The Thai Journal of Veterinary Medicine

Volume 37
Issue 1 *March, 2007*

Article 7

3-1-2007

ECG Quiz

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Recommended Citation

Buranakarl, Chollada and Angkanaporn, Kris (2007) "ECG Quiz," *The Thai Journal of Veterinary Medicine*: Vol. 37: Iss. 1, Article 7.
DOI: https://doi.org/10.56808/2985-1130.2072
Available at: https://digital.car.chula.ac.th/tjvm/vol37/iss1/7

Short Communication

Congenital Oesophageal Stenosis in a Puppy

Churee Pramatwinai

Abstract

An extremely rare case of congenital oesophageal stenosis in a two-month-old, male, miniature pincher dog was reported. The puppy was presented at the Small Animal Teaching Hospital, Faculty of Veterinary Science, Chulalongkorn University, with a history of an acute onset of regurgitation at the time of weaning on to solid food. Contrast radiography of the oesophagus showed that the oesophagus at the cervical and thoracic-inlet portions was moderately dilated. Upon oesophagoscopic examination, the oesophageal lumen adjacent to the heart base showed intraluminal stenosis. The mucosa was normal and the stenotic opening was localized at the center of the lumen. Upon oesophagoscopy, the oesophageal stenosis was differentiated from a persistent right fourth aortic arch (PRAA) or vascular ring. Treatment was achieved by bougienage dilatation once after an hour of pre-dilatation administration of intravenous dexamethasone (1 mg/kg). Oral cefazollin (25 mg/kg), prednisone (1 mg/kg/day) and sucralfate (120 mg/kg/day) were given for two weeks after the dilatation. Pre- and post-operative administrations of steroids were beneficial to the successful treatment. After the treatment, the dog was able to swallow solid food and was doing well over a twelve-month follow up period.

Keywords : congenital oesophageal stenosis, puppy, oesophagoscopy, bougienage.

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Presented as Poster Session in 2003 WSAVA, Bangkok, Thailand.

บทคัดย่อ

ภาวะหลอดอาหารตีบโดยกำเนิดในลูกสุนัข

จุรี ปรมัตถ์วินัย

รายงานภาวะหลอดอาหารตีบโดยกำเนิดที่พบได้ยากมากในลูกสุนัขพันธุ์มิเนียเจอร์พินเชอร์ อายุประมาณ 2 เดือน ลูกสุนัขได้มารับการรักษาที่หน่วยศัลยกรรม โรงพยาบาลสัตว์เล็ก คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ด้วยประวัติมีอาการสำรอกฉับพลันเมื่อหย่านมและกินอาหารแข็ง การตรวจวินิจฉัยด้วยภาพถ่ายรังสีหลังป้อนสารทึบแสงของหลอดอาหาร พบว่าหลอดอาหารส่วนคอและส่วนทางเข้าช่องอกขยายใหญ่พอสมควร การส่องกล้องเอ็นโดสโคปตรวจหลอดอาหารพบว่าช่องว่างภายในหลอดอาหารใกล้กับฐานของหัวใจตีบแคบลง ลักษณะการตีบแคบนี้แตกต่างจากการตีบแคบ เนื่องจากภาวะเจริญผิดปกติเนื่องจากหลอดเลือดบีบรัดหลอดอาหาร (Persistent right fourth aortic arch, PRAA หรือ vascular ring) สุนัขได้รับการรักษาด้วยการถ่างหลอดอาหารโดยวิธีโบจีเนจ (bougienage) เพียง 1 ครั้ง โดยก่อนการถ่าง 1 ชม. สุนัขได้รับยาเดคซาเมทาโซน (1 มก./กก.) เข้าหลอดเลือดและภายหลังการถ่างกินยาปฏิชีวนะเซฟฟาโซลิน (25 มก./กก.) เพรดนิโซโลน (1 มก./กก.) และซูครอลเฟต (120 มก./กก./วัน) เป็นระยะเวลา 2 สัปดาห์ การให้สเตียรอยด์ ก่อนและหลังการถ่างเป็นประโยชน์ต่อการรักษา หลังการรักษาสุนัขสามารถกลืนอาหารแข็ง สุนัขมีสุขภาพแข็งแรงตลอดการติดตามผลการรักษานาน 12 เดือน

คำสำคัญ : หลอดอาหารตีบโดยกำเนิด ลูกสุนัข การส่องกล้องหลอดอาหาร โบจีเนจ

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ได้เสนอโปสเตอร์ ในงานประชุมวิชาการ WSAVA 2003 กรุงเทพฯ ประเทศไทย

