

Original Research Article

<https://doi.org/10.20546/ijcmas.2019.805.038>

## Comparison of Two Different Laparotomy Techniques for Ovariohysterectomy and Post-Surgical Complications in Cats

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### ABSTRACT

#### Keywords

Midline, Flank, Ovariohysterectomy, Cat

#### Article Info

Accepted:  
04 April 2019  
Available Online:  
10 May 2019

Comparative study of two different laparotomy techniques and post surgical complications for ovariohysterectomy in cats were studied. The animals were randomly divided into two equal (n = 6) groups, A and B. In group A, ovariohysterectomy was performed by ventral midline approach, where as in group B, ovariohysterectomy was performed by flank approach. The duration of surgery, length of surgical incision, cost of surgery, complications peri and post-operatively were compared. In cats subjected to ovariohysterectomy through lateral flank approach had minimal hemorrhage at incisional site. Further, the length of surgical incision, time required for the complete surgical procedure, cost of the surgery and post operative healing complications were all significantly lower in animals subjected to ovariohysterectomy through a lateral left flank incision. It was concluded that the spaying through left lateral flank approach offers considerably more advantages than a ventral midline approach.

### Introduction

Despite the status of cats as human companions, a majority of cats in a developing country like India are stray and free roaming and constitutes a massive public health hazard. Additionally, numerous stray cats die from exposure, starvation or trauma every year. Surgical sterilization of female cats is the most opted technique by Veterinary Surgeons as animal birth control.

Ovariohysterectomy in cats, also known as spaying, is a surgical ablation of the ovaries

along with the uterus of a female cat, to make her disable to have any more conception. Traditionally, ovariohysterectomy is performed through a small ventral midline incision in cats (Coe *et al.*, 2006). However a ventral midline approach is difficult to carry out if surgery is performed shortly after delivery due to the engorgement of mammary glands and is also reportedly associated with some postoperative complications such as excessive hemorrhage from the skin and subcutaneous tissue, wound inflammation or infection and leakage from mammary tissue (McGrath *et al.*, 2004).

In view of these complications an alternate approach, a unique lateral left flank surgical approach has been suggested by Babu *et al.*, (2018). However there are very few studies which have made an attempt to compare the ease of the approach to the uterus and postoperative complications following ovariohysterectomy through a ventral midline and left lateral flank approach.

## **Materials and Methods**

Twelve healthy queen cats aged 1-3 years, weighing 2.5 – 4 kg presented to Department of Veterinary Gynaecology and Obstetrics, Veterinary College Hospital, Hebbal, Bangalore for ovariohysterectomy were randomly selected for this study. The queen cats selected were carefully examined to rule out pregnancy and any uterine disorders and for general health status and only queen cats found fit with normal body parameters were selected for surgery. The selected queen cats were randomly allotted in equal numbers in two groups. Group A consisted of six cats which were subjected for ovariohysterectomy by ventral mid line approach and Group B consisted of six cats which were subjected for ovariohysterectomy by flank approach.

The cats of both the groups were premedicated with Atropine sulphate (0.04 mg/kg body weight) subcutaneously. Anesthesia was induced by combination of Xylazine Hydrochloride (1 mg/kg body weight) and Ketamine Hydrochloride (25 mg/kg body weight) both drugs were loaded into the same syringe and had given intramuscularly to effect.

Group A cats were subjected for ovariohysterectomy by ventral mid line approach according to Fingland (1998) and Group B cats were subjected for ovariohysterectomy through a small incision left flank approach according to Babu *et al.*,

(2018). All animals were operated by a single surgeon with good expertise in both the surgical procedures. Length of surgical incision, ease of locating and exteriorization of uterus, ease of ligating ovaries, time required for the entire surgical procedure were objectively measured and any complications experienced during course of surgery were also duly recorded. Finally at the end of the surgery the cost of the surgery was calculated based on consumption of materials used for surgery such as syringes, drugs, suture materials, surgical gloves, dressing material and miscellaneous consumables. Following surgery, all the cats belonging to group A and B were admitted as inpatients and the incisional site was examined at 6, 12, 24, 72 hours and 7 days to evaluate the nature of wound healing and record any complications associated with wound healing.

