

# A NARROWING OF THE ESOPHAGUS (ESOPHAGEAL STRICTURE)

## BASICS

### OVERVIEW

- The esophagus is the tubular organ that runs from the throat to the stomach; an esophageal stricture is an abnormal narrowing of esophageal lumen (the inner open space of the esophagus)

### GENETICS

- No apparent genetic basis

### SIGNALMENT/DESCRIPTION of ANIMAL

#### Species

- Dogs and cats

#### Mean Age and Range

- Any age; strictures secondary to cancer tend to occur in middle-aged to older animals

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Clinical signs are related to the severity and extent of narrowing or stricture
- Regurgitation (return of food or other contents from the esophagus or stomach back up through the mouth)
- Liquid meals often tolerated better than solid meals
- Difficulty swallowing (known as “dysphagia”)—seen with upper esophageal strictures
- Drooling or salivation
- Howling, crying, or yelping during swallowing when the animal has active inflammation of the esophagus (known as “esophagitis”)
- Good appetite initially; eventually, lack of appetite (anorexia) with progressive esophageal narrowing and inflammation
- Weight loss and malnutrition as the disease progresses
- May see aspiration pneumonia with progressive regurgitation and difficulty swallowing (dysphagia)
- Weight loss to severe weight loss with muscle wasting (known as “cachexia”)—in animals with chronic or advanced stricture
- Excessive production of saliva and drooling and/or pain on feeling (palpation) the neck and esophagus—may be seen in animals with inflammation of the esophagus (esophagitis) at the same time as the stricture is present
- Abnormal lung or breathing sounds (such as wheezes and coughing)—may be detected in animals with aspiration pneumonia

### CAUSES

- Backward or reverse flow of stomach contents into the esophagus (known as “gastroesophageal reflux”) during anesthesia—most common
- Ingestion of chemical irritants
- Persistent vomiting
- Esophageal retention of pills and capsules
- Backward or reverse flow of stomach contents into the esophagus, unrelated to anesthesia (known as “gastroesophageal reflux disease”)
- Esophageal foreign body
- Esophageal surgery
- Cancer
- Mass lesion (known as a “granuloma”) secondary to a parasite, *Spirocerca lupi*; occasionally seen in the southeastern United States

### RISK FACTORS

- Poor preparation (either not fasted adequately or prolonged fasting) prior to anesthesia places some patients at risk for backward or reverse flow of stomach contents into the esophagus (gastroesophageal reflux), leading to inflammation of the esophagus (esophagitis), and subsequently to scarring or narrowing of the esophagus (stricture formation)
- Certain drugs used prior to anesthesia (such as diazepam, atropine, pentobarbital, phenothiazine-derivative tranquilizers)—decrease the pressure of the muscle that closes the opening between the esophagus and stomach (known as the “gastroesophageal sphincter”) and can result in the backward or reverse flow of stomach contents into the esophagus (gastroesophageal reflux)

## TREATMENT

### HEALTH CARE

- Inpatient management initially
- May discharge patients from the hospital after addressing hydration needs, achieving dilation of the affected segment, and initiating any needed treatment for aspiration pneumonia and inflammation of the esophagus (esophagitis)
- Intravenous fluids—may be needed to correct hydration status
- Medications—give by injection following dilation procedures, to facilitate healing
- Oxygen—may be needed for patients with severe aspiration pneumonia

### ACTIVITY

- Unrestricted for most cases
- May be limited for patients with aspiration pneumonia

### DIET

- Withhold feeding patients by mouth that have severe inflammation of the esophagus (esophagitis) and following dilation procedures
- Temporary feeding tube may be placed at the time of esophageal dilation as a means of providing continual nutritional support
- Give liquid meals when restarting feeding by mouth

