



Case Report

## Anesthesia-induced severe esophagitis in a cat

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### Abstract

This case report describes the development of severe esophagitis after an anesthesia event for a shaving procedure in a seven years old male cat. The cat was brought to our animal clinic with a complaint of severe vomiting and appetite loss. It was reported that vomiting has started after the administration of xylazine-ketamine anesthesia for the shaving procedure. In the endoscopic examination, severe esophagitis has been detected. Within two weeks, esophagitis was complicated with megaesophagus and then severe weight loss had been observed. Post-treatment endoscopic examination couldn't be performed because the esophagitis had developed after anesthesia. Regardless of whether a surgical procedure has been performed or the anesthesia has been performed repeatedly or once, post-anesthesia reflux esophagitis should also be suspected in cases of persistent appetite loss or dysphagia and vomiting after anesthesia.

**Keywords:** Esophagitis, Cats, Megaesophagus, Endoscopy, Reflux esophagitis

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### Introduction

Although esophagitis can occur due to many conditions, severe esophagitis after short-term anesthesia is very rare in cats. According to reported cases and studies, post-anesthetic reflux esophagitis is mostly related to long-term applications of anesthesia (Galatos et al., 2001; Wilson and Walshaw, 2004; Adami et al., 2011; Gültiken et al., 2014). Sideri et al. (2009), stated that usage of laryngeal air masks during anesthesia can increase reflux esophagitis risk. It's known that a series of mechanisms play a role in the pathogenesis of post-anesthetic reflux esophagitis and the incidence increases with age (Galatos and Raptopoulos, 1995a,b; Galatos et al., 2001; Garcia et al., 2017). To the author's knowledge, severe esophagitis following one-time anesthesia without a surgical procedure has never been reported in cats (Han, 2003; Wilson and Walshaw, 2004; Adami et al., 2011; Gültiken et al., 2014). This case report describes the development of severe esophagitis after anesthesia for a shaving procedure in a cat.

### Case history

A 7-year-old male cat was brought to the animal clinic at the Faculty of Veterinary Medicine of Istanbul

University-Cerrahpasa with complaints of vomiting and appetite loss. It was reported that vomiting had started after administration of xylazine-ketamine for the shaving procedure and 12 hours of fasting were applied before anesthesia. Clinical examination revealed weight loss and dehydration. Complete blood count and biochemical blood analysis results were within normal ranges consisting of red blood cells:  $10.5 \times 10^6/\mu\text{l}$ , hemoglobin: 14.6 g/dl, hematocrit: 47%, white blood cells:  $11.9 \times 10^3/\mu\text{l}$ , Platelet:  $541 \times 10^3/\mu\text{l}$ , mean corpuscular volume: 45 fL, mean corpuscular hemoglobin: 14 pg, mean corpuscular hemoglobin concentration: 31%, glucose: 157 mg/dl, blood urea nitrogen: 40 mg/dl, creatinine: 1.5 mg/dl, aspartate transaminase: 18 IU/L, alanine aminotransferase: 35 IU/L, alkaline phosphatase: 24 IU/L, gamma-glutamyl transpeptidase: 1 IU/L, cholesterol: 152 mg/dl. Thyroid results were within normal ranges and the acetylcholine receptor antibody test was negative. Additionally, the cat tested positive for antinuclear antibody (ANA).

After these examinations, an endoscopy was performed. Severe esophagitis with erosive and ulcerative lesions was detected (Figure 1). Standard symptomatic treatment consisted of famotidine 1 mg/kg, twice a day (Sandoz Ilac Sanayii, Kocaeli, Turkey) and metoclo-



**Figure 1:** Endoscopic image of severe esophagitis and widespread lesions in the esophagus of the cat.

pramide 0.2 mg/kg, twice a day (Mefar Ilac Sanayii, Istanbul, Turkey). Within two weeks, esophagitis was complicated with megaesophagus. By radiography, complete dilation of the esophagus (Megaesophagus) and gastrointestinal tract dilation due to gas formation has been observed (Figure 2).

