Himachal Journal of Agricultural Research 50(2): 315-318 (2024)

Short communication

Management of elongated soft palate by CO_2 laser in three pugs-case report

Sara Kaushal*, Adarsh Kumar, SP Tyagi, Rohit Kumar, Amit Kumar, Vishwatej Narute and Basava Gagan

Department of Veterinary Surgery and Radiology,

Dr. G.C. Negi College of Veterinary and Animal Sciences, CSK Himachal Pradesh Agriculture University, Palampur, H.P.

*Corresponding author: e-mail: sara96preyee@gmail.com

Manuscript received: 11.7.2024; Accepted: 24.7.2024

Abstract

Brachycephalic airway syndrome, common in brachycephalic dogs, includes elongated soft palate, stenotic nares, and everted laryngeal saccules. An elongated soft palate (ESP) occurs when the soft palate extends too far into the airway, obstructing airflow into the lungs. Three pugs were presented for ophthalmic procedures with a history of snoring and increased inspiratory effort. After a complete examination, it was diagnosed that the likely cause of snoring was an elongated soft palate. The condition was managed using a CO_2 laser which resulted in good post-operative recovery with no complications.

Keywords: Brachycephalic airway syndrome, carbon dioxide laser, elongated soft palate, resection

Brachycephalic airway syndrome otherwise known as BAS is a common condition affecting brachycephalic breed of dogs(Koch *et al.* 2003). Various primary and secondary abnormalities are associated with BAS. Primary abnormalities include stenotic nares, displaced turbinates, hypoplastic trachea and elongated soft palate whereas secondary abnormalities comprise everted laryngeal saccules and laryngeal collapse (Ginn *et al.* 2008; De Lorenzi *et al.* 2009; Meola 2013). According to Fossum (2019), elongated soft palate (ESP) is a prevalent condition where the soft palate extends excessively, causing its tip to intrude into the airway (by more than 1-3 mm beyond the tip of the epiglottis), thereby obstructing airflow into the lungs. ESP is the most common abnormality in BAS and over 80% of the dogs with elongated soft palates are brachycephalics (Harvey and Venker-van 1975). Clinical signs include snoring, gagging, coughing, exercise intolerance and inspiratory stridor (Orsher 1993). Treatment includes surgical management of the condition by resection of the elongated portion of the soft palate. If left untreated, may increase in severity and cause fatal airway obstruction (Harvey 1982).

The present case report highlights the management of elongated soft palate by CO_2 laser. Three male pugs were presented for ophthalmic procedures to the Department of Veterinary Surgery and Radiology each with a history of snoring and increased respiratory effort. A physical examination was performed and it was observed that snoring was likely due to elongated soft palates. A decision was taken to manage the condition using a carbon dioxide laser. The same carbon dioxide (CO_2) laser settings were used in all three cases. Surgical management of ESP was done under general anesthesia using Inj Butorphanol tartrate @ 0.2 mg/kg body weight I/M followed 15 minutes later by Inj. Atropine sulphate @ 0.02-0.04 mg/kg body weight I/M and after 10-15 minutes by Inj. Diazepam @ 0.5 mg/kg body weight I/V. Induction of anesthesia was done with Inj. Propofol I/V "till effect". The anesthesia was maintained using 2% Isoflurane with 100% oxygen.

Dogs were placed in lateral or dorsal recumbency with their mouths wide open and tongues extended forward to expose the entire oropharynx. The caudal tip of the soft palate was grasped with forceps and retracted ventrally. First, a visual assessment was conducted to estimate the amount of tissue to be removed, followed by marking with a 4-watt continuous mode setting of CO_2 laser. The laser handpiece was positioned close to the target site. The