### SURGERY

- Dilate the narrowed opening of the esophagus by inserting one or more cylindrical medical instruments to gradually open up the narrowed area (known as “Bougienage tube dilation”)
- Mechanical dilation using balloon catheter to open up the narrowed area, with observation of the procedure and esophagus using a special lighted medical instrument called an “endoscope” (general term for procedure is “endoscopy”) or using special X-ray equipment called a “fluoroscope” that allows one to see movement of the balloon (procedure is “fluoroscopy”); perform endoscopy after dilation to assess damage to the lining of the esophagus; redilation at 1- to 2-week intervals may be necessary until stricture is resolved
- Surgical removal of the narrowed section of the esophagus—reportedly has less than a 50% success rate and often is associated with substantial postoperative complications
- Other surgical methods

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Administer medications by injection following dilation procedures and if severe inflammation of the esophagus (esophagitis) is present
- When administering medications by mouth is resumed, dissolve medications in water and give by syringe or give directly via a feeding tube to ensure that they reach the stomach
- Anti-inflammatory dosage of corticosteroids (such as prednisone)—may help prevent scarring and restricture during the healing phase
- Injections of triamcinolone directly into the area where the stricture was located, after dilation of esophageal stricture, may be helpful in decreasing esophageal scarring
- [Sucralfate](#) suspension
- Agents to decrease stomach-acid secretion (such as famotidine, ranitidine, cimetidine, omeprazole)—to prevent irritation of the esophageal lining by backward or reverse flow of stomach contents into the esophagus (gastroesophageal reflux)
- Drugs that improve the propulsion of contents through the stomach and intestines (known as “gastrointestinal prokinetic agents,” such as cisapride, metoclopramide)—may increase tone of the muscle between the stomach and esophagus (gastroesophageal sphincter)
- [Lidocaine](#) solution—to manage severe esophageal pain

## FOLLOW-UP CARE

### PATIENT MONITORING

- Repeat barium contrast X-rays or endoscopy every 2 to 4 weeks until clinical signs have resolved and adequate esophageal lumen size has been achieved

### PREVENTIONS AND AVOIDANCE

- Proper patient preparation prior to anesthesia (12-hour preoperative fast)

- Avoid certain drugs (such as diazepam, atropine, pentobarbital, morphine, phenothiazine-derivative tranquilizers) prior to anesthesia, if possible
- If gastroesophageal reflux is present, avoid late-night feedings as they tend to decrease the ability of the muscle between the stomach and esophagus to remain closed during sleep
- Prevent animal from ingesting caustic substances and foreign bodies

#### **POSSIBLE COMPLICATIONS**

- Esophageal tear or perforation—a life-threatening complication of esophageal stricture dilation; usually occurs at the time of dilation, although it has been observed several days to weeks later
- Risk for aspiration pneumonia
- Excessive esophageal bleeding and/or introduction of bacteria into the blood stream (known as “bacteremia”) can occur secondary to esophageal dilation

#### **EXPECTED COURSE AND PROGNOSIS**

- Generally, the longer the stricture, the more guarded the prognosis
- Esophageal strictures due to scarring—generally, fair to guarded prognosis; many recur despite repeated esophageal dilation; improvement without cure is a more realistic goal
- Esophageal strictures secondary to cancer—poor prognosis

#### **KEY POINTS**

- Animals generally do not recover from untreated esophageal stricture
- Benign strictures are best treated by esophageal dilation
- Patients with esophageal strictures secondary to cancer have a poor prognosis
- High probability of happening again (recurrence) and common need for multiple dilation procedures
- Possibility of improvement (such as decreased to absent regurgitation, ability to eat softened canned foods but not dry food), but not cure

### **BASICS**

#### **OVERVIEW**

- Nail and nail-bed disorders are a group of abnormalities or diseases that affect the nail or claw and/or the tissues surrounding the nail or claw (that is, the “nail bed”)
- “Onycho-“ or “onych-“ refers to the nail or claw
- Inflammation of soft tissue around the nail or claw (known as “paronychia”)
- Fungal infection of the nail or claw (known as “onychomycosis”)
- Brittle nails or claws that tend to split or break (known as “onychorrhexis”)
- Sloughing of the nail or claw (known as “onychomadesis”)
- Deformity of the nail or claw caused by abnormal growth (known as “nail dystrophy”)

