Behavioural Changes in a Ten Year Old Gelding that Presented with Palatal Instability, and Observations Made following an Oral Palatopharyngoplasty

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Abstract: A 10 year old ex race horse now three day eventing, was diagnosed with palatal instability (PI) by the author and presented with numerous behavioural issues which were thought to be associated with the condition. An oral palatopharyngoplasty was performed and following an eight week post operative rest period the horse resumed training. Over the following six months significant changes to the horses attitude and performance were observed and recorded including an apparent return to recumbent sleep, which had not been observed in the two years preceding surgery. The importance of including altered behaviour when working up suspected cases of upper airways obstruction in sports horses is discussed.

Keywords: Oral palatopharyngoplasty, palatal instability, altered behaviour, oropharyngeal seal, horse.

INTRODUCTION

The upper airways procedure referred to as an oral palatopharyngoplasty (OPP) [1] had been used since the late 1980's to treat horses that presented with disruption of the oropharyngeal seal (OPS) [2,3]. This disruption was more recently referred to as palatal instability (PI) [3-5], which in some cases progressed to dorsal displacement of the soft palate (DDSP) [4,6]. Significant reductions in training and race related irritable, nervous and reluctant behaviour [7] following OPP procedures had been previously reported.

In this report the behaviour of a 10 year old ex race horse now three day eventer had deteriorated to the point where it was considered dangerous to both handle and ride. The study was performed to demonstrate possible associations between upper airways obstruction and altered behaviour. This, as far as the author was aware had not been previously reported on in sports horses.

CASE REPORT

An 8 year old thoroughbred gelding with several years of show jumping and dressage training was purchased in May 2013 with the intention of competing in three day events. The horse had raced eleven times and was retired from racing with a tendon injury at 5 years of age. As a racehorse it was described as relaxed and willing. However the horse's behaviour with the owner from whom it was purchased prior to this study was unknown.

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For its new owner, at home it would firstly rear and buck whilst in the tie-ups and then once saddled spin around, rear and on some occasions lie down rather than be ridden. At it's first dressage and jumping lesson it began rearing, spinning, bucking and stopping without warning.

Over the following weeks it proved to be difficult to catch, unpredictable, aggressive including to other animals. In one instance it attacked and killed a lamb. It was also inattentive and what was most concerning was that it continued to kick out without warning. In frustration the owner then retired it to a paddock for 3 months.

Following this rest period, an experienced horse person, who had been there to observe these abnormal behaviours, volunteered to take on the horse's education. Intensive training began with countless hours of one on one, with the trainer constantly demanding the horse's attention at the times when these unwanted behaviours were normally exhibited. The behaviour gradually improved although the habit of suddenly stopping mid canter in what appeared to be a state of panic continued. It would resent immediate attempts to have it move on. On the first occasion, when asked to move forward, the horse reacted by rearing spinning and crashing into trees with little sense of self preservation. The rider leapt from the saddle. This same behaviour was manifest if the rider first asked the horse to stop and then move on immediately. The rider then learned that if she waited for a minute or two, for the panic to subside, the horse would then move on. Progress was being made but then a paddock injury necessitated a twelve month rest. Frequent dressing changes and wound treatments

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served to further enhance the trust between horse and handler and yet there was still a strong sense of unpredictability.

When training resumed the horse's behaviour continued to improve. The only gear adjustment was that a noseband which was part of the horses regular gear, as it would work with it's mouth wide open if allowed, was slowly loosened but at the same time retained. Eventually, it was decided to compete in a three-day event. The improved behaviour resulted in an extremely promising dressage test and show jumping round however in the cross country the horse twice pulled up. Interestingly this did not occur at obstacles but in between them and more often when an incline in the ground was encountered.Two weeks later at the next event the disruptive behaviour returned in all disciplines.

The horse was then presented at the author's clinic.

A general examination including medical, orthopedic and spinal components revealed no significant abnormalities. In obtaining a full history including behavioural changes, several potentially relevant issues arose. Firstly if allowed the horse would always open its mouth whilst under saddle but not when free in a paddock. The horse was also not very active in the paddock. Secondly the horse had never been seen in lateral recumbency, yet rolled freely and frequently in the sand.

Episodes of pulling up in work only occurred during canter or gallops and most often when confronted with an incline. Having frequently encountered racehorses that exhibited similar reluctant behaviour that were subsequently diagnosed with upper airways obstructions, it was decided that a respiratory examination was appropriate. There had however been no history of abnormal noise during exercise or of abnormal respiratory recovery after exercise.

Resting endoscopy revealed a normal larynx and the soft palate did not displace freely however examination of the mid free border of the palate revealed an irregular erosion with inflammation. The tracheal and bronchial mucosa was also significantly inflamed.

The palatine erosions were typical of what would in the past be suggestive and more often diagnostic for chronic DDSP. However in the author's opinion this was more likely to indicate palatal instability PI without progression to DDSP, as characteristic gurgling or rattling sounds had not been heard in this case.

The decision to perform an oral palatopharyngoplasty [1] was taken. The aim of the surgery was to reduce the incidence of PI and potentially any altered behaviours that may have been associated with this condition. Post operatively the horse was rested for 8 weeks [1].

