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Endoscopy In Equine Respiratory Diseases

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Abstract

Endoscopy is a procedure which performed in order to view the inside of the body without performing surgical interference. Endoscopy was developed during the 1800's and is widely used in both human and veterinary medicine.

The endoscope can be either a rigid or fixed tube, it's consist of tube with a light at the end and an optical system or miniature video camera for transmitting an image to the examiner's eye. Endoscope is widely used in developed countries but it is almost not used in the less developing countries. study .

Endoscopy is one of the most diagnosis, treatment and prognosis useful tools available in equine practice. It allows the practitioner a minimally invasive technique in examining different organ . We hope that this study will help illustrate the usefulness of diagnostic endoscopy. Therefore the Selection an endoscope for equine respiratory endoscopy depended on the length and diameter of the endoscope, fiberoptic videoendoscopies and type of the light sources used the special respiratory diseases including diseases of the nasal cavity, pharynx, guttural pouch, larynx, epiglottis, trachea and bronchi.

The uses of endoscopy in veterinary practice has become commonplace over the last decade, such that almost every practice dealing with horses now owns a arigid, flexible, fibreoptic or video endoscope. The equine upper and lower respiratory tract suffers a huge array of disorders and therefore not surprisingly, the vast majority of endoscopy in equine clinical practice concerns examination of the respiratory tract

The importance of endoscope is become from fact, in which it is a diagnostic method used to help the veterinarian to diagnose the disease, especially those diseases of respiratory system, digestive system and urinary system. So it is a satisfying way for diagnosing, more over

Endoscopy is an advanced diagnostic technique . It is widely used in developed countries, but it is almost not used in the less developed countries, unfortunately our country is one of them , therefore we decided to study this technique

Keywords: the respiratory diseases / Endoscopy/ in equine veterinary medicine

1- Introduction

Definition:-

An Endoscopy is a simple procedure which allows a doctor to look inside bodies using an instrument called an endoscope. The endoscope is a tube with a camera and light on the tip. The endoscope itself can either be a rigid or flexible tube. Rigid tubes are used primarily to visualize the colon/rectum, nasal passages. [3]Flexible tubes can be used to visualize the intestinal tract (upper and lower)or airways . In some situations, both a flexible and rigid scope may be used for airways examination[12]

Endoscopy is also very useful in collecting samples for histopathology (biopsy testing) and can even guide in therapy and repair. endoscopes which have applications in dogs, cats, and exotics. Another example of this is the endoscopic-assisted prophylactic gastropexy[16]. This is a procedure designed to prevent deadly stomach twisting (often referred to as “bloat”) in large breed dogs like Shepherds and Great Danes. The uses of endoscope to find the perfect location on the stomach[1] .

History:-

Endoscopy was first described by Hippocrates in Greece (460-375 BC). He was the first to make reference to a rectal speculum. At the same time the first simple speculum for gynecological endoscopy has emerged. a three-bladed vaginal speculum was found in Pompeii's ruins (70 AD), this instrument was similar to the modern vaginal speculum. [2].Endoscope was developed in 1806 by Philipp Bozzini in Mainz with his introduction of a "Lichtleiter" (light conductor) "for the

examinations of the canals and cavities of the human body". An endoscope was first introduced into a human in 1822 by William Beaumont , an army surgeon at Mackinac Island, Michigan whereas laparoscope was first used for Laparoscopic examination by sir Frederick hobday in dogs during 1902 as citation in [6]. More over Georg Wolf found an electric light endoscopes, which established in 1906, also Sussmann was produce the flexible gastroscope, which previously external light have been used. After that a smaller bulbs became available and making internal light possible,

for instance in a hysteroscope by Charles David in 1908 [29]. Fernando Alves Martins of Portugal invented the first fiber optic endoscope during 1963 , such instrument was used of hot bulb in the abdomen, also major technological change in optic endoscope was established as well as optic videocamera in 1980, that allowed major advance in diagnostic and surgical[20].