#### **SIGNALMENT/DESCRIPTION of ANIMAL**

##### **Species**

- Dogs and cats

##### **Breed Predispositions**

- Dachshund—susceptible to brittle nails that tend to split or break (onychorrhexis)

#### **SIGNS/OBSERVED CHANGES in the ANIMAL**

- Licking
- Lameness
- Pain
- Swelling, redness of the skin and tissues (known as “erythema”), and discharge from the area where the skin and nail or claw come together at the top of the toe (known as the “nail fold” or “claw fold”)
- Deformity or sloughing of one or more nails or claws

#### **CAUSES**

##### **Inflammation of Soft Tissue Around the Nail or Claw (Paronychia)**

- Infection or infectious disease—bacteria, fungus (known as “dermatophytosis”), yeast (*Candida*), demodectic mange mites (condition known as “demodicosis”), leishmaniasis
- Immune-mediated disease—types include the following: pemphigus, bullous pemphigoid, systemic lupus erythematosus, drug eruption, lupoid onychodystrophy

- Tumor or cancer—types include the following: squamous cell carcinoma, melanoma, eccrine carcinoma, osteosarcoma, subungual keratoacanthoma, inverted squamous papilloma
- Abnormal communication between an artery and a vein (known as an “arteriovenous fistula”)

#### ***Fungal Infection of the Nail or Claw (Onychomycosis)***

- Dogs—*Trichophyton mentagrophytes* (usually generalized fungal infection of the skin, involving the nails)
- Cats—*Microsporium canis*

#### ***Brittle Nails or Claws that Tend to Split or Break (Onychorrhexis)***

- Unknown cause (so called “idiopathic disease”)—especially in dachshunds; involves multiple nails
- Trauma
- Infection—fungal infection (dermatophytosis), leishmaniasis

#### ***Sloughing of the Nail or Claw (Onychomadesis)***

- Trauma
- Infection
- Immune-mediated disease—types include the following: pemphigus, bullous pemphigoid, systemic lupus erythematosus, drug eruption, lupoid onychodystrophy
- Decreased or inadequate blood flow (known as “vascular insufficiency”)—inflammation of the blood vessels (known as “vasculitis”); clumping together or agglutination of red-blood cells when the temperature of the cells drops below normal body temperature (known as “cold agglutinin disease”), such as exposure of the legs to cold weather
- Tumor or cancer—types include the following: squamous cell carcinoma, melanoma, eccrine carcinoma, osteosarcoma, subungual keratoacanthoma, inverted squamous papilloma
- Unknown cause (so called “idiopathic disease”)

#### ***Deformity of the Nail or Claw Caused by Abnormal Growth (Nail Dystrophy)***

- Condition caused by excessive levels of growth hormone, leading to enlargement of bone and soft-tissues in the body (known as “acromegaly”)
- Increased levels of thyroid hormone in the cat (known as “feline hyperthyroidism”)
- Zinc-responsive skin disorder (known as “zinc-responsive dermatosis”)
- Congenital (present at birth) malformations of the nail or claw

#### **RISK FACTORS**

- Inflammation of soft tissue around the nail or claw (paronychia) due to infectious causes—decreased ability to develop a normal immune response (known as “immunosuppression”), which may be related to immune-system problem of the body or to the use of medications to decrease the immune response; feline leukemia virus (FeLV) infection; trauma; and diabetes mellitus (sugar diabetes)
- Sloughing of the nail or claw due to bacterial infection (bacterial onychomadesis)—excessively short nail trimming (into the quick) postulated to increase likelihood of bacterial infection and subsequent sloughing of the nail or claw

## **TREATMENT**

#### **HEALTH CARE**

##### ***Inflammation of Soft Tissue Around the Nail or Claw (Paronychia)***

- Surgical removal of the hard part of the nail (known as the “nail plate” or “shell”)—provide adequate drainage; bandage foot following procedure
- Antimicrobial soaks
- Identify underlying condition and treat specifically

