



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2020; SP-9(7): 191-193

© 2020 TPI

www.thepharmajournal.com

Received: 01-05-2020

Accepted: 03-06-2020

Vigneswari Murugesan

PG Scholar, Department of Veterinary Surgery and Radiology Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) Namakkal, Tamil Nadu, India

Kumaresan Arunachalam

Assistant Professor and Head, Department of Veterinary Surgery and Radiology Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) Orathanadu, Thanjavur, Tamil Nadu, India

Kathirvel Shanmugam

Professor and Head, Department of Veterinary Surgery and Radiology Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) Namakkal, Tamil Nadu, India

Mekala Palanivel

Assistant Professor, Department of Veterinary Pharmacology and Toxicology, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) Namakkal, Tamil Nadu, India

Corresponding Author:

Vigneswari Murugesan

PG Scholar, Department of Veterinary Surgery and Radiology Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) Namakkal, Tamil Nadu, India

Comparative study on midline and lateral flank approaches for ovariohysterectomy in cats

Vigneswari Murugesan, Kumaresan Arunachalam, Kathirvel Shanmugam and Mekala Palanivel

Abstract

The aim of the study was to compare the surgical approaches on postoperative wound complication following ovariohysterectomy. Forty healthy queen cats with the age group of two to three years and weighing two to four kilograms were selected for the study. The animals were randomly assigned into two treatments comprising of twenty animals each: I- lateral approach or II - by midline approach. All animals received dexmedetomidine (10µg/kg) and ketamine (5mg/kg) with butorphanol (0.2mg/kg) by intramuscular route and maintenance of anaesthesia was carried out with isoflurane. Ovariohysterectomy was performed in all the animals through right flank or midline approach as per standard surgical procedure. There was a greater incidence of swelling and discharges in the cats spayed through the lateral flank (five cases) than in the cats spayed through the midline (three cases) but no significant difference between the surgical approaches. Postoperative pain score using simple descriptive scale was found effective for assessing analgesic intervention level.

Keywords: Ovariohysterectomy, cats

Introduction

Ovariohysterectomy (OHE) is one of the most common surgeries performed in cats. It is commonly carried out either through a midline or lateral flank approach. Besides reproductive control, the surgical procedure is indicated in cases of pyometra, metritis, dystocia, mammary tumours and reproductive disorders. In cats, signs of oestrus such as increased vocalization, rolling on the ground and a very short inter-oestrous interval can negatively influence the relationship between cat and the owner, which prompts the owner to seek a method of reproduction control Oliveria *et al.*, (2014) [1].

Surgical trauma is associated with activation of the sympathetic-adrenal axis, with consequent breakdown of homeostasis and increased recovery time. Thus, less invasive techniques are being incorporated into the veterinary practice to enable better surgical recovery Oliveira *et al* (2014). Surgical methods where the gonads are removed, are ovariectomy (OVE) or ovariohysterectomy (OVH), through the linea alba or through the flank or laparoscopy (Davidson *et al.*, 2004 and Devitt *et al.*, 2005) [6, 7].

The ventral approach, which is most widely used, has some advantages and disadvantages. Midline approach is preferable, predominantly because the uterus sometimes cannot be identified from the flank approach, and it is difficult to be certain whether this is a technical problem or the cat has already been neutered, without exploring from a midline approach. Certain rare congenital abnormalities, such as uterus unicornis, may also be difficult to identify or deal with from the flank approach. With the flank approach, if the ovarian or cervical pedicles are lost before they are ligated, they may be difficult to recover (Coe *et al.*, 2006) [5].

Conditions for which the lateral flank approach for OHE is indicated include excessive mammary gland development due to lactation or mammary gland hyperplasia. When it is necessary to perform an OHE on a lactating animal, using the lateral flank approach can avoid potential complications that may be associated with the ventral midline approach, such as excessive hemorrhage from the skin and subcutaneous tissue, wound inflammation or infection and leakage from mammary tissue. In addition, using the lateral flank approach in lactating animals minimizes disruption to the mammary glands so that animals are more likely to continue nursing appropriately after surgery (Holly and Hardie, 2004) [3].

Advantages of the lateral flank approach for OHE include the ability to observe the surgical wound from a distance and reduce potential for evisceration if wound dehiscence occurs (Holly and Hardie, 2004) [3].

The present study was designed to compare flank and midline approaches in cats for ovariohysterectomy.

Materials and Methods

This work involved the use of client-owned animals only and followed individual clinical patient care. Ethical Approval from a Committee was not therefore needed. Informed Consent in a written form was obtained from the owner of all animals described in this work for the procedures undertaken. The study was conducted in forty apparently healthy queen cats subjected for ovariohysterectomy at Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the mean \pm SD body weight of 2.75 ± 0.85 kg. Food was withheld for 12 hours and given free access to water prior to anaesthesia. The selected cats were randomly divided into two groups comprising of twenty animals each. The animals were randomly assigned to two treatments comprising of twenty animals each: I- ovariohysterectomy by lateral approach (LA) or II - by midline approach (MA). All animals received dexmedetomidine ($10\mu\text{g}/\text{kg}$) and ketamine ($5\text{mg}/\text{kg}$) with butorphanol ($0.2\text{mg}/\text{kg}$) by intramuscular route and maintenance of anaesthesia was carried out with isoflurane.

