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A Review of Laparoscopic Surgery in Pet Animals: Applications and Results

Falah Mahmood Hameed

College of Veterinary Medicine, University of Kerbala , Kerbala , Iraq.
Corresponding author: falah.m@uokerbala.edu.iq

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***Abstract*— Laparoscopic surgery (LS), which offers major improvements in the treatment of abdominal disorders in pets, has grown to be an essential component of veterinary practice. Comparing this minimally invasive procedure to traditional open surgery, veterinarians may execute difficult surgeries with less tissue damage, fewer problems, and quicker recovery times. Laparoscopic ovariectomy, cryptorchidectomy, gastropexy, cystoscopy, and splenectomy are among the veterinary procedures that use LS; these procedures all benefit from improved visualization, less surgical trauma, and faster recovery after surgery. These benefits improve patient outcomes by lowering post-operative discomfort, reducing the requirement for pain treatment, and shortening hospital stays. The application of LS in small animal surgery has been significantly improved by the creation of specialized tools and cutting-edge imaging technologies. This study examines the many uses of laparoscopic procedures in veterinary medicine, emphasizing its advantages, results, and prospects for the future. According to the results, laparoscopic surgery is a safer and more effective option than open operations, and as it develops, veterinary surgery will likely see even more advancements.**

***Keywords* — General anesthesia, Laparoscopic Surgery, Applications, Pet Animals**.

INTRODUCTION

Veterinary surgery is a subspecialty of veterinary medicine that focuses on diagnosing, treating, and managing a variety of animal illnesses by surgical methods. With advancements in surgical techniques, instruments, and anesthetics, veterinary surgery has changed over time. Laparoscopic surgery (LS) is one of these surgical techniques and instruments that enables veterinarians to improved clinical outcomes for their patients and pets (1).

In medicine of veterinary, laparoscopic surgery is minimally invasive procedure that lets physicians to observe the internal tissues of the abdominal cavity with little harm, fewer complications, and a low death rate (2, 3). Patients typically have reduced hospitalization times when using current laparoscopic methods, which ensures faster healing and increases patient satisfaction (4). Laparoscopic surgery is thought to be less invasive than traditional open abdominal surgery and is thought to lessen the body's immunologic, metabolic, and neuroendocrine responses because to the minimal tissue damage (5,6). Additionally, another study found that animals receiving minimally invasive surgery (MIS) had significantly lower incidence of surgical site infections (SSIs) than mice undergoing open surgery (OS) (7).

Applications of Laparoscopy

Laparoscopic ovariectomy

A common procedure that many veterinary surgeons do as the first step in their laparoscopic practice is laparoscopic ovariectomy, and ovariohysterectomy. The advantages of using a minimally invasive laparoscopic approach as opposed to a traditional open style consist of better imaging and a shorter recovery period (8). Among the most prevalent clinical uses of surgical laparoscopy in bitches is ovariectomy. Laparoscopic ovariectomy, laparoscopic ovariohysterectomy, and, more recently, laparoscopically ovariohysterectomy for the treatment of canine pyometra are among the various laparoscopic procedures involving the reproductive tract that have been well-documented in canine clinical practice (8,9).

Laparoscopic crypt orchidectomy

According to reports, up to 10% of adult dogs have cryptorchidism, the most common genetic abnormality affecting the testes in dogs. Cryptorchidism, a congenital defect is usually unilateral, and the most often retained testicle is the right one (10). Using a fully laparoscopic or laparoscopically assisted approach, the diagnosis and treatment of abdominal cryptorchidism can be aided allows accurate localization of the retained testis and assessment of surrounding structures. Laparoscopic surgery offers distinct benefits over traditional surgery, including easier abdominal testicle location, shorter recovery times, and enhanced animal recovery. It is especially recommended to remove an abdominal testicle using a retrieval bag if testicular neoplasia is suspected (11).

Laparoscopic Gastropexy

Many gastropexy techniques, including fundic,

circumcostal, belt loop, incisional, and combining gastropexy, have been documented. Gastric fixation via gastrojejunostomy and gastrocolopexy are less common techniques. Because they are less intrusive and need less recovery time, minimally intrusive procedures such as endoscopic-assisted gastropexy, fully laparoscopic gastropexy, right-sided grid mini-laparotomy, and laparoscopic-assisted gastropexy have increased in frequency (12). is a preventative method intended to either stop gastric dilatation volvulus (GDV) from developing or stop it from returning after surgery (13). A new method known as laparoscopic gastropexy has emerged. This method uses access via a single port and telescopes and specialized tools that can bend and passage at different angles. Laparoscopic-assisted gastropexy is preferred by specific surgeons since it is theoretically straightforward and doesn't need any special tools away from a regular laparoscopic setup (14).

Laparoscopic Cystoscopy

A surgical procedure called a Cystotomy is a surgical procedure involving a deliberate incision into the urinary bladder. The most common reason for the surgery is primarily performed for removal of uroliths from the bladder or urethra. Other indications include correcting ectopic ureters, repairing ruptured bladders, and aiding in the diagnosis of bladder tumors (15). A laparotomy is typically used to do a cystotomy. Laparoscopic surgery can provide a good view of the urinary bladder, for the removal of calculi, laparoscopic-cystoscopy is a simple treatment that minimizes tissue damage that could result from a traditional laparotomy and cystotomy (16).

Laparoscopic splenectomy

Dog splenectomy is done for a number of diagnostic and therapeutic indications, such as immune-mediated illnesses, trauma, torsion, infarction, diffuse neoplastic disease, and benign and malignant splenic tumors. Prior to its widespread use in humans, laparoscopic splenectomy (LS) research, one of the earliest in human medicine, used canine and porcine prototypes to improve the technique (12). Splenectomy is commonly indicated in dogs presenting with splenic malignancies or hemoabdomen. To avoid a potential hemobartonella infection, it is also performed as an optional procedure on blood donor dogs. The outdated open splenectomy technique is being replaced with laparoscopic assisted (LA) splenectomy. Laparoscopic splenectomy had several benefits, including reduced invasiveness, morbidity, post-operative pain, hospital stay, and narcotic use (17).

Advantages

Veterinary procedures are now far more accurate, safe, and effective because of advancements in surgical techniques. Laparoscopy and arthroscopy are two examples of minimally invasive procedures that have grown in popularity because they minimize postoperative pain and speed up recovery. Furthermore, improved surgical results have been achieved with the development of enhanced imaging technologies, and specialized surgical equipment (18). One of laparoscopic surgery's main benefits for abdominal treatments of pets is the alleviation of pain following surgery. Large incisions may occasionally be required for traditional open abdominal procedures, which can seriously harm muscles and tissues and result of severe hurt and suffering through the healing process. Conversely, laparoscopic surgery causes less harm to the surrounding tissues since it only. Veterinarians can use less powerful medications and control pain more easily after surgery since there is less tissue damage. This is especially crucial for veterinary patients because it promotes faster recovery and improved postoperative outcomes, reducing patient discomfort and stress associated with prolonged recovery periods (19).

CONCLUSION

Particularly in the treatment of pets, laparoscopic surgery has significantly changed veterinary surgical procedures. Reduced tissue damage, a decreased risk of surgical site infections, a quicker recovery, and better patient outcomes are just a few advantages of its minimally invasive nature. Its adaptability and effectiveness are demonstrated by the vast range of applications, which include both regular procedures like ovariectomy and more complex surgeries like splenectomy and gastropexy. Ultimately, a significant step toward improving surgical accuracy, animal welfare, and the standard of veterinary care has been made with the introduction of laparoscopic techniques into standard practice.

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