Treatment consisted of neostigmine methylsulfate at a dose of 0.04 mg/kg, intramuscularly (IM), QID (Turktipsan, Ankara, Turkey), prednisolone 2 mg/kg, IM, SID (Mustafa Nevzat Ilac Sanayii, Istanbul, Turkey), metoclopramide 0.2 mg/kg, IM, QID (Mefar Ilac Sanayii, Istanbul, Turkey), sucralfate 0.25 g/kg, per os (PO), TID (Bilim Ilac Sanayii, Kocaeli, Turkey), famotidine 1 mg/kg, PO, BID (Sandoz Ilac Sanayii, Kocaeli, Turkey), N-butylbromide 2 mg/kg, IM, SID (Mefar Ilac Sanayii, Istanbul, Turkey), chlorpromazine 1 mg/kg, intravenously (IV), SID (Sanofi İlaç Sanayii, Kırklareli, Turkey), clindamycin 12.5 mg/kg, IM, BID (İ.E. Ulagay İlaç Sanayii, Istanbul, Turkey), vitamin B complex (Farmalac İlaç Sanayii, Istanbul, Turkey) and vitamin K (Proveta veteriner Urunleri, Ankara, Turkey) parenteral nutrition by Clinoleic® 20% 20 mL daily, IV, during 10 hours, in 80 mL of 5% dextrose (Eczacıbaşı-Baxter İlaç, Istanbul, Turkey) and Freamine® 8.5% 40 mL daily, IV, for 10 hours, in 80 mL of 5% dextrose. The cat was fed through the foley catheter. After the removal of the foley catheter, the diet was changed to wet food.

Since the esophagitis developed after anesthesia, post-treatment endoscopic examination could not be performed. The patient had lost approximately 3.5 kg before the treatment started and gained 500 grams in the first week of this therapy. It is presumed that parenteral nutrition has a great role in rapid recovery.

## Discussion

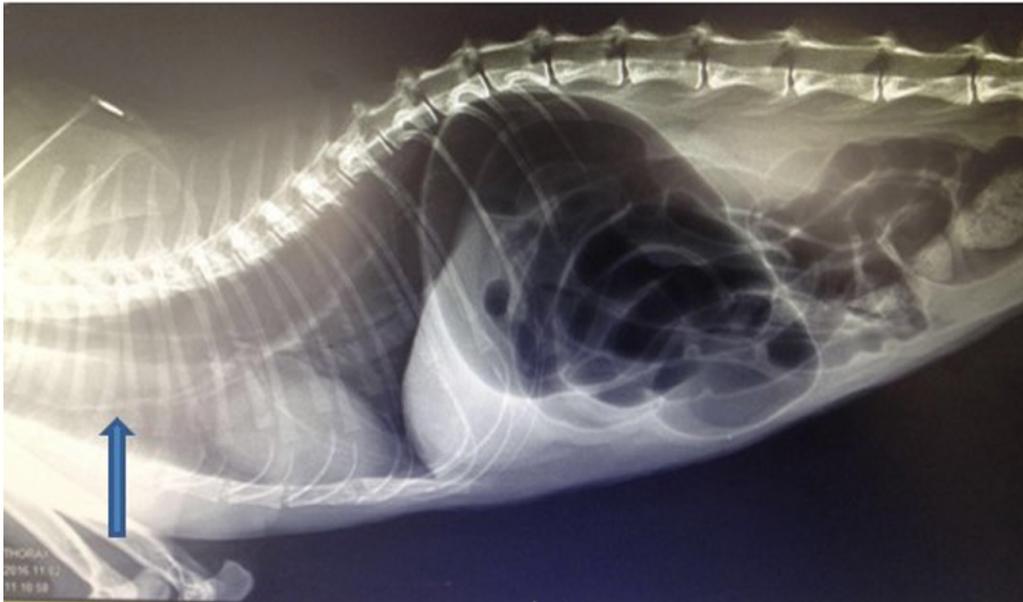
Post-anesthetic gastroesophageal reflux is mostly related to long-lasting surgeries. It is known that ab-

dominal surgical procedures decrease lower esophageal sphincter pressure and lead to gastroesophageal reflux. Also, consecutive anesthesia episodes in a short period can increase the risk (Han et al., 2003; Wilson and Walshaw, 2004; Adami et al., 2011; Gültiken et al., 2014). In this case report, the cat had not undergone any surgical intervention, there was no factor to increase abdominal pressure.

