



## Veterinary Specialists of Alaska, P.C. Client Information Sheet: Minimally Invasive Surgery: Laparoscopy and Thoracoscopy

### Minimally Invasive Surgery: Laparoscopy and Thoracoscopy

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In our ongoing effort to provide the most up-to-date technology and surgical techniques for our patients and to minimize postoperative pain and recovery time, we have adopted the techniques of minimally invasive surgery. We currently perform laparoscopic and thoracoscopic surgery wherever appropriate. Please also view our handout on arthroscopic surgery in our educational library, a minimally invasive method of joint surgery.

These techniques represent advances in technology which have allowed the development of surgical fiberoptic cameras and light sources referred to as “scopes”. Using this technology, the tip of a scope can be introduced into the body cavity through a small incision providing a magnified view of the inside of the cavity.



Laparoscopic Ovariectomy (spay) at Veterinary Specialists of AK.

Laparoscopy is the term used for inspecting the abdominal cavity (belly) using a small fiberoptic camera. Thoracoscopy describes the use of this technology to evaluate the thoracic cavity (chest). Specialized surgical instruments have been developed for use in conjunction with the camera and light source. These instruments are also designed to be introduced into the body cavity or joint through a small incision and are used to manipulate tissues and perform specific maneuvers necessary to complete specific procedures with minimal trauma to surrounding tissues and organs.

With this technology, surgeons can thoroughly inspect the desired cavity and perform a variety of surgical procedures through two or more small incisions. The abdomen, for example, can be explored laparoscopically by creating two or three small incisions. With the traditional approach to the abdomen, the incision often extends the entire length of the abdomen. Because the tip of the camera, or scope, is small it can be manipulated into areas that are difficult, or impossible, to expose through a standard approach. Furthermore, the image is magnified and is projected onto a monitor screen. Consequently, the surgeon is actually able to see the regional structures much more clearly than is possible through a traditional “open” approach. In summary, this technology actually provides the surgeon with a better view of the area of interest while significantly decreasing tissue trauma and patient discomfort associated with the surgical approach. By utilizing this technology wherever feasible, we are able to provide your pet with the best possible treatment while minimizing postoperative pain and recovery time.



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### Laparoscopy

Laparoscopy has been utilized with increasing frequency in veterinary surgery over the last decade. This stems from the desire to decrease patient discomfort and postoperative recovery time and from technological advances in equipment and surgical techniques.

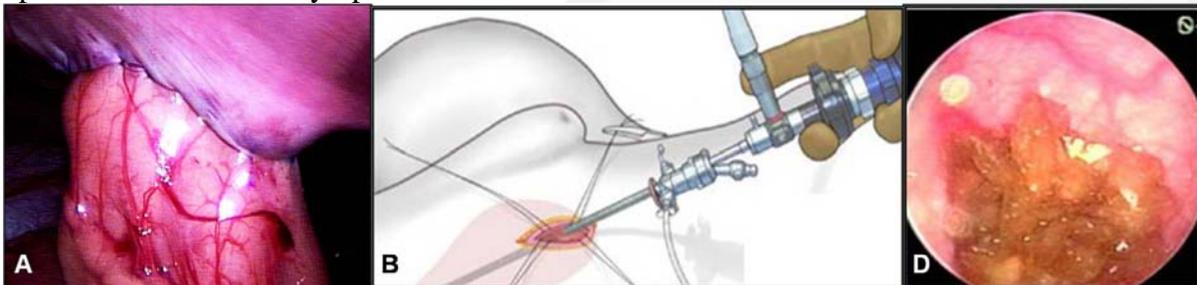
During laparoscopy, the abdomen is first distended with gas (carbon dioxide), and then the tip of a fiber optic camera or scope and instruments are introduced into the abdominal cavity to inspect the organs, and to perform various procedures. Because there is less tissue disruption than is associated with standard open procedures, there is usually less postoperative pain. For this reason, laparoscopy is often preferred over a standard surgical procedure especially in older, debilitated animals. Many of these patients can be released from the hospital on the day of surgery.



