

COMPARATIVE STUDY ON LAPAROSCOPIC STERILIZATION TECHNIQUES IN DOGS

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ABSTRACT

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A total of 12 female dogs presented at TVCC, NVC, Nagpur were included in this study and were divided into 2 different groups of 6 dogs each. The dogs were subjected to laparoscopic ovariectomy and laparoscopic ovariohysterectomy in group I and II, respectively. The surgical parameters like surgical operating time, time to resect left and right organs and length of incision were studied. The mean surgical time of 71.16 ± 3.08 minutes was recorded in group I than that of 60.66 ± 5.60 minutes in group II. The time for resection of left ovary was longer in laparoscopic ovariectomy (26.66 ± 2.53 minutes) than by laparoscopic ovariohysterectomy (20.66 ± 3.02 mins). The time for resection of right ovary was longer in laparoscopic ovariectomy (18.83 ± 2.42 minutes) followed by laparoscopic ovariohysterectomy (14.33 ± 2.71 mins). Ovarian pedicle bleeding and splenic puncture in one dog were the intraoperative complications recorded in the study. It could be concluded that both the techniques were found equally feasible and safe for patients and further that surgical time can be reduced with experienced and skilled surgeons.

Key words: Laparoscopic, ovariectomy, veress needle, pneumoperitoneum

Introduction

Minimally invasive surgery, especially laparoscopic surgical techniques are gaining popularity in veterinary field due its advantages of less surgical trauma, less postoperative pain, less hospitalization duration and rapid return to normal activities (Mayhew, 2011). The overgrowth of dog population can be controlled by the sterilization. Laparoscopic surgery can provide a promising approach in sterilization of such stray dog population where in the dogs can be released in 3 days without problems like wound dehiscence, haemorrhage, infection, maggots infestation etc (Mahalingam *et al.*, 2009).

Materials and Methods

A total of 12 female dogs presented at Teaching Veterinary Clinical Complex of Nagpur Veterinary College, Nagpur were included in this study and were divided into two different groups of 6 dogs each, group I and group II. Group I dogs were subjected to laparoscopic ovariectomy whereas group II dogs were subjected to laparoscopic ovariohysterectomy. Butorphanol at the dose rate of 0.2 mg/kg body weight was given intravenously and after a delay of 4 minutes dexmedetomidine 3 mcg/kg body weight was administered intravenously. Six minutes thereafter general anaesthesia was induced with propofol at 4 mg/kg body weight intravenously, injected slowly over a period of 60 seconds. The depth of anaesthesia was maintained with continuous rate infusion of propofol at the dose rate of 0.2 mg/kg/min (Group A1) and 0.3 mg/kg/min (Group A2) in equal number of dogs in each group with infusion pump 5 minutes post induction.

After the anaesthetic induction the dogs were placed in trendelenburg position and pneumoperitoneum was achieved by veress needle insertion and maintaining the CO₂ pressure at 12 mmHg. A 5 mm 0 degree telescope (Karl storz) was inserted at 2 cm above the umbilicus and used for examination of the abdomen and for guiding the placement of ports. Two paramedian working ports were placed for conducting the laparoscopic procedures.

Similar procedure for port placement was also reported by Khandekar (2011), Pawar (2013), Niranjana *et al.* (2013) and it was found suitable for this study. The resection of organs and the haemostasis was achieved by the electrocoagulation. The surgical parameters like surgical operating time, time to resect left and right organs and length of incision were studied.

Results and Discussion

The mean surgical time of 71.16 ± 3.08 minutes was recorded in group I whereas 60.66 ± 5.60 minutes in group II. The mean total surgical time of 42.66 ± 1.62 minutes and 120 minutes to perform laparoscopic ovariohysterectomy was reported by Kandpal (2013) and Davidson *et al.* (2004), respectively in dogs. Whereas, Alves *et al.* (2012) reported 85 minutes surgery time to perform laparoscopic ovariohysterectomy in a 15 year old bitch suffering from open pyometra. Ruiz *et al.* (2008) performed laparoscopic ovariohysterectomy in 20 female dogs in an average time of 65.55 minutes (30-120 mins).