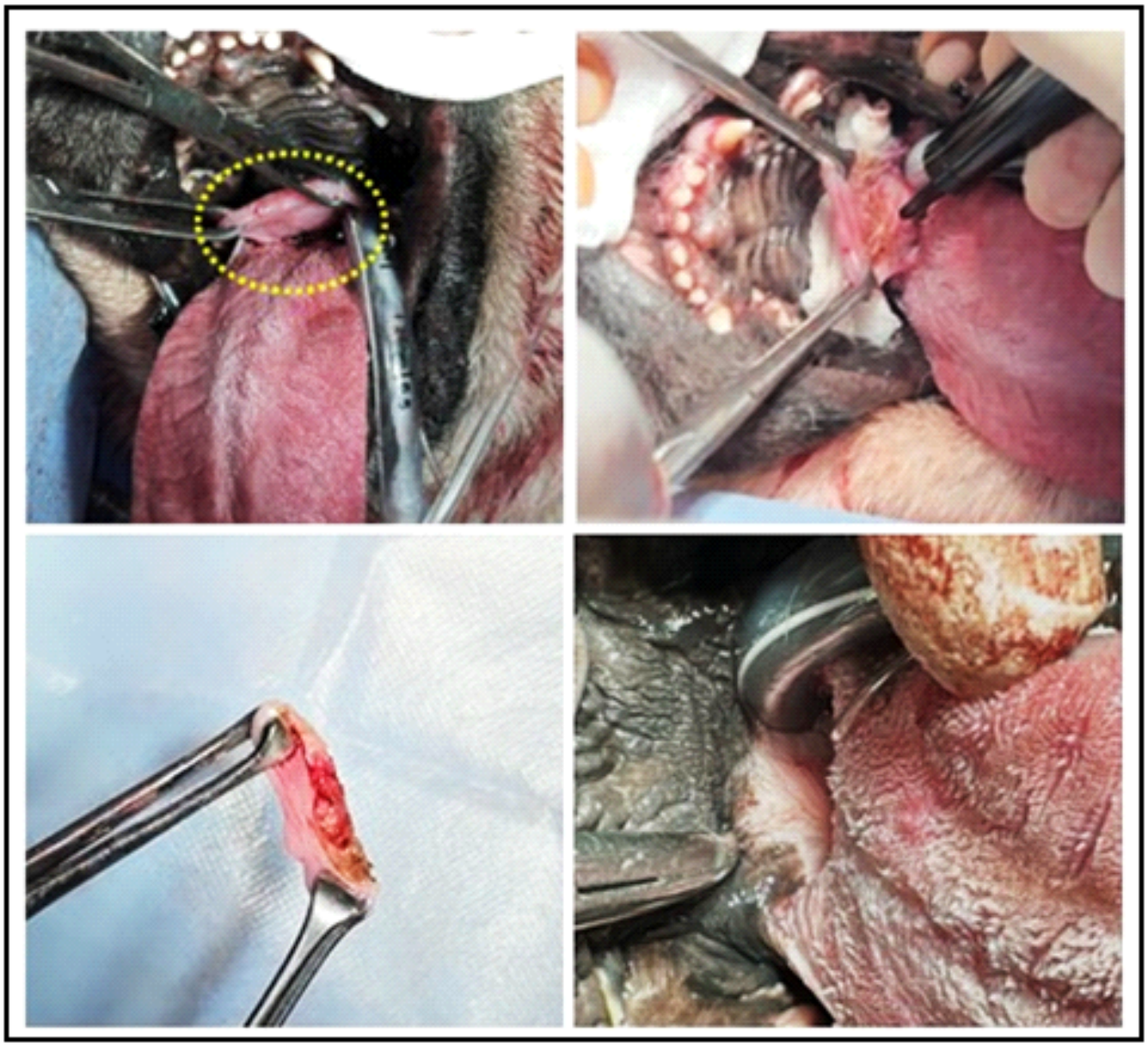

Fig. 1 Soft palate resection using carbon dioxide laser

CO_2 laser, set at 8 watts in continuous mode, was then used to make an incision along the marked line. Ventral traction was applied to create tension around the soft palate to be removed. The tissue was excised by cutting through the remaining tissue from one side to the other. Although suturing is generally not required or recommended, however, in this study, the nasopharyngeal mucosa was sutured to the oropharyngeal mucosa using a simple continuous pattern with 4-0 monofilament absorbable suture to prevent any complications. The animals were kept on antibiotics and anti-inflammatories for 5 days. None of the three cases had any post-operative bleeding and complications. It was observed that breathing was also noticeably improved after the surgery.