A: Spay using an abdominal retractor. B: Incision after an extensive abdominal procedure. C: Portal placement for laparoscopic spay (Image courtesy: Dr. C. Rawlings). E: Incision after laparoscopic spay. (Pictures A, B, E: Image courtesy D. von Pfeil).

This technique can be used for minimally invasive evaluation of all abdominal organs, such as the liver, biliary system, pancreas, kidney, spleen, bowel, and genitourinary tract. Tissue samples can be obtained from these organs if necessary. Several surgical procedures can be performed either completely in the abdomen, or laparoscopically assisted.

Laparoscopically assisted procedures are those in which the laparoscope and instrumentation are used to identify intra-abdominal organs and, if necessary, move them to the exterior through a small incision so procedures can be performed. For example, full thickness intestinal biopsies can be performed by exteriorizing parts of the gastrointestinal tract through a single small incision. The biopsy specimen is collected and the bowel is then sutured closed and returned to the abdominal cavity. Bladder stones can be similarly removed using minimally invasive, laparoscopic assisted techniques. A gastropexy for prevention of gastric dilatation and volvulus (see our handout on laparoscopic gastropexy), is another example of a laparoscopic assisted procedure performed at Veterinary Specialists of Alaska.



A: Laparoscopic view after gastropexy (Courtesy: Dr. E. Monnet). B & C: Cystoscopy (Courtesy: Dr. C. Rawlings).



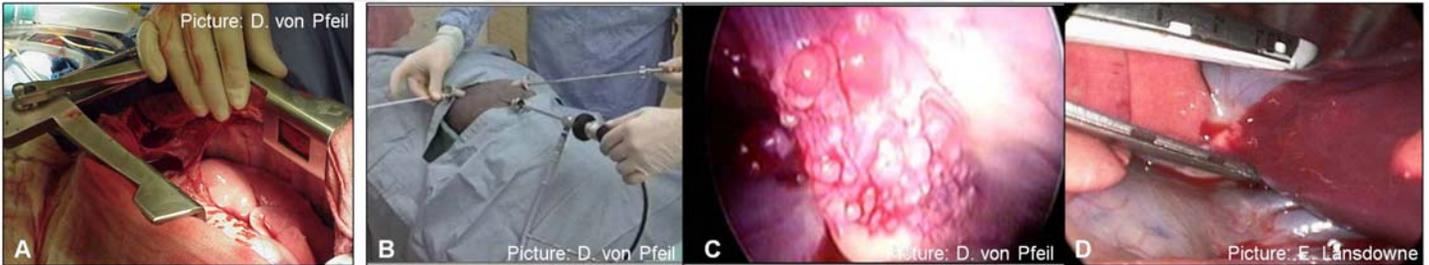
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Occasionally, laparoscopic inspection of the abdomen reveals that an open approach will be necessary to effectively treat the underlying disease. In these instances, your surgeon will convert to a traditional, open approach to complete the procedure.

### Thoracoscopy

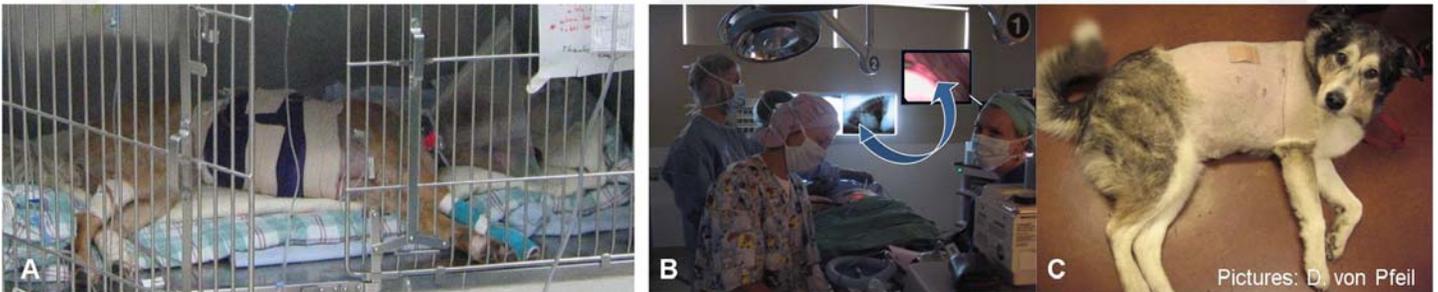
Thoracoscopy refers to the use of minimally invasive technology to evaluate the thoracic cavity.