Endoscopy for Veterinary is about 100 years old. The first endoscopic examinations were reported back in 1902 [11]. From it was still a long way from being an accepted treatment and examination method. By improving the endoscopic technology the number of minimal invasive incisions and examinations in the veterinary field grew over the decades continuously [22].

2- Endoscopic Instrumentation

Endoscopic instrumentation including rigid endoscopes all rigid endoscopes are a solid metal tube with a series of lens inserted in the tube. There are a few different methods for these, but the principle is the same. Light is delivered through the endoscope using fibre optic bundles around the outside of the lens housing. These endoscopes do not bend, but will give the user the highest resolution images [14]. While flexible endoscopes as the name suggests, you can bend these! The principle optical component is either a plastic or glass fibre bundle for delivery of the image, plus additional fibres for the light. These are still quite delicate and easy to break and quite expensive to repair. [17], but the fiberoptic endoscope principles a fiberoptic endoscope system is based on transmission of

light and images through long thin fibers of optical glass. The fiberoptic image is made up of thousands of tiny fibers that are made of coated glass [27], also video endoscope principles video endoscopy has been used in human medicine for several years and has just recently become widely used in equine medicine for both diagnostic and therapeutic procedure [18].

3- Accessories:-

Accessories of endoscopy comprise the biopsy and grasping forceps, it's **the** various styles of forceps and graspers that are available for passage through the instrument channel [15]. And the guttural pouch probe is a no traumatic tipped guide wire that facilitates easy navigation of the guttural pouch. When inserted through the scope and into the pouch, the probe enables the clinician to slide the scope forward over the wire into the guttural pouch. [26]. Also the various catheters for flushing and aspirating fluids are available.

Simple aspiration catheters made of Teflon normally come in two sizes: 1.8-mm or 2.4-mm diameter. The length of these catheters is 240 cm, and they will fit any scope with a 220-cm or shorter working length. it is including:-double-guarded tracheal aspiration catheter, simple aspiration catheter, lance catheter and guttural pouch catheter[9].In addition to the needles range in diameter and length; the most popular size is the 17-gauge needle with a 1-cm length[8].When using cleaning supplies, always follow the manufacturer's cleaning instructions outlined in your equipment's specific instruction manual. [7] As well the leak tester is the most important accessory item for use with the endoscope. The best way to protect your investment is to perform a leak test on your scope after every use or before use in a procedure if the scope has been in storage for a long time[19].Aside from channel-cleaning brushes come in various sizes and are available in reusable and disposable versions[11]. But in the New endoscopes always come with a standard set of cleaning accessories that include the cleaning brush and a channel-flushing kit. Most kits provide a syringe method for flushing fluids through the channel during cleaning and disinfection[24].

Types rigid endoscopy: The rigid endoscopy consist of Arthroscopy: an exam of soft tissue structures and joint cartilage. Cystoscopy: an examination of the vagina, urethral opening, urethra, bladder. Laparoscopy: an exam of the abdominal cavity performed through a small incision in the wall of the abdomen or through the navel. It is done in veterinary medicine to obtain hepatic (liver) and renal (kidney) biopsy samples. Proctoscopy: an exam of the large bowel and rectum. Rhinoscopy: an exam of the nasal cavity and nasopharynx (junction between the nasal area and the back of the throat). Thoracoscopy: an examination of the chest cavity. This is currently not performed frequently in veterinary medicine. Nevertheless the flexible endoscopy Type consistence Bronchoscopy an exam of the lower airways. Colonoscopy an exam of the transverse colon, ascending colon, cecum, large bowel, and rectum. And endoscopy an exam of the esophagus, stomach, and upper intestines [30]