Fasting time is an important factor in the development of post-anesthetic gastroesophageal reflux. Studies showed that a prolonged fasting period influences gastric pH and incidence of reflux (Galatos and Raptopoulos, 1995a,b). Savas and Raptopoulos (2000), stated that withholding food for three hours before anesthesia does not have a significant influence on gastric volume but significantly decreases hydrogen ion concentration when compared to 10 hours of fasting. In our case, 12 hours of withholding food might have triggered gastroesophageal reflux.

Decreased pH of gastric contents reduces lower esophageal sphincter pressure and can lead to gastroesophageal reflux. Also, increased acidity of gastric fluid can cause more severe lesions on the esophagus during reflux (Galatos and Raptopoulos, 1995b; Wilson and Walshaw, 2004). It is also known that xylazine HCl reduces lower esophageal sphincter pressure (Strombeck and Harrold, 1985; Ho et al., 2001). Ho et al. (2001), determined that dexamethasone can reduce the regurgitation effect of xylazine HCl when it is applied at a dose of 4–8 mg/kg, 1 hour before xylazine HCl application. Garcia et al. (2017), showed that two doses of omeprazole 18–24 hours and 4 hours before the anesthesia at a dose of 1.45 – 2.20 mg/kg is associated with a significant increase in gastric and esophageal pH. In this case, no pre-medication was administered before anesthesia.

Body position during anesthesia affects the development of gastroesophageal reflux. The head-down po-



**Figure 2:** Megaesophagus and gastrointestinal tract dilation due to gas formation in X-ray showing esophageal dilation (arrow).

sition may lead to the accumulation of gastric fluid on more cranial portions of the esophagus [Galatos and Raptopoulos \(1995a\)](#). Position changes during the shaving process might have caused the effect of reflux on the esophagus to be more extensive in our case. Eosinophilic esophagitis is a complex condition with symptoms that are similar to gastroesophageal reflux and it is unresponsive to anti-reflux medicines [Fogg et al. \(2003\)](#). In our case, the ANA test was positive. Although esophagitis has developed after an anesthesia event, there might be a predisposition to esophagitis because of the autoimmune background of the cat.

The endoscopic examination should be performed to diagnose esophagitis and evaluate the severity of lesions in the esophagus. Lesions range in severity from mild esophagitis to strictures or perforation and the treatment route must be evaluated according to the severity [Han et al. \(2003\)](#); [Adami et al. \(2011\)](#). Mild to moderate lesions can be treated with H2-antagonists and prokinetics but in severe cases, it might be inadequate [Han \(2003\)](#); [Trepanier \(2010\)](#). In our case, there was no stricture or rupture in the esophagus and therefore no interventional treatment such as balloon dilation or surgical treatment was necessary. More aggressive treatment was needed as the patient worsened after medical treatment with only ranitidine and metoclopramide. A Foley catheter was required to prevent contamination of esophageal mucosa until the lesions were being epithelized and the motility of the esophagus was ensured.

## Conclusion

In our opinion, factors such as position changes during the shaving process, negative effects of anesthetic agents, prolonged fasting times, and individual predisposition factors have contributed to post-anesthetic gastroesophageal reflux esophagitis. Regardless of

whether a surgical procedure has been performed or whether the anesthesia is performed repeatedly or once, post-anesthesia reflux esophagitis should also be assessed in cases of lasting appetite loss and vomiting after anesthesia. Although the treatment of this condition is long-term and difficult to manage, remarkable results can be obtained.

