ABSTRACT

The aim of this study is to describe a spay hook minimally invasive ovariohysterectomy (OH) technique in domestic cats and to report 276 consecutive cases. A total of 276 OH procedures were performed in clinically healthy cats using minimally invasive techniques. All surgeries were performed according to the initial proposal without observing any intraoperative complications. The average time of less invasive OH procedure was 11.4 minutes. Less handling, and shorter surgical and anesthetic times decreased the total cost of the surgery and the risk of complications for the patient, both during surgery and in the postoperative period. Therefore, the less invasive OH technique, using a spy hook, has multiple advantages when incorporated into the veterinary surgical routine.

Keywords: OHE, feline, abdominal surgery, castration, celiotomy

RESUMO

O objetivo principal deste estudo é descrever a técnica de ovarioalpingohisterectomia (OH) minimamente invasiva com gancho em felinos domésticos e relatar 276 casos consecutivos. Um total de 276 procedimentos de OH foram realizados em gatas clinicamente saudáveis utilizando-se técnicas minimamente invasivas. Todas as cirurgias foram realizadas de acordo com a proposta inicial, sem observar complicações intra-operatórias. O tempo médio de procedimento foi de 11,4 minutos. Menor grau de manipulação cirúrgica e menores tempos cirúrgicos e anestésicos diminuíram o custo total da cirurgia e o risco de complicações para o paciente, tanto durante a cirurgia como no período pós-operatório. Dessa forma, pode-se concluir que a técnica de ovarioalpingohisterectomia minimamente invasiva utilizando o gancho de castração tem múltiplas vantagens quando incorporada na rotina cirúrgica veterinária.

Palavras-chave: OSH, felino, cirurgia abdominal, castração, celiotomia
INTRODUCTION

Ovariohysterectomy (OH) is one of the most common surgical procedures in veterinary medicine. The main objective of OH is to act as a contraceptive method, although it may be indicated for the treatment of some diseases of the female genital system, such as pyometra, and uterine and ovarian cancer (COE et al., 2006, SCHIOCHET et al., 2007). OH also reduces the risk of developing breast cancer and other conditions of the reproductive system (LANA et al., 2007) in bitches and cats.

Less invasive surgical approaches have gained remarkable space in veterinary medicine today. They have many advantages and benefits such as reduced risk of dehiscence and bleeding, reduced pain and wound complications in the postoperative period, and shorter hospitalization time, thus lowering procedure costs and animal stress (ELLEN et al., 2004).

The laparotomy performed with the help of video-surgery was initially used for reproductive research, as well as to visualize, explore and perform biopsy in abdominal structures for diagnostic purposes. Laparotomy causes less trauma to tissues, less discomfort and pain in the post-operative, faster post-surgical recovery, lower costs and animal stress (ELLEN et al., 2004).

Different techniques have been described for sterilization of bitches with minimally invasive incisions without the help of video surgery (MIGILARI e VUONO, 2000; PUKACZ et al., 2009). Such techniques enable faster recovery, lower rate of postoperative complications and an early return to normal function, without the need for expensive surgical equipment (PUKACZ et al., 2009).

There are several sterilization techniques being performed in different centers around the world. In some procedures, the OH or ovarioectomy is performed though the ventral midline while in others access is through the flank (HOWE, 2010). Regardless of this fact, retrospective analyses show no significant difference in the rate of stump pyometra, urinary incontinence and other complications when performing different techniques (VEENIS et al., 2004; COE et al., 2006; VAN GOETHEM et al., 2006; WHITEHEAD, 2006).