##### ***Fungal Infection of the Nail or Claw (Onychomycosis)***

- Antifungal soaks—chlorhexidine, povidone iodine, lime sulfur
- Surgical removal of the hard part of the nail (nail plate or shell)—may improve response to medication administered by mouth or injection (known as “systemic medication”)
- Amputation of the third bone of the toe (known as the “third phalanx”), which is continued by the nail or claw

##### ***Brittle Nails or Claws that Tend to Split or Break (Onychorrhexis)***

- Repair with fingernail glue (type used to attach false nails in humans), as performed or directed by your pet’s veterinarian
- Remove splintered pieces
- Amputation of the third bone of the toe (third phalanx), which is continued by the nail or claw
- Treat underlying cause

##### ***Sloughing of the Nail or Claw (Onychomadesis)***

- Antimicrobial soaks
- Treat underlying cause

##### ***Deformity of the Nail or Claw Caused by Abnormal Growth (Nail Dystrophy)***

- Treat underlying cause

##### ***Tumor or Cancer***

- Depends on biologic behavior of specific tumor

- Surgical removal of the tumor
- Amputation of toe
- Amputation of leg
- Chemotherapy
- Radiation therapy

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Bacterial infection/inflammation of soft tissue around the nail or claw (paronychia)—antibiotics based on bacterial culture and sensitivity, administered by mouth or injection (systemic antibiotics); cephalosporins pending culture result
- Yeast (*Candida*) infection/inflammation of soft tissue around the nail or claw (paronychia)—ketoconazole administered by mouth (systemic treatment); nystatin or miconazole applied to the affected area directly (topical treatment)
- Fungal infection of the nail or claw (onychomycosis)—griseofulvin or ketoconazole administered by mouth (systemic treatment) for 6 to 12 months until negative fungal cultures; itraconazole administered by mouth for 3 weeks and then as directed by your pet’s veterinarian
- Sloughing of the nail or claw (onychomadesis)—depends on cause; medication to decrease the immune response (known as “immunosuppressive therapy”) for immune-mediated diseases
- Often-used medications include cyclosporine, tetracycline with niacinamide, pentoxifylline, vitamin E, essential fatty acid supplementations, and chemotherapeutic agents (such as azathioprine, chlorambucil)

## FOLLOW-UP CARE

### PATIENT MONITORING

- Depends on underlying cause

### PREVENTIONS AND AVOIDANCE

- Depend on underlying cause

### POSSIBLE COMPLICATIONS

- Depend on underlying cause

### EXPECTED COURSE AND PROGNOSIS

- Bacterial infection/inflammation of soft tissue around the nail or claw (paronychia) or fungal infection of the nail or claw (onychomycosis)—treatment may be prolonged and response may be influenced by underlying factors that decrease the immune response (immunosuppressive factors)
- Fungal infection of the nail or claw (onychomycosis) and brittle nails or claws that tend to split or break (onychorrhexis)—may require amputation of the third bone of the toe (third phalanx), which is continued by the nail or claw, in order to get resolution
- Deformity of the nail or claw caused by abnormal growth (nail dystrophy)—prognosis is good when underlying cause can be effectively treated (such as cases with increased levels of thyroid hormone [hyperthyroidism] or zinc-responsive skin disorders [dermatosis])
- Sloughing of the nail or claw (onychomadesis)—prognosis depends on underlying cause; immune-mediated diseases and blood vessel/blood flow (vascular) problems carry a more guarded prognosis than do trauma or infectious causes
- Tumor or cancer—some can be totally removed surgically or removed by amputation of the toe; others are highly malignant and may have already spread (known as “metastasis”) by the time of diagnosis

## KEY POINTS

- Nail and nail-bed disorders are a group of abnormalities or diseases that affect the nail or claw and/or the tissues surrounding the nail or claw (that is, the “nail bed”)