Selecting an endoscope for equine respiratory endoscopy including length and diameter of endoscope A wide variety of endoscopes are available for examination of the equine respiratory tract; an endoscope with a small diameter (7–9 mm) will allow examination of the nasal meatuses, the guttural pouches and the airways of foals or small ponies. the trachea for collection of respiratory secretions in adult horses (approximately 100–110 cm) is ideal. Longer endoscopes (>160 cm) are required for bronchoscope or for collection of broncho-alveolar lavage fluid from adult horses. [25]. While fiberoptic videoendoscopes these are two systems differ in the way that images are collected and transmitted to the eyepiece or monitor. Fiberoptic images are transmitted from the subject, through long thin fibers of optical glass, into a magnifying eyepiece. Videoendoscopes provide a higher quality image than do fiberoptic endoscopes but are

more expensive. Videoendoscopes produce an image at the objective lens at the distal tip of the insertion tube (the portion of the scope that is inserted into the patient). [26]. And the last halogen ‘cold’ light sources are the most commonly used for equine respiratory endoscopy and are available as compact and light units [21].

Maintenance of endoscopes when you need to maintained we should cleaning and

disinfection, The endoscope should be cleaned thoroughly after every endoscopic examination to minimize cross-contamination of pathogenic microbes between horses. After endoscopically manufacturers of endoscopes provide cleaning instructions in their manufacturer's manual that should be strictly adhered to both the external surface of the endoscope and the air/water and biopsy channels should be cleaned and flushed after every procedure[23]. We don't forgot the sterilization that including by immersion in 2% gluteraldehyde solution for several hours[28].

Values are mean and standard error of mean. *The mean difference is no sig

4- Procedures of endoscope:-

The endoscope examination of the respiratory tract of the horse begins by passage of the flexible endoscope through the external nares or nostril, in similar fashion to passing a stomach tube for drenching a horse. Past the nostril, the nasal cavity is entered which is partially divided by soft bones called turbinate bone. Toward the back of the nasal cavity a slit like opening is visible which open in to the sinus. This opening is adjacent to an intricate structure known as the ethmoturbinate bone. On further passage of the endoscope the pharynx is entered. Up to entry in to the pharynx the left and right nasal passages of the are separated by a bone / cartilage septum. [4]The pharynx is where the oral cavity and respiratory tract unite. The soft palate is a muscular membrane that channels airflow between the nostrils and larynx and combined with the epiglottis enable food material and water to be swallowed without risk of inhalation. The openings of the two guttural pouches are visualized within the pharynx. In some cases, direct visualization within these pouches may be indicated. Lymphoid tissue on the roof of the may be assessed.

The arytenoid cartilage open to enable maximal airflow to the lung during exercise. Fluctuating pressures within the airway, generated by intense exercise may cause partial collapse of soft tissue structure in this area. Resulting turbulent intense exercise may causes respiratory noises and in severe cases exercise tolerance may be affected. [13]

Passage of endoscope through the larynx in to the trachea is well tolerated in the horse. The trachea courses caudally along the neck to enter the chest. Within the chest ,the trachea becomes almost horizontal for a portion creating a natural area for discharges (mucus, pus, blood) from the lung to accumulate. [10]A coughing horse may cause (splattering) of these secretion over the trachea or material may collect in a pool before being cleared by cilia. Secretions are then either removed from the respiratory tract by swallowing or as nasal discharge. The endoscope may be passed to the carina where the trachea divides in to the two major bronchi within the lung. Further entry to the lung is not usually performed because this area is very sensitive.[20]. Secretions from the lung and trachea may be obtained using the biopsy channel of the endoscope. Broncho-alveolar lavage or (lungwash)is a technique for sampling cells that line the very small bronchioles and alveoli. This may be performed via the endoscope or more commonly via a special Broncho-alveolar lavage tube. Analysis of cell retrieved by this technique is very useful in detailed investigation of diffuse lung disease.Broncho-alveolar lavage is performed in the standing sedated horse.[5].

5- Conclusions

Endoscope is a safe technique and widely used for examining any organ of the body , also it can used to diagnose and treat medical problem of the respiratory disease such as disease of the nasal cavity, pharynx, guttural pouch, larynx, epiglottis, trachea and bronchi. Endoscopy allows better diagnosis than other technique because it is not needed to surgical interference.

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