The incidence of complications varies according to the surgeon’s experience and pre-operative (JOHNSTON, 1991; ZAUNBRECHER;SMITH 1993) risk factors. The number of routine sterilization procedures performed in bitches and cats is large, and therefore, many complications have been described, such as bleeding, complications during healing, remaining ovary syndrome (CAMPBELL, 2004; HEFFEFINGER, 2006), stump pyometra (CAMPBELL, 2004), granuloma formation (KANAZONO et al., 2009; DEMERIEL e ACAR, 2012), constipation (COOLMAN et al., 1999), urethral trauma (KYLES et al., 1996; COPEGUL et al., 1999; MEHL e KYLES, 2003; KANAZONO et al., 2009), vaginal- peritoneal fistula (FRANK e STANLEY ,2009), Enterocutaneous fistula (FRANK e STANLEY, 2009), urinary incontinence (ARNOLD et al., 1989; STOCKLIN-GAUTSCHI et al., 2001) and bowel strangulation (KUAN et al., 2010). However, despite these complications, compared with conventional surgical technique, the minimally invasive technique offers greater security and other benefits such as reduced pain and risk of wound complications in the postoperative period, less dehiscence and bleeding, thus reducing hospitalization and recovery periods (ELLEN et al., 2004).

This study aimed to describe trans and postoperative outcomes of laparotomy OH technique in cats, recording the anesthetic and surgical procedure time. Additionally, we aimed to report 276 consecutive cases.

MATERIAL AND METHODS

The OH procedure was performed in 276 cats, of different races, weighing 2.5 ± 0.6 kg average, minimum age of three months, clinically evaluated and considered healthy. The cats were seen at the clinical and surgical care of the Teaching Hospital of São Paulo State University, in Botucatu, São Paulo, Brazil. The same surgeon performed all surgeries. Ethics committee approved this study previously starts (20/2008).

After food fasting for 12 hours and water fasting for 2 hours, the animals were premedicated with ketamine (7.5 mg/kg) and medetomidine (80 µg/kg) intramuscularly. Anesthesia was induced with propofol (3 mg/kg IV) and, immediately, patients were maintained with isoflurane diluted in 100% oxygen. All animals received continuous infusion of Ringer’s lactated solution (10ml/kg/h IV). Subsequently, the animals were positioned supine and the ventral abdominal region submitted to trichotomy and previous antisepsis with chlorhexidine 2%. After final antisepsis with chlorhexidine 0.5%, a skin incision of approximately 1 cm was made in the midline of the umbilical retro region (approximately 3 cm below the umbilicus). The abdominal cavity was entered through a linea alba incision. A spay hook was used to draw up the ovaries and their respective pedicles, which were sutured using a 3-0 nylon monofilament. The uterine body was then elevated above the level of the skin incision and sutured right above the cervix using 2-0 nylon monofilament. The synthesis of abdominal suture was performed with Sultan type stitches. The subcutaneous tissue was closed with a simple continuous suture and the skin with individual simple stitches, using a 3-0 nylon monofilament. All animals received a single dose of cephalothin (30mg/kg IV) 15 minutes prior to surgery, and meloxicam (0.025 mg/kg IM) after the surgical procedure.

All animals were monitored during the surgical procedure using a multiparameter monitor. The cats were seen again 10 days after surgery for removal of
Surgical time (ST) was measured from the skin incision to the completion of the final suture stitch while anesthetic time (AT) was measured from induction of anesthesia until extubation.

RESULTS

There were no complications during the period of anesthesia and surgery in all animals involved in the experiment. The animals were followed until the return ten days after surgery and at this time the stitches were removed.

Before the surgical procedures, hematology and biochemical tests collected from all animals of the experiment were normal. If there were any changes, the animal was removed from the study. During surgery if there were changes in the reproductive system, the animal was removed from the study as well. There were no anesthetic complications during the procedure.

The ST ranged from 5 to 35 minutes, with an average of 13.4 ± 6.3 minutes. The cats who were obese had higher surgical time owing to difficulties in finding the uterus with the hook. The average AT was 20.7 ± 12.4 minutes.

On the tenth day after the surgical procedure the stitches were removed. Two cats had suture loss and a new suture was performed.

DISCUSSION

Routine neutering of healthy female dogs and cats is one of the most frequent surgical procedures in veterinary practice. Traditional ovariohysterectomy involves removal of the ovaries and uterus through a midline celiotomy (HOWE 2006; PUKACZ et al., 2009).

