ESOPHAGOSCOPY AND GASTROSCOPY

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ESOPHAGOSCOPY
The term esophagoscopy refers to examination of the lumen and mucosal lining of the esophagus with endoscopic equipment.

Esophagoscopy is indicated for the evaluation of animals with signs of esophageal disease, including regurgitation, dysphagia, odynophagia, and excessive salivation. This noninvasive modality allows visual examination of the esophageal mucosa and lumen and facilitates the procurement of specimens for biopsy, cytology, and culture. Thus esophagoscopy is most effective for obtaining a definitive diagnosis of conditions involving the mucosa or abnormalities within the lumen, including esophageal foreign body, esophagitis, esophageal stricture, esophageal neoplasia, diverticulum, vascular ring anomaly, and gastroesophageal intussusception. Compared with contrast radiography, esophagoscopy is less definitive for diagnosing megaesophagus and other motility disorders, diverticulum, hiatal hernia, and compression by peri-esophageal masses, although it often provides valuable diagnostic information in these situations. Esophagoscopy can also be used as a therapeutic intervention to dilate esophageal strictures, remove esophageal foreign bodies, place indwelling gastrostomy or esophagostomy feeding tubes and ablate neoplastic tissue with lasers.

PROCEDURE
The anesthetized and intubated patient is placed in a left lateral recumbent position with an oral speculum securely in place. The endotracheal tube is particularly important for preventing the aspiration of refluxed or regurgitated material from the oropharynx during the procedure.

With the animal’s head and neck extended, the endoscope is directed centrally through the oropharynx and guided dorsal to the endotracheal tube and larynx so that the cranial esophageal sphincter (CES) comes into view. The CES is the entrance to the esophagus and is normally closed, appearing as a star-shaped area of folded mucosa dorsal to the larynx. With insufflation and minimal pressure of the endoscope tip against the CES, the scope is easily advanced through the low-resistance sphincter into the cervical esophagus.

The cervical esophagus is normally collapsed so that as the endoscope passes through the sphincter, a brief “redout” usually obscures visibility. Thus before the scope is advanced farther, the esophagus should be insufflated with air until the lumen is clearly visualized. Within the esophagus the endoscope should meet little or no resistance as it is advanced. The esophagus is essentially a straight tube except for a light flexure at the thoracic inlet, where the cervical and thoracic esophagus meet. The operator should advance the scope down the esophagus in a slow continuous motion, using only minor adjustments in tip deflection and torque to maintain a full panoramic view of the lumen and mucosal surfaces. Air should be insufflated intermittently to keep the lumen open. The lumen of the thoracic esophagus generally opens with minimal insufflation. Pulsations of the aorta are seen at the level of the base of the heart.

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The patient should always be placed in left lateral recumbency for gastroscopy. The antrum and pylorus are away from the tabletop in this position, and this significantly improves the endoscopist’s ability to completely examine and more readily traverse these structures with the scope. Every patient that undergoes gastroscopy should have a complete examination of all areas of the stomach. It is essential that the beginning endoscopist learn to identify landmarks properly. It is only after familiarity with luminal gastric anatomy is developed that maneuvering the endoscope to obtain a retroflexed view of the cardia, advancing the endoscope around the incisura angularis to reach the antrum, and traversing the pyloric canal become consistent and effortless procedures.

Gastroesophageal Junction
Because the esophagus is essentially in a posterior plane compared with the location of the stomach, the endoscope tip needs to be deflected when it is in the distal esophagus before it can be successfully advanced to the stomach. As the endoscope is advanced to the distal esophagus, the endoscope tip should be centered at the gastroesophageal orifice. The endoscope tip is deflected to the left approximately 30 degrees with simultaneous slight upward deflection as the gastroesophageal junction is passed. This is usually easily accomplished by rotating the outer control knob in a counterclockwise direction for left deflection and by rotating the inner control knob in a counterclockwise direction for upward deflection. In some patients minimal or no upward deflection is needed. When properly directed there should be no resistance to advancing the endoscope to the stomach.

Proximal Stomach and Gastric Body
The endoscope tip should be positioned just through the gastroesophageal junction so that an overview and orientation within the gastric lumen can be obtained. As the tip enters the stomach, the rugal folds, generally on the greater curvature of the body, will be seen. Often the stomach walls will be partially or completely collapsed, especially in medium to large size dogs or if only a small volume of air was insufflated during esophagoscopy. In this

APPEARANCE OF A NORMAL ESOPHAGUS
The normal esophagus in an animal that has been fasted is empty or contains a minimal amount of clear fluid or foam. If the esophagus contains ingesta, a large pool of fluid, or bilious fluid, then gastroesophageal reflux, motility dysfunction, or esophageal obstruction should be suspected.

The feline esophagus is composed of striated muscle in the proximal two-thirds and smooth muscle in the distal one-third, whereas the canine esophagus is composed almost entirely of striated muscle. Longitudinal folds are found throughout the canine esophagus and in the feline cranial esophagus. In the cat, circumferential mucosal folds in the caudal esophagus form prominent annular ridges (a “herringbone” pattern) that appear endoscopically as a pattern of circular rings. This ringlike appearance is not seen in the dog. The normal esophageal mucosa in cats and dogs is smooth, glistening, and pale pink or grayish pink in color. It is noticeably less red than the gastric mucosa.
instance the view of the stomach will be quite limited, and it is
necessary to pause and insufflate air.

