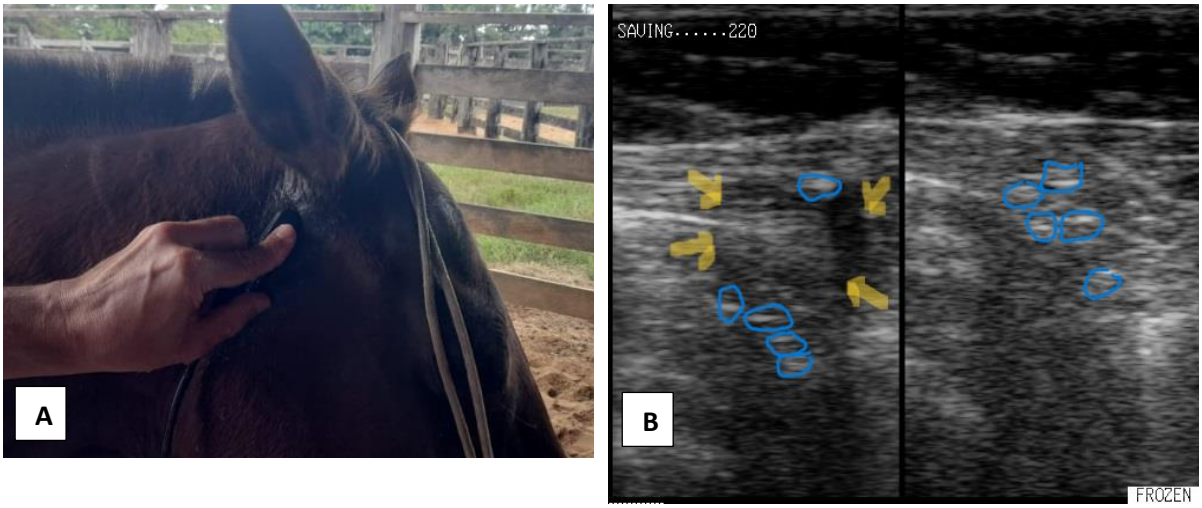

Figure 2. In **figure A**, we used for ultrasound examination in the infra-auricular region, the longitudinal section aims to cover the largest possible portion together with a linear transducer; **Figure B** shows the displacement of the left regional nerve bundle (**blue rings**) (normal on the right), together with an anechoic allo (**yellow arrows**) in the retropharyngeal lymph node.

Discussion

The importance of video endoscopy in the examination of the upper respiratory tract in horses helps us visualize problems that we can record either through video or through photos that we analyze later and calmly identify, when there are small details as shown here in the images in figures 1, they can be marked, measured, qualified and quantified and most importantly stored.

Low Performance Syndrome, as well as headshaking in athletic or non-athletic horses, has an etiology as complex as problems located in the oropharynx. In the oropharynx, its multiple innervation, anatomy and physiology still have more questions with few answers, where diagnoses are not always accompanied by an explanation of its pathophysiology; specifically in this case where compression and deviation of the nerve bundle located in the region where the cranial pairs (VII, IX, then identified as well as its pathophysiology, injuries and findings also very compatible with those identified in Eagle Syndrome in humans, with the same symptoms and etiology presented by this horse.

In humans, this syndrome would have a surgical treatment where the growth of the styloid process and its compression after removal would remove the pain in the region of the ear, throat, teeth, anterior part of the esophagus and with a positive evolution. Surgical intervention was proposed to the owner to debride the compression and displacement of the nerve bundle identified by the ultrasound examination, but to date we have not received authorization for the procedure.

Another important point to be discussed would be the ultrasound evaluation of the aforementioned infra-auricular region (parotid region, still very little studied and documented) which proved to be of great clinical importance, due to the findings shown here, the presence of the mentioned cranial nerves and their probable involvement with pathologies of the oropharynx in horses, where trauma (fractures), inflammation (sialocele), infections (e.g. *Streptococcus* spp) could cause the same symptoms given the "superficiality" of the aforementioned nerves as well as the presence of glands (parotid and mandibular) and lymph nodes (retropharyngeal), which could have their sizes increased (Budras et al., 2003; Vasconcellos, 2019, 2024) and perhaps one of the causes of headshaking in horses.

We conclude, therefore, with these findings, that endoscopy is of fundamental importance in the diagnosis of respiratory problems in the upper airways in horses, as well as in problems with low performance (located in the upper airways), as well as the associated ultrasound, as they are exams easy to carry out as long as they are carried out by a professional who is properly familiar and experienced with image diagnosis and the problems to be encountered (Vasconcellos, 2019). We can also say, specifically in this case, that the imaging findings are very compatible with Eagle Syndrome in humans.

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