

Suspected Anesthesia Associated Esophageal Stricture Formation in a Cat

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ABSTRACT

The case of esophageal stricture of a one-year-old queen that occurred after three anesthesia applications (one for ovariohysterectomy and the others for incisional wound complications) in two weeks was presented. Barium contrast esophagography provided the diagnosis of esophageal stricture located at the distal of thoracic esophagus, at the level of intercostal distance of 9-10 in mediastinum caudale. Feeding with canned food placed on a higher surface was recommended in order to prevent regurgitation and it was observed that regurgitation recovered in three days. Contrast radiography taken a month and a year later showed that location diagnosed as stricture was anatomically normal. In conclusion, repeated anesthesia performed with xylazine HCl and ketamine HCl in two weeks may contribute in developing esophageal stricture in cats and feeding with soft food from a higher surface may be preferred before any surgical treatment.

Key Words: Anesthesia, cat, esophageal stricture, reflux esophagitis

ÖZET

BİR KEDİDE ANESTEZİYE BAĞLI ÖZEFAGEAL STRİKTÜR

Bu olgu sunumunda ovariohisterektomi yapılan ve izleyen iki hafta içerisinde iki kez daha anesteziye alınan bir yaşlı dişi kedide oluşan özefageal striktür açıklanmaktadır. Baryum kontrast özefagografide torasik özefagusun distalinde, mediastinum caudale'de 9-10. interkostal aralık düzeyinde özefageal striktür tespit edildi. Regurgitasyonu önlemek amacıyla hastanın yüksek bir zemin üzerine konan yumuşak gıdalarla beslenmesi önerildi. Bu uygulamayla üç gün içerisinde regurgitasyonun sona erdiği tespit edildi. Bir ay ve bir yıl sonra kontrol amaçlı alınan kontrast radyografide striktür tanısı konan bölgede anatomik yapının normal olduğu saptandı. Sonuç olarak, kedilerde iki hafta içinde tekrarlanan ksilazin ve ketamin HCl anesteziyi özefageal striktür oluşumuna neden olabilir ve herhangi bir şirürjikal tedaviye başvurmadan önce yüksek zemin üzerinde yumuşak gıdalarla besleme ile iyileşebilir.

Anahtar Kelimeler: Anestezi, kedi, özefageal striktür, reflüks ezofagit

Introduction

Esophageal strictures are uncommon occasions in small animals and the main cause is reflux esophagitis secondary to anesthesia though it can also occur after mucosal damage like esophageal foreign body, esophageal surgery and lesions due to caustic substances (Leib et al., 2001; Adamama-Moratiou et al., 2002). Studies showed that the most common cause of esophagitis is anesthesia induced gastroesophageal reflux (GER) (Wilson and Walshaw, 2004). Certain anesthetic drugs such as atropine, xylazine, acepromazine (Strombeck and Harrold, 1985) diazepam (Galatos and Raptopoulos, 1995a), morphine, halothane and isoflurane are known to decrease the lower esophageal sphincter tone and increase the incidence of reflux (Epstein and Swirsky, 2009). Acid containing refluxed gastric content may lead to esophageal damage and esophagitis (Han, 2003). Esophageal strictures can be divided into two categories as benign and malignant strictures. Benign strictures usually occur due to narrowing of esophageal lumen as a result of fibrous tissue formation in esophageal mucosa in the presence of esophagitis (Glazer and Walters, 2008). Prolonged preoperative fasting (Galatos and Raptopoulos, 1995a) and intraabdominal operations were reported to increase esophageal reflux (Galatos and Raptopoulos, 1995b). On the other hand, body positioning and tilting the surgical table were not found to be significant. In addition, the incidence of GER is higher during abdominal surgery than the other procedures and the most common procedure related with increased reflux is ovariohysterectomy (Galatos and Raptopoulos, 1995b). Similarly, Adamama-Moraiou et al. (2002) stated that ovariohysterectomy is a risk factor for developing benign esophageal stricture in females. Clinical signs of esophagitis may include anorexia, ptyalism, dysphagia, regurgitation, vomiting, retching, gagging, coughing and refusal to eat depending on the severity of the disease (Han, 2003). Structural abnormalities of esophagus such as strictures (Han, 2003) and vascular ring anomalies (Yarim et al, 1999) may be

diagnosed by contrast radiography and endoscopy. Treatment choices of strictures are dilation techniques including bougienage and balloon dilations (Wo and Waring, 1997) that can be repeated until an adequate diameter is obtained (Leib et al, 2001). Mild esophageal strictures sometimes may be treated with a soft diet from a higher surface alone (Glazer and Walters, 2008). In this case report, esophageal stricture of a year old queen that was occurred after ovariohysterectomy due to dystocia performed under general anesthesia (xylazine HCl 2 mg/kg, ketamine HCl 10 mg/kg) and two more anesthesia application in following two weeks is presented.