The clinical appearance of wound was assessed after 7 days post surgery and were scored as none, mild, moderate and severe based on appearance of wound/ gross changes (swelling, excessive licking, dehiscence and discharge) and complications (evisceration, hernia and wound breakdown). The total pain score was recorded at 1, 2, 5, 12 and 24 hours postoperatively in both the groups using simple descriptive scale.

Ovariohysterectomy was performed in all the animals through right flank or midline approach as per standard surgical procedure with the above anaesthetic protocol.

Flank approach

The cat was placed in right lateral recumbency and its legs were extended caudally with ties. A 2.5 cm oblique incision was made on the right mid flank and the abdominal muscles were dissected along the direction of muscle fibers. The ovary and uterus were identified and exteriorized. The right ovarian pedicle was double ligated with 2-0 chromic catgut, severed using three clamp technique and released after inspection for hemorrhage. The procedure was repeated for left ovarian pedicle. The uterine body was exteriorized and an encircling ligature with 2-0 chromic catgut was placed cranial to cervix, the uterine body was severed by using three clamp technique and released after inspection for hemorrhage. The peritoneum, transverse and internal oblique muscles were closed in a continuous lock stitch suture pattern with 2-0 chromic catgut and external oblique muscle was closed in a horizontal suture pattern. Skin edges were opposed with simple interrupted suture using cotton thread.

Midline approach

The cat was placed in dorsal recumbency. A midline or slightly paramedian incision was made through the linea alba or rectus abdominis muscles and parietal peritoneum to enter the peritoneal cavity. The procedure was then identical to that described for the flank approach. The uterus was identified by repelling the intestine cranially and the bladder caudally and grasped with atraumatic forceps. The incision was extended if necessary. Then, abdominal incision was closed, the linea alba and subcutaneous tissues were closed with chromic

catgut using simple continuous suture pattern. Skin edges were opposed with simple interrupted suture using cotton thread.

Post-operative care

Antiseptic was applied at the incision site after suturing. Antibiotics were given to cats to avoid secondary infections. Anti-inflammatory and analgesics were given to reduce inflammation and pain. On 10th post-operative day sutures were removed.

Statistical analysis

Statistical analyses were performed using SPSS 20.0 version. The mean and standard errors were calculated and compared between both the groups. Two-way ANOVA evaluated pain scores within groups and student t-test compared pain scores between groups.

Results

No statistical difference was observed in surgical time between the MA group (mean \pm SD, 24.5 ± 4.5 min) and LA group (mean \pm SD, 28.0 ± 5.0 min). The results obtained through by assessing gross wound appearance and postoperative wound complications in both the groups were observed and scored and are presented in Table 1.

Table 1: Assessment of gross wound appearance and wound complications after 7 days post-surgery (LA: n=20; MA: n=20)

Gross wound appearance	None		Mild		Severe	
	LA	MA	LA	MA	LA	MA
Discharge	-	-	2	2	-	-
Excessive licking	-	-	-	-	-	-
Swelling	-	-	3	1	-	-
Dehiscence	-	-	-	-	-	-
Wound complications						
Evisceration	-	-	-	-	-	-
Hernia	-	-	-	-	-	-
Wound breakdown	-	-	-	-	-	-

Any postoperative complications were not encountered in all the groups. However, in LA group three cats had swelling and two cats had discharge from the suture site whereas, in MA group one cat had mild swelling and two cats had discharge from the site. Overall, wound appearance was also observed on 10 days after surgery and gross changes were analyzed.

The total pain score recorded at 1, 2, 5, 12 and 24 hours postoperatively in both the groups using simple descriptive scale are presented in Table 2.

Table 2: Total pain score recorded at different time interval postoperatively using Simple Descriptive Scale (SDS)

Parameter	Group	Total score at different time intervals				
		1	2	5	12	24
Postoperative pain score	LA	0	1	3	1	1
	MA	0	1	2	1	1

At one hour interval animal showed no signs of pain and scored 0 in both the groups. At two hours interval animal showed mild discomfort and flinches but not stroked when pressure applied around the surgical site and scored 1 and 1 in LA and MA groups, respectively. At five hours interval animal showed discomfort and flinches along with stroking when pressure applied around the surgical site and scored 3 and 2 in LA and MA groups, respectively. All the animals were administered with oral tramadol at the dose rate 2 mg

per kg body weight at 5th hour postoperatively. At twelve and twenty four hours interval animal showed signs of sleeping, mild discomfort but friendly when approached and given a score 1 in both the groups. Statistical comparison revealed no significant difference among groups.

Discussion

Ovariohysterectomy is the most common surgical procedure performed in cats, which prevented the risk of development of mammary tumour and pyometra. Although there is no standard surgical approach to the ovariohysterectomy of cats, some preferred midline over flank approach. However, Holly and Hardie (2004)^[3] suggested that lateral flank approach was found to be better for wound healing and also reduced potential risk of evisceration at the surgical site. The authors also stated that the surgical site could be observed from the distance for any complications. In contrast, Stone 2003^[10] suggested that the flank approach has several potential complications, including the possibility that the entire uterine body may be difficult to remove, a dropped ovarian pedicle may be difficult to recover, and that it may be difficult to expose the opposite ovary and uterine bifurcation.