Generally the distention should be at least to the point that
the rugal folds begin to separate. During insufflation the
endoscopist must be careful to not cause overdistention of
the stomach, since this may result in significant
cardiopulmonary compromise. When the stomach is over-
distended the rugal folds will be almost completely flattened
or not detectable, superficial blood vessels can sometimes be
observed, and there may be mucosal blanching. Usually the
respiratory rate increases significantly. A sufficient volume of
air to moderately deflate the stomach should be suctioned off
as soon as possible. During the course of most gastric
examinations, both air insufflation and suction are commonly
used to maintain a proper and safe balance of distention.
Several observations should be made during initial
examination of the stomach. These include presence of any
fluid or ingesta, ease of distendability of the gastric walls
when air is insufflated, and gross appearance of the rugal
folds and mucosa.

As the endoscope is gradually advanced through the
proximal stomach, the area of the gastric body can be
thoroughly evaluated by using the control knobs to deflect the
endoscope tip or by rotating the insertion tube with the right
hand. With the patient in left lateral recumbency and the
endoscope held in a conventional manner (i.e., buttons up),
the endoscopic view is predictable. The smooth lesser
curvature is on the endoscopist’s right, and the rugal folds of
the greater curvature are seen below and to the left. Usually
any required direction changes can be made with the left
thumb on the inner control knob and the right hand controlling
rotation. Only minor direction changes are usually needed to
provide a panoramic view. The endoscope is advanced
along the greater curvature until the angulus is identified.
The angulus appears as a large fold that extends from the
lesser curvature. The angulus is an important landmark that
separates the body of the stomach form the antrum. With the
patient in left lateral recumbency, the antrum will be directed
up or away from the tabletop. The endoscopist must be able
to maneuver around the angulus to advance the endoscope
to the antrum, pylorus, and duodenum. This is one of the
more difficult steps in which to gain proficiency when learning
gastroscopy techniques.

Retroversion (J-Maneuver)

The importance of the retroversion maneuver is that it
provides an en face view of the angulus and the cardia and
fundus. On forward view only a tangential view of the
angulus is obtained, and the cardia and part of the fundus are
not seen at all. Failure to thoroughly examine the proximal
stomach may cause lesions such as erosions, ulceration, or
neoplasia, or a foreign body wedged in the cardia or fundus
to be missed.

To provide an en face view of the angulus, the retroversion
maneuver is initiated at a point opposite the angulus. The
endoscope is advanced along the greater curvature to the
level of the distal body and proximal antrum. The inner
control knob is turned counterclockwise with the left thumb,
and as the endoscope is gradually advanced, the angulus
can be seen en face. There are variations of normal
appearance. The endoscope tip is then deflected upward as
far as possible (full counter-clockwise rotation of the inner
control knob) as the endoscope is simultaneously advanced
a little further. Generally, at least 180 degrees of tip
deflection will be required for this maneuver. Many newer
endoscopes are capable of 210 degrees of upward tip
deflection. This further advance provides a retroflexed view
of the endoscope as it enters the stomach through the cardia.
Pulling the endoscope back once this view is attained draws
the endoscope tip closer to the cardia. In cats the retroversion maneuver is started when the endoscope tip is in
the mid body area. The tip is deflected upward as the
endoscope is advanced. Because of a smaller working area
when compared with most dogs, an en face view of the
angulus is not usually achieved in cats.

Antrum

The antrum differs from the body of the stomach in that
there are no rugal folds, and peristaltic contractions are
sometimes observed in the gastric body. To advance from
the distal body to the antrum, upward deflection (counterclockwise rotation of inner deflection knob) is applied
as the instrument tip is passed along the distal greater
curvature. This usually reveals a view of the angulus, and
from this position the endoscopist can appreciate the
appearance of two separate “tunnels”, one on each side of
the angulus. The upper area is the gastric body (the first
area viewed is the lesser curvature as it extends beyond the
angulus), and the more dependent tunnel is the antrum.
From this location the retroversion maneuver can be
performed, or the endoscope can be advanced to the antrum.

Antral peristaltic waves may be observed when the
endoscope is in the mid to distal gastric body. These are
seen as round and symmetrical rings that form in the
proximal antrum and sweep toward the pylorus as a rolling
wave. These contractions are generally not observed in cats
unless metoclopramide or cisapride has been administered.
When present they usually occur at a frequency of three to
four contractions per minute.

Occasionally the endoscopist will encounter difficulty in
maintaining the endoscope tip in proper position in the distal
antrum to facilitate smooth passage through the pylorus
when there are active antral contractions. The pylorus is
often persistently closed during periods of antral contractions.

Usually there are no folds in the antrum. Refluxed
duodenal bile may be present and in some cases active
reflux can be observed during the procedure. The antrum
should be evaluated carefully for presence of mucosal
hypertrophy or folds that may result from chronic
inflammatory diseases or chronic gastric hypertrophy, polyps,
ulceration, and masses. When present, gastric neoplasia
commonly involves the antrum and lesser curvature of the
body. Adenocarcinoma is the most common malignant tumor
in the stomach of the dog, while lymphosarcoma is the most
common in the cat.

REFERENCES
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