Laser Assisted Modified Forssell’s Procedure for Treatment of Cribbing in Horses

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The modified Forssell’s procedure with a more rostral transection of the sternohyoideus and omohyoideus muscles using either an Nd:YAG or CO2 laser alleviated cribbing in 14/14 horses. The success obtained with this method is greater than previously reported. Authors’ address: Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA 70803. © 2001 AAEP. *Presenting author.

1. Introduction
Cribbing is an acquired stereotypic oral behavior in which a horse grasps a horizontal solid object with its upper incisors, contracts its ventral neck muscles and arches the neck, retracts the larynx, and pulls backward.1 The etiology of cribbing is unknown, although the most common causes cited are boredom or frustration.1–3 Sequelae to cribbing include poor performance, weight loss, excessive incisor teeth wear, and flatulent colic.1 Various non-surgical and surgical procedures have been described for treating cribbing in horses.1,4 Forssell developed a technique for alleviating cribbing by removal of portion of the sternomandibularis, omohyoideus, and sternothyrohoideus muscles.5 This technique resulted in disfigurement of the horse’s appearance owing to the resection of the sternomandibularis muscles.6 A modification of Forssell’s procedure was developed which consists of removal of portion of the sternothyrohoideus and omohyoideus and neurectomy of the ventral branches of the spinal accessory nerves, supplying motor function to the sternomandibularis muscles.7,8 Success rates reported vary depending on the treatment used.8,9 Postoperative relapse may be related to seroma or hematoma formation following surgery, leading to tendon-like fibrous tissue between the cut ends of the muscles.10 Reduction of the amount of remaining muscle ventral to the larynx may reduce the development of tendon-like fibrous tissue between the cut ends of the muscles. In an attempt to alleviate recurrence of cribbing, a modified Forssell’s technique with more rostral transection of the sternohyoideus and omohyoideus muscles was performed using either an Nd:YAG or CO2 laser to reduce seroma or hematoma formation. The purpose of this article is to describe the technique used for treatment of cribbing and report the outcome in 14 horses.

2. Materials and Methods
Fourteen horses were treated for cribbing using this technique between 1994 and 2000. The horses’ age ranged from 1 to 12 years (median of 7 years). Although the exact duration of the stereotype was difficult to determine, based on history, 12 horses were considered chronic cribbers (more than 2 years).
and 2 horses were acute cribbers (1.5 and 4 months). Historically, all horses were confined to a box stall between their exercise regimens.

Surgery, performed under general anesthesia, involved a 34-cm ventral midline skin incision. The incision started approximately 2 cm rostral to the ventral larynx, at the point of the hyoid apparatus and extending caudally to expose the combined sternothyrohyoideus, omohyoideus, and sternomandibularis muscles. A plane of dissection was established on the medial side of each sternomandibularis muscle and the ventral branch of the spinal accessory nerves was identified bilaterally. Contraction of the muscle and flexion of the atlanto-occipital joint when the nerve was grasped with forceps confirmed isolation of the nerve. An approximately 10-cm section of the nerve was removed using either an Nd:YAG or CO₂ laser. A 1000 μm diameter contact-tip fiber was used for the Nd:YAG laser set at 25 watts and at continuous pulse. The CO₂ laser was set at 14 watts, with a ceramic tip and a 0.8 mm spot size, using a defocused beam, also at continuous pulse. Following the neurectomies, a 34-cm section of the combined sternothyrohyoideus and omohyoideus muscles was transected at the point of the ends of the skin incision and removed using either an Nd:YAG or CO₂ laser. The Nd:YAG laser, using the same fiber type, was used at the same settings as for the nerve transection. The CO₂ laser was also used at the same settings, but the beam was positioned in focus. The sternothyrohyoideus muscles were transected at their insertion onto the thyroid cartilage laminae. Caudal transection of the omohyoideus muscles was performed in an oblique fashion deep to the jugular vein. A 1-inch-diameter Penrose drain was positioned in the subcutaneous space with the ends exteriorized through separate stab incisions rostral and caudal to the ends of the skin incision. The subcutaneous tissues and skin were closed in routine fashion. Closure was facilitated by having the patient’s head placed in slight flexion. Antibiotic therapy was maintained for a period 10 days post-op. The drain was removed 5 days post-op.

3. Results

There was 1 stallion, 5 geldings, and 8 mares representing two breeds, (11 Quarter Horses, 3 Thoroughbreds). The current or intended use for the horses was cutting or racing (Thoroughbreds). Long-term outcome was available for all horses (minimum 5 months). Surgery was performed using the Nd:YAG laser on 10 horses and the CO₂ laser was used on 4 horses. None (14/14) of the horses demonstrated cribbing behavior after surgery. All horses returned to previous function. No differences were noted in the overall post operative outcome with use of the Nd:YAG vs. the CO₂ laser.

4. Discussion

The success rate in surgically preventing cribbing in the horses with the method reported here was 100%. This is greater than previously reported in other studies. The CO₂ laser was used initially because of the unavailability of the CO₂ laser to the authors. No obvious differences in hemostasis were observed with the Nd:YAG vs. the CO₂ laser. More rostral transection of the sternothyrohyoideus and omohyoideus muscles may decrease the ability of a fibrous union forming between the transected muscle ends, which we believe is vital to increasing the success rate. Minimizing seroma or hematoma formation post-operatively may decrease fibrous tissue formation and also improve the success rate.

References and Footnote


*Latex Penrose drain, Sherwood Medical Co., St. Louis, MO 63103.