During this period the horse's paddock activity increased and it was seen regularly in lateral recumbency. It also put on weight and in time was on a reduced diet. Its coat which was always described as thick and wiry was now normal. Its behaviour towards other animals changed. It would now share hay and feed with others including a donkey that it previously would attack.

The horse could now be tied to the float or van for hours and remained relaxed. Traveling behaviour changed as prior to surgery the owners thought the horse suffered from claustrophobia. It had been reluctant to load and was agitated and restless when on the road. It was now a good traveller.

It was also now described as a relaxed, kind horse that actually sought attention and would approach the owner when the bridle came out. At shows the horse was said to be one of the most relaxed and best behaved. There had also been no environmental changes or changes to training protocols. In addition the unpredictable incidents of pulling up in work ceased. The noseband was also removed as the horse no longer attempted to open its mouth whilst under saddle.

DISCUSSION

As much as the behavioural changes in this animal appeared dramatic, they were actually predictable. An OPP was performed to stabilise the soft palate, by improving the efficiency of the OPS [2,3]. The horse had previously reverted to obtaining air via both the oral and nasal routes during inspiratory efforts. The oral intake of air was seen as a means of supplementing reduced nasopharyngeal supply during inspiration [2]. This instability could then progress to nasopharyngeal collapse. Postoperatively the horse was prepared to and in fact chose to breathe nasally only as was the norm for an obligate nasal breather. This was reflected in the negation of its necessity to work with its mouth open. Behavioural changes associated with this

condition had been previously reported in race horses [2,7].

Improvements in feed conversion, body weight and coat quality were often reported following OPP surgery. These were generally associated with the improvement in respiratory health, associated with a reduction in lower airways contamination and inflammation [2]. This airway inflammation or inflammatory airways disease (IAD) had been statistically linked with cases of PI [8].

A return to recumbency and assumed paradoxical sleep [9-11] had been noted by the author on numerous occasions following this procedure in previous patients. To achieve paradoxical or REM sleep the horse must firstly assume lateral recumbency and then relax completely [9]. Nasopharyngeal airway patency is normally maintained by increased tone in the supporting palatine and pharyngeal musculature. In horses that are prone to different forms of upper airways obstruction (UAO), these events quite often occurred during periods of reduced pharyngeal muscle tone which were associated with the onset of exercise fatigue. It was then conceivable that these obstructions could also occur with reduced muscle tone during periods of deep or paradoxical sleep. Repeated episodes of collapse may encourage the animal to seek other postures of a non-recumbent nature where sleep would not be interrupted. It would then be unable to achieve paradoxical sleep. Environmental and orthopedic issues had been reported to influence the likelihood of a horse achieving paradoxical sleep [9,10]. However this horse always had company including female, was able to get up and down as it frequently rolled and following surgery the same paddock mates were present. The habit of pulling up suddenly had also been reported previously in race horses [7] with palatal instability and pharyngeal dysfunction. When nasopharyngeal collapse occurred some horses would firstly panic, and then attempt to pull up. They would then swallow and in doing so on most occasions restore the patency of their nasopharyngeal airway. After this, they were often willing to move on again. In addition galloping on an increasing incline was accepted as a means of increasing the negative pressures being applied to the upper airways in exercising horses and thus could promote PI [12] and UAO [8].

The change in attitude of this horse between its two three day events just prior to surgery could also be explained. In race horses following a variety of upper airways procedures there were often reports of improved attitudes and willingness to perform in training prior to their first race. This seemingly reflected improved upper airways function. The first race performance could also reflect this improved confidence. However it was not until the most severe negative pressures were encountered, being the last 400m to 600m of the race, that the animal would seemingly make its own determination on the efficiency of its upper airway. A return to preoperative nervous and reluctant behaviour following the first one or two races would suggest that the clinical improvement although significant was not sufficient to facilitate confident racing. Progressive and then maintained improvements in both attitude and performance accompanied a more successful outcome rather than short term improvement.

In this case a twelve month rest and time away from eventing coupled with improved confidence derived from considerable one on one training, led to an improved attitude which was exhibited at the first cross country event. However this newly acquired confidence clearly dissipated at the second cross country event two weeks later when the horse refused.

This horse presented with a reluctance to cooperate with tasks that were in any way associated with an event or events that may have culminated in upper airways obstruction. This reluctance was exacerbated when the horse was forced to wear a tight nose band which reduced its ability to take air orally during inspiratory efforts which was a habit often reported with horses that presented with PI. In addition it was likely that the horse was sleep deprived, and for some considerable time, which would have contributed to its irritable nature.

In a recent study of 129 sports horses that presented for respiratory noise, poor performance or routine evaluation PI was diagnosed in 91% (64/70) of the horses referred for respiratory noise and in 71% (29/41) of horses referred for poor performance [8]. In the past this condition was thought to be only associated with racehorses. In assessing the worth of an ever growing number of upper airways procedures, the only two measures of success appeared to be noise elimination and or improved race performance. However a horse's reluctance to enter an arena or to apply maximal effort are also significant factors when dealing with sports horse pursuits such as dressage, show jumping and eventing. It was hoped that in the future additional measures of success such as the

elimination of race or event associated nervous or reluctant behaviour would be employed.

AUTHORS' DECLARATION OF INTERESTS

No affiliations and no conflicting interests have been declared.

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