Niranjana *et al.* (2013) in their comparative study of port placement (3 ports or 2 ports) models and ovarian haemostasis techniques (endoclip or electrocautery) recorded minimum mean time of 85 ± 7.75 and maximum of 88.67 ± 7.13 minutes in female dogs undergoing laparoscopy assisted ovariohysterectomy, whereas, Berenjjan *et al.* (2010) reported mean times for laparoscopic ovariohysterectomy as 37.5 ± 5.56 and 37.0 ± 3.24 minutes in dogs undergoing comparative study on use of mono and bipolar electrocautery, respectively.

Prolonged surgical time is inherent in the laparoscopic techniques and often regarded as a disadvantage (Collard and Viguier, 2008). Surgeon skill and experience influence the time to successfully complete laparoscopic surgeries. At the same time dogs with more fat deposition took more time for cauterization, increasing the fumes within the peritoneal cavity, which, required opening of the vent in cannula for faster removal of fumes. This process of venting out fumes and maintenance of insufflation too

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added to the total time of surgery.

Time to resect left or right ovary was recorded as the time from the grasping of ovarian bursa to complete removal of resected organ from abdomen in group I whereas, in Group II the time from grasping to complete detachment of left ovary from ovarian pedicle was recorded. Similar time was noted for the right ovary. The time for resection of left ovary was longest in group I (26.66 ± 2.53 minutes) followed by group II (20.66 ± 3.02 mins) and Group III (18.83 ± 2.37 minutes) Dupre *et al.* (2009) recorded approach time (from trocar insertion to grasping) and left ovariectomy time as 3.20 ± 1.24 ; 2.23 ± 1.34 minutes and 5.03 ± 2.38 ; 4.21 ± 2.42 minutes in single and two port laparoscopic ovariectomy, respectively when performed by experienced surgeon.

The time for resection of right ovary 18.83 ± 2.42 minutes was in laparoscopic ovariectomy and 14.33 ± 2.71 minutes in laparoscopic ovariohysterectomy. In the present study the time required for resection of left ovary was more than the time required for resection of right ovary. However, there was no significant difference between both the laparoscopic procedures.

Silva *et al.* (2015) reported mean time to approach and resect right ovarian pedicle to be 3.5 ± 2.1 , 3.9 ± 1.0 and 4.1 ± 1.6 minutes in bitches subjected to total transvaginal, single port laparoscopic assisted and conventional ovariohysterectomy. Total durations of surgeries were in the range of 25-34 minutes.

The mean lengths of incisions were 0.98 ± 0.04 cms and 0.95 ± 0.04 cms in Group I and II respectively. There was no significant difference in the length of incision between both the groups. Although the length of incision during port placements in laparoscopic surgeries are limited to the size of the working ports (5-6 mm), it was found necessary to extend the initial incision to facilitate removal of resected organs. Ovarian bursa with high fat content required extension of incisions, whereas small size organs could be retrieved through the working ports and thereby did not require any extension of the primary incision. Adamovich-Rippe *et al.* (2013) increased the incision to 3-4 cms for insertion of a wound retraction device via caudal portal to simplify removal of the uterus with minimum tension. Post incision enlargement is occasionally required for retrieving the uterus from the abdominal cavity, due to enlarged adipose ovarian pedicles and bursa (Silva *et al.*, 2015 and Hancock, 2005).

Irrespective of the sterilization technique used, the length of incision ranged from 0.75 to 1.13 cms for laparoscopic procedures. Shariati *et al.* (2014) and Dupre *et al.* (2009) reported total length of incision to be 5 mm and 10 mm in a 2 port laparoscopic ovariectomy. In contrast Culp *et al.* (2009) recorded incision length of 3.5 mm and 6 mm only.

The mean time of the dogs returning to normal function were 3.5 ± 0.42 hours in group I and 3.33 ± 0.21 hours in group II. There was no significant difference observed between the groups. Ovarian pedicle bleeding and splenic puncture in one dog were the intraoperative complications recorded in the study. It could be concluded that both the techniques were found equally feasible and safe for patients and further that surgical time can be reduced with experience.

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