In this study, a discharge from the wound was reported significantly more often in lateral flank than midline approach. A discharge from a surgical wound may be a result of seroma, bacterial infection or haemorrhage. The higher incidence of a discharge after a flank approach may have been due to the greater thickness of fat and muscle incised during this approach. Increase in the swelling after 24 hours of surgery might be due to suture material identified by immune system as foreign body and the inflammatory response described as foreign body reaction Kiani *et al.* 2006^[2]. In the present study, overall complication (evisceration, hernia and wound breakdown) were not encountered. However, postoperative discomfort and the appearance of the wound were not significantly different between the cats spayed by the two approaches.

In this present study, there was no difference in finding the uterus in either through flank or midline approaches. There was no significant difference between the total duration of the surgery required for the two approaches. However, there were significant differences between the times required for some stages of the procedures. The time taken from cutting the skin to entering the peritoneal cavity was longer for the flank approach, probably owing to the greater complexity of identifying the subcutaneous fat, and external and internal oblique muscles and peritoneum, compared with identifying the linea alba. The time taken from entering the peritoneum to finding the uterus was significantly longer with the midline approach. However, no significant difference was noticed in finding the uterus and completion of surgery in both the approaches. The results suggest that neither approach has any particular advantage over the other. However, Grint *et al.* (2006)^[4] compared flank approach with midline incision for ovariohysterectomy in cats of which wound tenderness was more in flank incision and that may be due to the muscle fibres being severed to gain access to the abdomen compared to midline incision. The authors also stated no significant differences in pain score between both the techniques.

However, there is no reason to reject either the midline or flank approach on the grounds of the duration of the surgery, or the incidence of postoperative complications. The authors consider that the midline approach is preferable, predominantly because the uterus sometimes cannot be identified from the flank approach, and it is difficult to be certain whether this is a technical problem or the cat has

already been neutered, without exploring from a midline approach. Certain rare congenital abnormalities, such as uterus unicornis, may also be difficult to identify and/or deal with from the flank approach. With the flank approach, if the ovarian or cervical pedicles are lost before they are ligated, they may be difficult to recover. One of the reasons for advocating the flank approach historically was the reduced risk of evisceration if dehiscence occurred (Krzaczynski 1974)^[9].

It is important to have thorough knowledge of the indications, advantages as well as disadvantages of either techniques, so that cases can be selected properly and potential complications can be avoided.

Acknowledgement: The authors are thankful to the Tamil Nadu Veterinary and Animal Sciences University for the support during the study.

Conflict of interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding The authors received a financial support from Tamil Nadu Veterinary and Animal Sciences University during the research.

References

1. Oliveria JP, R Mencalha, CADS Sousa, M Abidu-Figueiredo, SDF Jorge. Pain assessment in cats undergoing ovariohysterectomy by midline or lateral celiotomy through use of a previously validated multidimensional composite pain scale. *Acta. Cir. Bras.* 2014; 29:633-638.
2. Kiani FA, AB Kachiwal, MG Shah, ZA Nizamani, FM Khand, GM Lochi *et al.* Comparative study on midline and flank approaches for Ovariohysterectomy in cats. *J Agric. Food. Tech.* 2014; 4:21-31.
3. Holly MG, RJ Hardie. Lateral flank approach for ovariohysterectomy in small animals. *Vet. Med. Small Anim. Clin.* 2004; 70:569-573.
4. Grint NJ, PJ Murison, RJ Coe, AE Waterman Pearson. Assessment of the influence of surgical technique on postoperative pain and wound tenderness in cats following ovariohysterectomy. *J. Feline Med. Surg.* 2006; 8:15-21.
5. Coe RJ, NJ Grint, MS Tivers, AH Moore, PE Holt. Comparison of flank and midline approaches to the ovariohysterectomy of cats. *Vet. Rec.* 2006; 159:309-313.
6. Davidson EB, HD Moll, ME Payton. Comparison of laparoscopic ovariohysterectomy and ovariohysterectomy in dogs. *Vet. Surg.* 2004; 33:62-69.
7. Devitt CM, Cox RE, Hailey JJ. Duration, complications, stress, and pain of open ovariohysterectomy versus a simple method of laparoscopic assisted ovariohysterectomy in dogs. *J. Am. Vet. Med. Assoc.* 2005; 227:921-927.
8. Hedlund CS. Surgery of the reproductive and genital systems. In *Small Animal Surgery*. 2nd edn. Ed T. W. Fossum. St Louis, Mosby. 2002, 610-674.
9. Krzaczynski J. The flank approach to feline ovariohysterectomy (an alternate technique). *Veterinary Medicine – Small Animal Clinician.* 1974; 69:572-574.
10. Stone EA. Ovary and uterus. In *Textbook of Small Animal Surgery*. 3rd edn. Ed D. Slatter. Philadelphia, W. B. Saunders, 2003, 1487-1502.