Introduction

Congenital stenosis of the oesophagus is a luminal narrowing and functional obstruction of the oesophagus and is considered to be extremely rare both in dogs (Pande et al., 1995) and in humans (Pelot, 1995). There are very few reports involving congenital oesophageal stenosis in veterinary publications. A congenital anomaly of the tracheoesophageal fistula is much less common (Lichtenstein, 1995; Pope, 1993[a]). This results from an improper separation of the caudal portion of the laryngotracheal groove from the foregut. It is often associated with stenosis or atresia of the oesophagus (Noden and De Lahunta, 1985). Several types of congenital stenosis of the oesophagus have been described in human medicine. A stenotic zone that contains cartilage and mucus glands has been found in both infants and adults, and usually requires a resection rather than dilatation. Stenosis can also be caused by muscle abnormalities (Pope, 1993[a]). In addition, oesophageal webs and rings are typically considered congenital in humans. Oesophageal webs are thin structures consisting of squamous epithelium and submucosa. They may be concentric or eccentric and single or multiple. Oesophageal rings are lumen-narrowing structures consisting of mucosa, submucosa and muscle and are typically accompanied by hiatal hernias (Lichtenstein, 1995; Pope, 1993[b]). The purpose of this publication is to report a rare congenital form of a partial oesophageal obstruction, its diagnosis and successful treatment in a puppy.

Materials and Methods

Case History

A two-month-old, male, Miniature Pincher puppy was referred to the Small Animal Teaching Hospital, Chulalongkorn University with a history of acute-onset regurgitation at the time of weaning on to solid food. The animal's parents and four other littermates were normal. There was no history of the ingestion of any foreign bodies, corrosive chemicals or medicines prior to the

clinical signs. Survey and contrast radiography of the oesophagus performed four days after the signs of regurgitation revealed a moderate retention of barium from the cervical to the thoracic-inlet part of oesophagus (Fig.1). Upon presentation, the puppy appeared thin and pale, but otherwise normal.

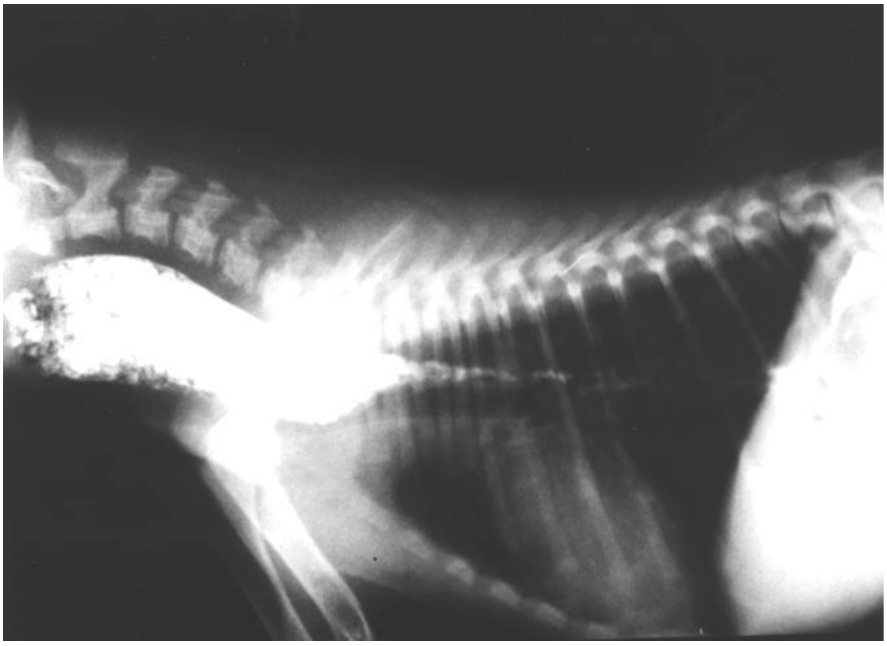

Figure 1 Contrast radiography of the lateral thorax showing a moderate retention of barium in the cervical and thoracic inlet part of oesophagus.

