



## Clinical Report

# Diagnosis, Surgery and Follow up of Sliding Hiatal Hernia in Two Cats

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### Abstract

**Case Description-** Two female domestic short-hair cats

**Clinical Findings-** The cats with clinical signs of regurgitation, dysphagia and respiratory distress were presented. Symptomatic sliding hiatal hernia was diagnosed by radiography in these cats.

**Treatment and Outcome-** The hernias were corrected surgically by only left-sided fundic gastropexy in one, and by reduction of hiatal opening and gastropexy in the other. Both animals were asymptomatic on re-examination and follow-up studies two, six and twelve months post surgery.

**Clinical Relevance-** This study revealed radiography and gastropexy as good diagnostic and treatment techniques, respectively in sliding hiatal hernia in cats.

**Key words-** Domestic short-hair cat, Sliding hiatal hernia, Esophagram, Gastropexy.

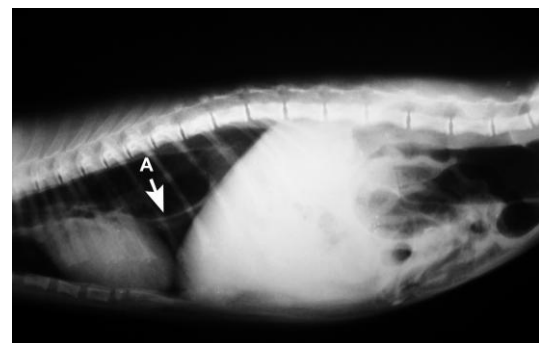
### Case Description

Two intact female DSH cats (6 weeks and 11 years old) were presented to small animal hospital, faculty of veterinary medicine, University of Tehran. On initial examination, the cats were bright and alert and the body conditions were moderate. In case No. 1 chief complaint was long term strenuous respiratory distress and in case No. 2 this was regurgitation and dysphagia. Case No. 2 had a history of parturition several weeks before presentation.

### Clinical Findings

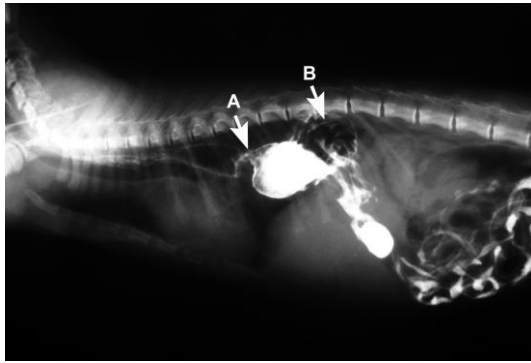
Clinical signs in case No. 1 included respiratory distress, hypersalivation, lethargy, dumbness, and rarely regurgitation and in case No. 2 regurgitation, dysphagia, respiratory distress, and vomiting were easily perceived. In survey lateromedial (L) and ventrodorsal (VD) radiographic projections, strip sign and soft tissue density was detectable adjacent to the left diaphragmatic

crus. Thoracic surface outline was lost in the left diaphragmatic crus. Cranial displacement of the gastric cardia had produced an abnormal gastric shape and the esophagus was dilated. Esophagogram was performed using barium sulfate powder (20 ml, 30% m/V) and radiography was done immediately and 10 minute after contrast administration. In the obtained radiographs, dilated esophagus was obvious and the gastroesophageal sphincter was within the thorax representing by a circumferentially narrowed area in the esophagus. Gastric cardia was also visible within the thorax (Fig. 1 and 2).



**Figure 1.** Survey lateromedial radiographic projection before surgery. Dilated esophagus and Tracheal strip sign are detectable in radiograph (A).

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**Figure 2.** Esophagogram performed before surgery. (A) Gastric cardia (B) Stomach.

### Treatment and Outcome

Due to the persistence of clinical signs despite altering the feeding regime, surgical intervention was recommended and the day after survey radiographs, surgery was done.

