

## ENDOSCOPY (Including bronchoscopy, colonoscopy, rhinoscopy)

An endoscope is a device that allows us to look inside the body without cutting it open. It consists of a long, flexible tube with a handle and some knobs at one end. Fiberoptic tubes send light down to the tip of the scope and transmit images back to the operator. The tube also has channels through which water or air may be squirted and tiny instruments may be passed. The handle end has the controls for these functions and knobs that allow the operator to direct the tip of the tube up, down or from side to side. The doctor can either look through the viewfinder at the handle end or the handle may be attached to video equipment, allowing the image to be projected onto a television or computer screen.

Endoscopes are used to look into passageways into the body. For instance, the tube may be passed down the throat, allowing the inside of the esophagus, the stomach or the intestines to be viewed. Tiny biopsy samples of the lining of the stomach or intestines may be obtained. Little grabbers can be passed through the tube to grasp and pull out foreign objects that may have been swallowed. Passing the tube the other way, up from the rectum, is called colonoscopy because it allows the doctor to look inside the colon. Tumors, polyps and other abnormalities can be removed or biopsied this way.

The view through the tube may also let the surgeon see where larger instruments are going that have been inserted into the abdomen or chest through a small incision. This is commonly done to avoid making a large incision that would allow the surgeon to directly view the surgery site. Laparoscopy is the use of the endoscope inside the abdomen, pelviscopy is in the pelvic area and thoracoscopy is looking inside the chest (thorax).

Small endoscopes can be passed into the nose, and thus the sinus cavities, which is called rhinoscopy (rhino means nose). In a urethroscopy or cystoscopy procedure the tube goes through the urethra into the bladder or prostate gland. The trachea (windpipe) and bronchi (smaller airways in the lungs) can also be viewed through an endoscope. This is called bronchoscopy.

All endoscopy procedures require anesthesia. This is usually the most risky part of the procedure but often saves the much greater risk of general surgery. Today's modern anesthetics and monitoring equipment make the risks for these procedures low.

## BRONCHOSCOPY

Bronchoscopy is used to diagnose a cough or breathing difficulties. It can also be used to get more information about areas that look suspicious for cancer on x-rays. The pet is anesthetized and the tube is passed into the throat, through the voicebox, or larynx, and down into the windpipe and hence to the smaller airways that branch off from it.

Often fluid such as saline is squirted through the endoscope and then sucked back in again, collecting cells and bacteria from inside the airways as it comes back. This fluid can then be examined for abnormal cells or cultured for bacteria or fungal infection. Tiny samples of the lining of the airways or suspicious areas can be harvested for examination. These samples will be sent to a laboratory for analysis by a veterinary pathologist.

Uncommon risks from the bronchoscopy procedure include anesthetic complications, spread of infection that is already present or perforation of an airway.

Some animals have difficulty breathing during or immediately after the procedure – an asthma patient may suffer and asthma attack. Most patients recover quickly and are sent home the same day.

Bronchoscopy does not always provide a diagnosis in every case. Some portions of the lungs cannot be examined well through the scope. Although the pet usually goes home right away it may take a week to get biopsy and culture reports back from the laboratory.

## CYSTOSCOPY/URETHROSCOPY

This procedure may be done in cases of chronic infection, urinary incontinence or blood in the urine. This is a common procedure in humans but more rare in pets because many dogs and cats are too small for the endoscope to pass. When biopsies of the vagina or urinary bladder are taken they are small and heal rapidly without any stitches. The downside to this is that the samples may be too small to ensure a diagnosis or the area needed may not be reachable through the scope.

Risks include that from anesthesia, perforation or tearing of the vagina or bladder and an increased risk of infection afterwards. Most patients recover quickly and are sent home the same day. Although the pet usually goes home right away it may take a week to get biopsy and culture reports back from the laboratory.

## GI ENDOSCOPY

The GI tract, or gastrointestinal tract, includes the esophagus, stomach and small intestine, which are accessible through the mouth, and the colon, which is accessible via the rectum. Air is squirted down the tube to inflate the stomach and intestines enough to see them well – picture looking into a deflated rubber glove and trying to see your way into the fingers with a small tube, versus doing it with the glove blown up. Endoscopy of the GI tract is used to diagnose causes of vomiting, diarrhea or blood in the stool. Multiple “punch” biopsies of the lining of the stomach or intestines can be obtained with the endoscope. These samples are small and heal rapidly without any stitches.

Endoscopy can also be used to remove foreign objects that a pet may have swallowed. Pins and needles, coins and fabric are examples of items small enough to retrieve with the scope.

A special feeding tube called a PEG tube can be placed with an endoscope as well. PEG tubes provide a simple, painless way to deliver food to an animal that cannot or will not eat by itself. Far simpler than trying to force food and water into a dog’s or cat’s mouth multiple times a day, the PEG tube lets you squirt liquid food directly into the stomach. For example, cats with the liver disease called hepatic lipidosis

The PEG tube is made of latex. A small incision is made in the skin and through the muscle adjacent to the stomach. The tube is then passed into the abdomen and another small incision is made to push it into the stomach itself. A balloon at the tip of the latex tube is blown up to prevent the tube from sliding back out. No stitches are needed to hold it in place. When it is no longer needed, the balloon is deflated and the tube removed without the need for anesthesia or further surgery.

may take months to recover their appetite. PEG tubes are used for inflammatory bowel disease, during recovery from major surgeries, or when burns, fractures or other mouth or throat injuries prevent eating for long periods of time.

Besides the anesthetic risks, possible complications include vomiting and retching during or afterwards, perforation of an area or organ such as the stomach, or circulatory problems from air in the stomach.