This procedure allows inspecting and potentially treating abnormalities of the organs in the thorax (chest), such as lungs, heart, esophagus, and large vessels. It should only be performed by an appropriately trained and experienced veterinary surgeon (see our handout on “What is a board certified surgeon?”). During thoracoscopy, a small camera is introduced into the the thorax (chest). Thoracoscopic visualization of structures within the chest can aid in the diagnosis and, in some cases, allow treatment of many disorders. As with laparoscopy, thoracoscopy is much less invasive and therefore associated with less post-operative discomfort. One example of the application of thoracoscopy is to determine the extent of cancer in the thoracic cavity. Thoracoscopic evaluation can allow us to obtain a biopsy of the tumor, determine if the cancer has spread to lymph nodes, and to determine if the tumor can be surgically removed. When possible, we also use thoracoscopy to remove diseased lung tissue.



A: Standard open approach to the chest. B, C, D: Thoracoscopy to explore the chest. Note the difference in tissue damage using thoracoscopy compared to the standard open approach. C: Thoracoscopic view of chest wall disease. D: Close-up view of staple placement during thoracoscopic lung lobe removal.

One relatively common condition in dogs is pericardial effusion. This results in fluid filling of the pericardium, the sac that surrounds the heart. When this occurs, the pressure that develops interferes with heart function. For many of these patients, removal of the pericardium (pericardectomy) or creating a window in the pericardium is an effective treatment. This procedure can be done thoracoscopically, minimizing patient discomfort and recovery time. These advantages are why we try to use thoracoscopic procedures whenever possible.



A: Intensive post-operative treatment after an invasive chest surgery using an open approach. Note the large bandage and recumbent dog. B & C: Thoracoscopic lung lobe resection at Veterinary Specialists of Alaska. Note the small scars & content dog after surgery.

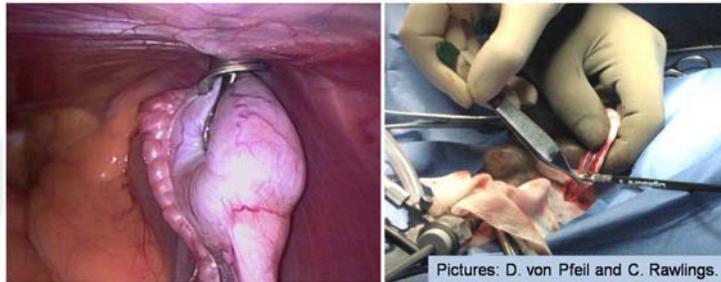


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### Summary: Minimally Invasive Surgery



Advantages of minimally invasive surgery is the less invasive approach.  
Left: Standard open approach. Right: Minimally invasive approach.



Excellent visualization of intraabdominal structures is possible with laparoscopy. This example shows removal of a retained testicle.



Specialized instruments are needed for minimally invasive surgery.  
Laparoscopy, thoracoscopy and arthroscopy (see handout on arthroscopy on our website) should best be performed by a trained small animal surgeon.



Please do not hesitate to call or ask at your next appointment if you feel,  
laparoscopy or thoracoscopy may be appropriate for your dog.