The cats were tranquilized with 5.5 mg/kg ketamine HCl (Ketamine 10%, Alfasan) and 0.05 mg/kg acepromazine maleate (Neurotranq, Alfasan) intramuscularly for catheterization and pre-surgical preparation. Then the cats were premedicated with 0.02 mg/kg atropine (Dicarto, Caspian Tamin pharmaceutical co.) subcutaneously. General anesthesia was induced with 5.5 mg/kg ketamine HCL (Ketamine 10%, Alfasan) and 0.27 mg/kg diazepam (Zepadic, Caspian Tamin pharmaceutical co.) intravenously and maintained with isoflurane (Isoflurane, Nicholas Piramal India limited) delivered in oxygen via endotracheal intubation. Before and during surgery all vital parameters were within normal limits. The hernia was approached via a ventral midline coeliotomy incision extending from the xiphoid process to the umbilicus. Abdominal viscera was retracted away from gastric fundus, gastrohepatic ligament was crushed and with the help of surgical gauze, liver was retracted medially then a type I (sliding) hiatal hernia was identified with a subjectively lax phrenico-esophageal ligament allowing the gastro-esophageal junction and gastric cardia to lie within the thoracic cavity. The hernia was easily reducible with caudal traction; however, it recurred as soon as traction was released. Surgical reduction of the hernia performed by left-sided fundic gastropexy.

In case No. 2, simple interrupted sutures were placed to reduce hiatal opening, using 3-0 coated polyglycolic acid (Supabon; Supa Medical devices), between the right and left crural muscles adjacent to the oesophageal hiatus and the corresponding VD aspect of the oesophagus and after that gastropexy performed. Care was taken not to include the vagal trunks in the sutures. In case No. 1, gastropexy was performed without any esophageal hiatus plication and narrowing. In

gastropexy procedures, A 2 cm incision of seromuscular layer was made in a cranial to caudal direction on the fundus of the stomach running parallel to the left cranialateral abdominal wall. A same length incision was made on the lateral aspect of the left abdominal wall through the peritoneum and transverse abdominal muscle starting, and running perpendicular with, the 11th rib to enable left side incisional gastropexy. The free edges of the seromuscular and the abdominal wall incisions were opposed with a single layer of simple continuous sutures using 2-0 coated polyglycolic acid (Supabon; Supa Medical devices). Completion of the gastropexy procedures resulted in sufficient caudal movement of the stomach and also create a mild degree of traction at the gastro-esophageal junction. Then Coeliotomy closure was performed (Fig. 3).



**Figure 3.** A seromuscular incision was made for gastropexy procedures.

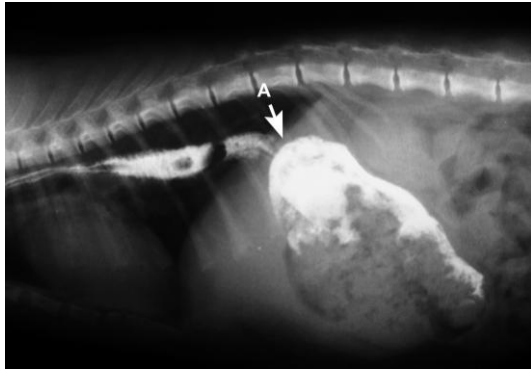
Cats recovered uneventfully from anesthesia, with postoperative analgesia provided by 3 mg/kg Tramadol (Tramadic, Caspian Tamin pharmaceutical co.) orally every twelve hours for three days. Cefazolin was prescribed for 5 days as the therapeutic antibiotic. Sucralfate and Ranitidine were also prescribed due to decrease signs of esophagitis.

New feeding regime recommended for the first two weeks post-operatively and the cats were regularly fed small meals of low fat and high protein liquefied food, three to five times a day with the hands on step and head up.

In both cases, follow-up radiographic evaluation seven days postoperatively, showed that the esophagus was still dilated; however, no sign of presence of the cardia and the sphincter was detectable in the thoracic cavity. Esophagograms also revealed dilation of the esophagus. In the repeat radiographs after twenty days postoperatively confirmed no sign for any esophageal abnormality and esophagogram presented the cardia and the sphincter positioned in the normal site (Fig. 4).