Elongated soft palate is a common condition of BAS in brachycephalies and can be effectively managed by surgical resection of the elongated portion of the soft palate. The main objective of the treatment is to minimize post-operative inflammation and post-operative oedema which can cause upper airway compromise (Dunié Mérigot *et al.* 2010). According to various studies, it has been confirmed that laser surgery offers a compelling alternative to other conventional methods in terms of tissue inflammation and post-operative complications (Mison *et al.* 2003; Berger and

Eeg 2006). According to Clark and Sinibaldi (1994), the use of CO_2 laser represents a new option for the management of elongated soft palate in brachycephalic breeds as this procedure allows for rapid, uncomplicated shortening of the soft palate with complete hemostasis. The use of CO_2 laser in continuous mode with 6-8 watts power settings is sufficient to resect the elongated soft palate efficiently as the laser offers advantages such as hemostasis due to sealing off the small blood vessels resulting in a clear, dry operative field. There is less tissue trauma and therefore fewer complications and usually no need for suturing (Davidson *et al.* 2001; Dunié Mérigot*et al.* 2010).

Therefore, it was concluded that the use of a CO_2 laser for the resection of an elongated soft palate is an effective alternative modality, which resulted in minimal intraoperative and post-operative bleeding with no complications observed postoperatively.

Conflict of interest: Authors declare no competing interest.

References

Berger N and Eeg PH 2006. Types of Laser-Tissue Interaction- Veterinary Laser Surgery. Blackwell, Iowa, USA, pp 29-42.

Clark GN and Sinibaldi KR 1994. Use of a carbon dioxide laser for treatment of elongated soft palate in dogs. Journal of the American Veterinary Medical Association **204 (11):** 1779-1781.

Davidson EB, Davis MS, Campbell GA, Williamson KK, Payton ME, Healey TS and Bartels KE 2001. Evaluation of carbon dioxide laser and conventional incisional techniques for resection of soft palates in brachycephalic dogs. Journal of the American Veterinary Medical Association **219 (6):** 776-81.

De Lorenzi D, Bertoncello D and Drigo M 2009. Bronchial abnormalities found in a consecutive series of 40 brachycephalic dogs. Journal of the American Veterinary Medical Association **235 (7):** 835-40.

Dunié Mérigot A, Bouvy B and Poncet C 2010. Comparative use of CO_2 laser, diode laser and monopolar electrocautery for resection of the soft palate in dogs with brachycephalic airway obstructive syndrome. Veterinary record **167 (18):** 700-4.

Fossum TW and MacPhail CM 2019. Surgery of the Integument system. In: Small animal surgery, eds Fossum TW. Elsevier Health Sciences, Philadelphia, PA, USA, pp 179-265

Ginn JA, Kumar MS, McKiernan BC and Powers BE 2008. Nasopharyngeal turbinates in brachycephalic dogs and cats. Journal of the American Animal Hospital Association **44 (5):** 243-9.

Harvey CE 1982. Upper Airway Obstruction Surgery: 2. Soft Palate Resection- Brachycephalic Dogs. Journal of the American Animal Hospital Association **18:** 538-544.

Harvey CE and Venker-Van Haagan A 1975. Surgical Management of Pharyngeal and LaryngealAirway Obstruction in the Dog. Veterinary clinics of North America **5:** 515.

Koch DA, Arnold S, Hubler M and Montavon PM 2003. Brachycephalic syndrome in dogs. Compendium on continuing education for the practising veterinarian-north americanedition **25 (1):** 48-55.

Meola SD 2013. Brachycephalic Airway Syndrome. Topics in Companion Animal Medicine **28 (3):** 91–96.

Mison MB, Steficek B, Lavagnino M, Teunissen BD, Hauptman JG and Walshaw R 2003. Comparison of the effects of the CO_2 surgical laser and conventional surgical techniques on healing and wound tensile strength of skin flaps in the Dog. Veterinary Surgery **32:** 153-160.

Orsher RJ 1993. Brachycephalic Airway Disease. In: Disease Mechanisms. In: Small Animal Surgery, eds Bojrab MJ. Lea & Febiger, Philadelphia, pp 369-370.