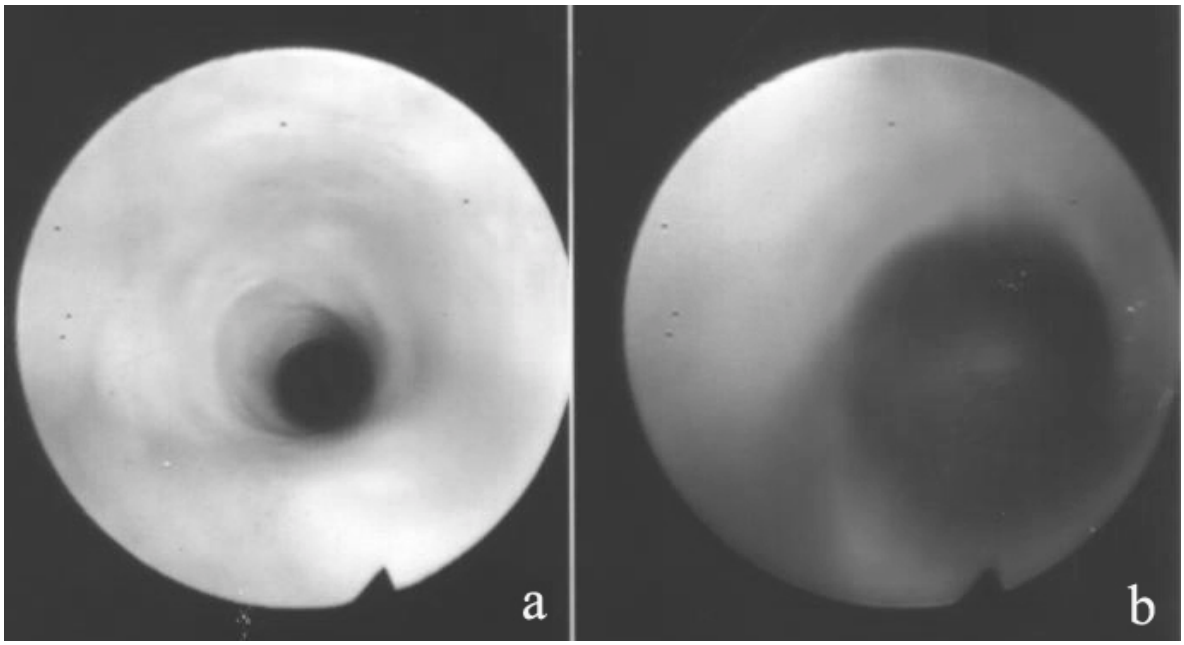

Figure 2 An endoscopic view of the stenotic oesophagus showing a narrowed lumen and smooth mucosa (a). Following bougienage dilatation using 12- and 15- mm Salvary Gillard dilators, the oesophagel lumen was visibly enlarged (b).

Oesophagoscopic Examination

Oesophagoscopy was performed under a general anesthesia. Congenital oesophageal stenosis was diagnosed which was characterized by an intraluminal stenosis with a diameter of about 8 mm, adjacent to the heart base and normal mucosa (Fig.2a). The endoscope was unable to further advance caudally beyond the stenotic area. The puppy was supportively treated until the anemic condition became normal before performing endoscopic oesophageal dilatation.

Treatment

Dexamethasone, 1 mg/kg of body weight, was intravenously administered to the puppy one hour before the general anesthesia. The puppy was premedicated with atropine sulphate (0.04 mg/kg, IM), and anesthetized with thiopental sodium (20 mg/kg, IV) and the anesthesia was maintained with halothane in oxygen. The puppy was placed in a left lateral recumbent position. Bougienage dilatation was performed using a 12 mm and 15 mm diameters, Salvary Gillard dilators (Cook company). A wire guide was passed through the biopsy channel of an endoscope (Olympus GIF type P20) and was visually inserted into the narrowed oesophageal lumen. The wire guide was left in its place while the endoscope was carefully withdrawn. The initial dilatation was performed using a 12-mm bougie. It was inserted into the lumen of the stenotic oesophagus by putting the bougie through the wire guide. After 60 seconds, the bougie and the wire guide were simultaneously removed. The process was immediately repeated using a 15-mm bougie. After dilatation, the mucosa at the stenotic site was examined for any complications (Fig. 2b). The endoscope was advanced caudally to examine the dilated area, the post-stenotic oesophagus and the stomach, all of which exhibited normal findings.

During the first post-operative week, the dog was fed with milk and liquid food for the first two days, semisolid food for the next few days and small pieces of solid food thereafter. Oral cefazollin (25 mg/kg), prednisone (1 mg/kg/day) and sucralfate (120 mg/kg/day) were given for 2 weeks post-dilatation.