On re-examination two months after surgery, no further episodes of regurgitation, vomiting, and dyspnea had occurred and the cats were eating with better appetite. Follow-up telephone conversations with the owners six and twelve months after surgeries indicated that the cats

were in good general health, with a normal appetite and had suffered no further bouts of dyspnoea or other signs referable to either hiatal hernia or gastro-oesophageal reflux disease. No sign of laryngeal involvement was reported and the weak voice of the case 1 has changed to normal cat voice.



**Figure 4.** Twenty days postoperative esophagogram presented the cardia positioned in the normal site (A).

### Clinical Relevance

Sliding hiatal hernias can occur through a congenitally or traumatically enlarged esophageal hiatus. It can be distinct between congenital and acquired sliding hiatal hernias in small animals on the basis of age.<sup>7</sup> About 60% of hiatal hernias in dogs and cats occur in animals less than 1 year of age and are believed to be congenital, clinical signs may be observed immediately after weaning onto solid food, although acquired post-traumatic hiatal hernia can be occurred at any age.<sup>7, 17, 2</sup> Our findings were consistent with these reports. In canine patients, Chinese Shar-Peis and English bulldogs appear to have a breed predisposition.<sup>3, 13, 12, 10</sup> In feline cases, based on our present knowledge of literature and findings of this article, it seems to be more in DSH cat breed.<sup>7, 17, 20, 13, 4</sup>

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The disorder commonly happens as an intermittent sliding hiatal hernia in cats; because of its dynamic nature, it may not be seen on one radiograph; so several periodic plain radiographs, esophagrams, esophagoscopy, ultrasonography, computed tomography (CT), and fluoroscopic examination is sometimes necessary to confirm diagnosis.<sup>12, 5, 16, 14</sup> Of course in this study esophagrams were used for diagnosis and post surgical follow-up which is consistent with literature. It seems esophagram can be used as a standard due to high rate in confirmation of this disorder and its availability and feasibility.<sup>7, 13</sup>

In suspected hiatal hernia cases esophagram should be done through iodine compounds such as Gastrographin® to minimize irritation of tissues before surgery. In our cases, we used barium sulfate; so for relief of its irritant effects, surgery was postponed one day later.

Among surgical operation of case no. 1, due to tight and rigid phrenicoesophageal ligament after caudal traction of the stomach, prevention of complication of suturing of esophageal hiatus, and to minimize the time of surgery, gastropexy without any esophageal hiatus plication and narrowing was performed. So only left-sided fundic gastropexy was performed and esophagopexy and diaphragmatic hiatal plication-reduction leaved. Clinical and radiographic signs were not seen in this case 3 weeks after surgery, so it seems that surgeon can decide to perform minimal surgical procedures based on surgical findings to decrease surgery time and complications. In some cases with excessive visceral herniation that phrenicoesophageal ligament is much stretched and after gastric traction pressure to mediastinal cavity is probable this method cannot be advised, although more cases are needed to confirm this technique and to the best of our knowledge this method is not mentioned in references at the moment.

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## چکیده

### تشخیص، جراحی و پیگیری فتق هیاتال اسلایدینگ در دو گربه

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#### توصیف بیمار - دو گربه‌ی ماده‌ی موکوتاه اهلی

یافته‌های بیماری - گربه‌ها با علائم برگرداندن غذا، دیسفاژی و مشکلات تنفسی مراجعه کرده بودند. فتق هیاتال اسلایدینگ در این گربه‌ها با کمک رادیولوژی تشخیص داده شد.

درمان و نتیجه - فتق در این بیماران با جراحی و گاستروپکسی (ثابت کردن) فوندوس معده به سمت چپ در یک بیمار و کاهش اندازه‌ی هیاتوس و گاستروپکسی در دیگری اصلاح گردید. بیماران در معاینات پس از جراحی و پیگیری پس از ۲، ۶ و ۱۲ ماه هیچگونه علائم بالینی و رادیوگرافی نشان ندادند.

کاربرد بالینی - این مطالعه نشان داد که رادیوگرافی و گاستروپکسی روش‌های مناسبی برای تشخیص و درمان فتق هیاتال اسلایدینگ در گربه‌ها هستند.

کلمات کلیدی - گربه‌ی موکوتاه اهلی، فتق هیاتال اسلایدینگ، ازوفراگام، گاستروپکسی.