Complications associated with a conventional open ovariohysterectomy is widely described. They are often result from inappropriate technique while performing the procedure and include hemorrhage, ovarian remnant syndrome, stump pyometra, stump granuloma, fistulous draining tracts, accidental ureteral ligation, and urinary incontinence (HOWE 2006). Burrow et al. (2005) reported 20.6% of complications after 142 conventional procedures in bitches.

Less invasive procedures have several advantages compared to conventional surgical methods, among them, less surgical trauma, reduced anesthetic time, and lower material consumption throughout the procedure (MIGLIARI e VUONO, 2000; PUKACZ et al., 2009).

Due to the large number of OH cases in clinical and surgical routine, several techniques have been described in order to minimize surgical time and reduce trans and postoperative complications. Among them, most are performed by celiotomy (PUKACZ et al., 2009).

The literature shows that video-assisted techniques are not routinely used in veterinary due to the cost of equipment, training of surgeons, staff required and longer surgical time (PUKACZ et al., 2009).

In the present study, 276 small incision celiotomy OH procedures were performed always by the same surgeon without intra-operative accidents. There were no problems worthy of note while performing the procedure.

Ovarian pedicles were easily externalized and clamped with hemostats, which is consistent with reports by Hedlund (2008). However, Malm et al. (2004) stated that it is difficult to draw up the ovarian system through small incisions in obese bitches.

The ST ranged from 5 to 35 minutes, with an average of 13.4 ± 6.3 minutes. These shorter time results are better than those found in the literature with respect to the time needed to perform the conventional OH procedure (EUGSTER et al., 2004; BURROW et al., 2005). Coo et al. (2006) also reported, on a retrospective study, average time longer than 40 minutes to perform the OH through the midline and the flank. Pukacz et al. (2009) reported average 59 minutes to perform the minimally invasive procedure in dogs. This difference may be related to the smaller size of felines in relation to canines and the fact that two incisions were performed for the OH.

Another advantage of the small incisions for celiotomy OH is the reduced risk of infection, since the chances of intraoperative contamination increase as the surgical time also increases (HANCOCK et al., 2005). However, a shorter surgical procedure entails no difference regarding postoperative pain (KIM et al., 2011).

Kim et al. (2011) performed ovarietomy via laparoscopy in 17 cats. Furthermore, the mean operative time was 23 minutes with three cuts to insert the surgical apparatus. The surgical procedure in this study stands out because it requires shorter time, smaller surgical apparatus and only one incision. By contrast, Hancock et al. (2005) reported that the laparoscopic OH in dogs causes fewer postoperative pain and stress compared to conventional techniques. However, there are no studies comparing postoperative pain between OH laparoscopic and minimally invasive conventional techniques in cats.

The average AT was 20.7 ± 12.4 minutes. Because of speed and practicality of the small incision surgery, the TA was considerably reduced when compared to traditional procedures and the laparoscopic approach (COE et al., 2006; SCHIOCHET et al., 2007; PUKACZ et al., 2009). Eugene et al. (2004) reports that shorter anesthetic time is directly related to lower risk of infection and less inflammation in the postoperative period compared to the more lengthy procedures.

All animals were evaluated 10 days after the surgical procedure and were normal, however the owners were instructed to return after this period if there were any complications. Kuan et al. (2010) reported a postoperative intestinal twist 14 days after the cat was spayed through a minimally invasive surgery, 60% bowel resection had to be performed. The author attributed this complication to...
the probable misuse of the spay hook.

The less invasive celiotomy OH proved to be an effective and safe technique, shortening the surgical and anesthetic time, reducing the total cost of the surgery, making it more accessible and showing that it can be performed as a surgical routine and especially in mass sterilization campaigns.

CONCLUSIONS

Currently, there are several surgical techniques for sterilizing females. These techniques always present as an end result, the sterilization of the animal, but it is up to the surgeon to think not only of the end result, but rather to seek the welfare of the animal, choosing, therefore, the less invasive, faster and safer procedure. The small incisions celiotomies technique reduces total cost of surgery and the risk of complications for the patient, both during surgery and in the postoperative period.

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