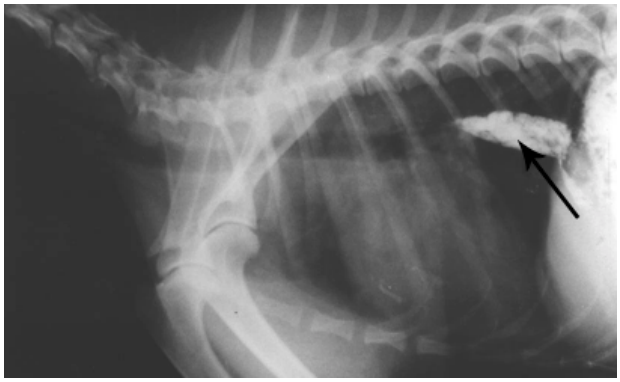

Figure 3 Contrast radiography of the oesophagus 12 months after treatment, the oesophageal dilatation has disappeared. Small amounts of barium remained in the distal oesophagus (arrow) but most barium passed to the stomach.

Results and Discussion

The puppy was much improved two weeks post-operatively. He was able to eat rice mixed with small pieces of meat without regurgitation. He also appeared alert, healthy and regained his body weight over the follow-up period. The owner brought the puppy back after12 months for a recheck and a contrast radiography of the oesophagus immediately after a barium meal showed no evidence of cervical oesophageal dilatation. Most of the barium had passed into the stomach except for a small amount which remained in the distal oesophagus (Fig. 3). Congenital oesophageal stenosis is considered to be extremely rare in dogs (Pande et al., 1995) and in humans (Pelot, 1995). Only a few cases have been reported in veterinary medical literature, which is probably due to a lack of awareness of the anomaly. The congenital oesophageal development of canine embryos is comparable to that of humans. During the early stages of fetal development, the oesophageal lumen may become narrowed, causing oesophageal stenosis. Stenosis usually occurs in the lower third and may be caused by incomplete recanalization, vascular abnormalities or accidents that

compromise the blood flow. (Pelot, 1995; Sadler, 1995) In humans, several types of congenital oesophageal stenosis have been described (Pope, 1993a). In this case, it was uncertain whether or not oesophageal webs or rings were the abnormality since there was no evidence of any thin membrane upon oesophagoscopy and a biopsy was not performed. However, the author hypothesizes that the puppy had a maldevelopment of the oesophageal muscle that subsequently caused congenital oesophageal stenosis. A differential diagnosis between congenital oesophageal stenosis and a persistent right fourth aortic arch (PRAA) was made, based on the history of an acute onset of regurgitation at the time of weaning on to solid foods. In this case the oesophagoscopic revealed intraluminal stenosis of the oesophagus which confirmed the diagnosis. A dog affected with a PRAA would show extraluminal oesophageal stenosis. (MacPhail et al., 2001) In addition, the oesophageal mucosa at the stenotic site was normal and the stenotic opening was at the center of the esophageal lumen, which is similar to that described in human literature (Pelot, 1995). Reflux oesophagitis, mucosal trauma caused by foreign impaction, corrosive chemicals and irritant drug administration were excluded, as there was no evidence of reflux oesophagitis or historical indications.

Oesophageal dilatation for the correction of congenital stenosis of the oesophagus in humans is successfully performed using either a balloon catheter or a bougienage, whereas, oesophageal stenosis originating from a tracheobronchial remnant should be corrected by surgical resection (Neilson et al., 1991; Pope, 1993a; Feng and Kong, 1999). In this case, the puppy was successfully treated by a bougienage dilatation. The combination of the preoperative intravenous administration of dexamethasone (1 mg/kg body weight) and post-operative oral administration of prednisolone (1 mg/kg body weight daily) for two weeks, provided a more effective anti-inflammatory effect on the oesophagus than giving post-dilatation oral prednisolone only. The glucocorticoid potency of dexamethasone is approximately seven times greater than that of prednisolone or prednisone (Ferguson and Hoenig, 1995). A surgical procedure performing two longitudinal myotomies and submucosal incisions over the stricture on opposite sides of the oesophagus, and suturing the incisions transversely, has been used successfully to correct a congenital oesophageal stricture in a pony foal (Stewart and Reinertson, 1983).

In conclusion, congenital oesophageal stenosis is extremely rare in dogs. It is possible to differentiate it from PRAA using oesophagoscopy. The cause of congenital oesophageal stenosis in this case was likely to be due to a maldevelopment of the oesophageal muscle. In this case the puppy was successfully treated by a bougienage dilatation. The combination of pre-and post-dilatation steroid therapy contributed to the successful treatment.

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