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## Article Information

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## References

- Adami, C., Di Palma, S., Gendron, K., Sigrist, N., 2011. Severe esophageal injuries occurring after general anesthesia in two cats: Case report and literature review. *Journal of the American Animal Hospital Association* 47, 436–442. [10.5326/JAAHA-MS-5690](#).
- Fogg, M.I., Ruchelli, E., Spergel, J.M., 2003. Pollen and eosinophilic esophagitis. *The Journal of Allergy and Clinical Immunology* 112, 796–797. [10.1016/S0091-6749\(03\)01715-9](#).
- Galatos, A.D., Raptopoulos, D., 1995a. Gastro-oesophageal reflux during anaesthesia in the dog: The effect of age, positioning and type of surgical procedure. *The Veterinary Record* 137, 513–516. [10.1136/vr.137.20.513](#).
- Galatos, A.D., Raptopoulos, D., 1995b. Gastro-oesophageal reflux during anaesthesia in the dog: The effect of preoperative fasting and premedication. *The Veterinary Record* 137, 479–483. [10.1136/vr.137.19.479](#).
- Galatos, A.D., Savas, I., Prassinis, N.N., Raptopoulos, D., 2001. Gastro-oesophageal reflux during thiopentone or propofol anaesthesia in the cat. *Journal of Veterinary Medicine. Series A* 48, 287–294. [10.1046/j.1439-0442.2001.00357.x](#).
- Garcia, R.S., Belafsky, P.C., Della Maggiore, A., Osborn, J.M., Pypendop, B.H., Pierce, T., Walker, V.J., Fulton, A., Marks,

- S.L., 2017. Prevalence of gastroesophageal reflux in cats during anesthesia and effect of omeprazole on gastric pH. *Journal of Veterinary Internal Medicine* 31, 734–742. [10.1111/jvim.14704](https://doi.org/10.1111/jvim.14704).
- Gültiken, N., Pekmezci, D., Ay, S.S., Koldaş, E., Gram, A., 2014. Suspected anesthesia associated esophageal stricture formation in a cat. *Journal of the Faculty of Veterinary Medicine Istanbul University* 40, 70–274. [10.13140/2.1.1984.3200](https://doi.org/10.13140/2.1.1984.3200).
- Han, E., 2003. Diagnosis and management of reflux esophagitis. *Clinical Techniques in Small Animal Practice* 18, 231–238. [10.1016/S1096-2867\(03\)00051-3](https://doi.org/10.1016/S1096-2867(03)00051-3).
- Han, E., Broussard, J., Baer, K.E., 2003. Feline esophagitis secondary to gastroesophageal reflux disease: Clinical signs and radiographic, endoscopic, and histopathological findings. *Journal of the American Animal Hospital Association* 39, 161–167. [10.5326/0390161](https://doi.org/10.5326/0390161).
- Ho, C.M., Ho, S.T., Wang, J.J., Lee, T.Y., Chai, C.Y., 2001. Effects of dexamethasone on emesis in cats sedated with xylazine hydrochloride. *American Journal of Veterinary Research* 62, 1218–1221. [10.2460/ajvr.2001.62.1218](https://doi.org/10.2460/ajvr.2001.62.1218).
- Savas, I., Raptopoulos, D., 2000. Incidence of gastro-oesophageal reflux during anaesthesia, following two different fasting times in dogs. *Veterinary Anaesthesia and Analgesia* 27, 59–60. [10.1046/j.1467-2995.2000.00008-11.x](https://doi.org/10.1046/j.1467-2995.2000.00008-11.x).
- Sideri, A.I., Galatos, A.D., Kazakos, G.M., Gouletsou, P.G., 2009. Gastro-oesophageal reflux during anaesthesia in the kitten: Comparison between use of a laryngeal mask airway or an endotracheal tube. *Veterinary anaesthesia and analgesia* 36, 547–554. [10.1111/j.1467-2995.2009.00499.x](https://doi.org/10.1111/j.1467-2995.2009.00499.x).
- Strombeck, D.R., Harrold, D., 1985. Effects of atropine, acepromazine, meperidine, and xylazine on gastroesophageal sphincter pressure in the dog. *American Journal of Veterinary Research* 46, 963–965. URL: <https://www.ncbi.nlm.nih.gov/pubmed/4014848>.
- Trepanier, L., 2010. Acute vomiting in cats: Rational treatment selection. *Journal of Feline Medicine and Surgery* 12, 225–230. [10.1016/j.jfms.2010.01.005](https://doi.org/10.1016/j.jfms.2010.01.005).
- Wilson, D.V., Walshaw, R., 2004. Postanesthetic esophageal dysfunction in 13 dogs. *Journal of the American Animal Hospital Association* 40, 455–460. [10.5326/0400455](https://doi.org/10.5326/0400455).