Case

A year old tortoise-shell female cat weighing 1.5 kg underwent en-bloc lateral ovariohysterectomy due to dystocia at a private veterinary clinic three weeks ago before coming our clinic. Six days after the first operation, the cat underwent another operation at the same clinic upon the opening of incision line and the muscles. Both operations had been performed under general anesthesia. For premedication, xylazine HCl at a dose rate of 2 mg/kg and for induction, ketamine HCl at a dose rate of 10 mg/kg were injected intramuscularly. Five days after the second operation, the cat was referred to the clinics of Faculty of Veterinary Medicine with the history of opening of incision line and eventration of omentum and spleen. The cat was premedicated with xylazine HCl (2 mg/kg) and induced with ketamine HCl (10 mg/kg), then the muscles (chrome catgut, usp 2/0) and the skin were sutured (silk, usp 2/0) after the omentum and the spleen were placed to their anatomical locations. Operation was not carried out with the head-down position. During the operation, suppuration or adhesion in the abdominal cavity and infection at the incision line were not observed. Duration of the surgery was less than an hour and anesthesia was uneventful. The cat hospitalized for 24 hours and then sent home. Amoxycillin + clavulanic acid was prescribed for five days postoperatively.

At postoperative day four following the third operation, she was brought with the complaint of vomiting and weight loss. Serum urea and creatinine concentrations were detected to be 2.2 mg/dl and 0.49 mg/dl, respectively and ultrasonographic examination (B-mode real time, 5 MHz) showed that the kidneys had no pathological condition. The cat received Ringer lactate solution i.v., 0.5 mg/kg metoclopramide HCl i.v. and 2 mg/kg ranitidine HCl for two days on suspicion of acute gastritis but did not recover. After hospitalization it was detected that the cat had regurgitation rather than vomiting. Plain radiography did not give enough knowledge; but barium contrast esophagography (7 ml/kg orally) provided the diagnosis of esophageal stricture located at the distal of thoracic esophagus, at the level of intercostal distance of 9-10 in mediastinum caudale (Figure 1). Considering that the cat underwent three operations in two weeks and was in poor condition, it was fed with canned food placed on a higher surface in order to prevent regurgitation before an attempt to perform dilation procedure. It was observed that regurgitation was ended in three days after starting to eat on a high surface. Contrast radiographies taken a month and a year later showed that location diagnosed as stricture was anatomically normal (Figure 2 and Figure 3). One year later her body weight was 2.6 kg.



Figure 1. Laterolateral contrast radiographic appearance of esophageal stricture. The arrows show the location of stricture.

Şekil 1. Özefageal striktürün laterolateral kontrast radyografik görüntüsü. Oklar striktürün konumunu göstermektedir.



Figure 2. Contrast radiographic appearance of esophagus taken a month later.

Şekil 2. Bir ay sonra çekilen kontrast radyografik özefagus görüntüsü.



Figure 3. Contrast radiographic appearance of esophagus taken a year later.

Şekil 3. Bir yıl sonra çekilen kontrast radyografik özefagus görüntüsü.

Discussion and Conclusion

The most common cause of esophageal stricture is anesthesia-related reflux and females particularly are at risk because of ovariectomy. The other risk factors for esophageal stricture are pre-anesthetic and induction agents that reduce lower esophageal sphincter pressure, therefore predisposing the animal to gastroesophageal reflux (Adamama-Moratiou et al, 2002). Besides, pregnancy is known to decrease lower esophageal sphincter pressure and increase the possibility of reflux in the human (Ramu et al, 2010). The fact that the cat was anaesthetized with xylazine HCl and ketamine HCl for three times in two weeks, had en-bloc ovariectomy due to dystocia and pregnancy period might be contributed in developing esophageal stricture. Prolonged

preoperative fasting was also determined to be related with increased gastric acidity and occurrence of reflux in dogs (Galatos and Raptopoulos, 1997; Han, 2003). Similarly, Epstein and Swirsky (2009) stated that preoperative fasting should not be longer than 10 hours or shorter than five hours. The cat in our case had a history of fasting time more than 12 hours before the third surgery. Adamama-Moraitou et al. (2002) indicated that the strictures were located at the distal part of the thoracic esophagus in the animals underwent obstetric surgery. Similarly esophageal stricture located at the distal of thoracic esophagus in the present case. Diagnostic evaluation of esophageal diseases consists of chemistry profile, radiographs and endoscopy. Plain radiography is an important way to determine the causes of esophagitis such as hernias, tumors, foreign bodies, megaesophagus or vascular ring anomalies (Han, 2003). In this report, plain radiography did not reveal foreign body or any other esophageal disease; but barium contrast esophagography revealed an esophageal stricture. Esophageal strictures are generally treated by dilation procedures including bougienage and balloon dilation techniques. On the other hand, mild strictures may be treated with a soft diet and elevated feeding alone (Glazer and Walters, 2008). In our case feeding the cat with canned food placed on a higher surface was preferred as her condition was not good enough for dilation procedure which requires anesthesia. Three days later regurgitation disappeared and the cat determined to gain weight a month later. Importance of feeding soft food from a higher position for a cat with esophageal stricture even in the treatment with a self-expanding stent was also pointed out by Glanemann et al. (2008). The cat was treated with metoclopramide HCl and ranitidine HCl for two days on suspicion of acute gastritis before the diagnosis of stricture. Prokinetic agents such as metoclopramide may be beneficial to decrease the frequency of reflux by increasing lower esophageal sphincter tone and gastric motility. Since the lower esophageal muscle in cats is composed of smooth muscle, these agents may also be valuable in stimulating

esophageal motility in cats (Han, 2003). Therefore it was thought that using metoclopramide for two days before feeding the cat with soft diet from a higher surface might be contributed in the recovery.

In conclusion, anesthesia with xylazine HCl and ketamine HCl performed three times in two weeks may lead to formation of esophageal stricture particularly following obstetric surgery in a pregnant cat and feeding with soft food from a higher surface may be preferred before any surgical treatment.

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