## **Results and Discussion**

The mean time for completion of entire surgical procedure in Group A and Group B were  $12 \pm 0.41$  and  $6.7 \pm 0.48$  minutes respectively. Significantly higher mean time was recorded in Group A compared to Group B. The mean length of surgical incision for both Group A and Group B were recorded as  $1.5 \pm 0.13$  and  $0.77 \pm 0.06$  cm, respectively. The length of surgical incision was significantly longer in Group A compared to Group B. The ease of locating, exteriorization, ligation of ovaries was similar between the two groups. Neither anaesthetic nor the other surgical complications were recorded during the study period. The mean expenses incurred for surgery in Group A and Group B were recorded as  $160 \pm 0.67$  and  $142.3 \pm 0.89$  rupees, respectively. The mean surgical cost was significantly higher in Group A compared to Group B. Four out of six animals in group A exhibited varying degree of oedema around the surgical site

until 72 hours post surgery, while only one cat developed oedema at surgical site group B. Further, mild serosanguinous discharge observed at surgical site in two out of six animals in group A on 1<sup>st</sup> and 2<sup>nd</sup> day post surgery. On the other hand, none of the cats in group B showed any discharges. The time taken for complete healing of surgical site was much shorter with the left flank approach as compared to the ventral midline approach (7 days versus 11 days respectively).

The primary aim of the present study was to determine the surgical site which is most ideal for carrying out ovariohysterectomy in cats. Wilson and Balasubramanian, (1967) reported significant haemorrhage from the incisional site when ovariohysterectomy attempted through flank region. In the present study on the other hand, ovariohysterectomy was attempted through a stab puncture rather than an incision on abdominal muscle and such an approach was found to result in almost negligible haemorrhage at the surgical site. Ghanawanth and Mantri (1996) observed that exteriorizing opposite ovary and uterine horn was difficult from flank approach. In the present study, however, no difficulty was

encountered at the flank site in both exteriorizing and legating the ovarian peduncle and cervix.

Coe *et al.*, (2006) reported that there was no difference between the total duration of surgery required for the two approaches. In the present study, time required for the completion of ovariohysterectomy through the lateral flank approach was significantly shorter as the ovaries were approached through a stab incision through abdominal muscles and following spaying, the stab incision were left unsutured, thereby reducing the time required for the surgery.

Kiani *et al.*, (2014) reported time taken for lateral flank was significantly less compare to midline approach,  $24.50 \pm 1.48$  and  $28.33 \pm 0.92$  respectively. Coe *et al.*, (2006) observed that the duration of operation through flank was  $41 \pm 12$  min and it was  $43 \pm 11$  min for cats operated through midline approach. Though the above findings are in accordance with our study the total mean time taken for both the approaches are less in present study. This would be attributed to expertise of the surgeon in performing the surgery (Table 1).

**Table.1** Different parameter analysed to compare two ovariohysterectomy approaches

Parameters	Ventral Midline	Left flank
Time taken (min)	$12 \pm 0.41^a$	$6.7 \pm 0.48^b$
Length of surgical incision (cm)	$1.50 \pm 0.13^a$	$0.77 \pm 0.06^b$
Ease of locating and exteriorisation of uterus	$3.80 \pm 0.60$	$2.30 \pm 0.42$
Ease of legation of ovarian peduncle and cervix	$2.80 \pm 0.31$	$2.00 \pm 0.26$
Cost of surgery (Rs.)	$160.00 \pm 0.67$	$142.30 \pm 0.89$

It was also observed that spaying through a left flank incision resulted in fewer post operative complications such as wound oedema and abnormal discharges from the incisional site as compared to cats spayed through a ventral midline incision. The fewer complications observed in cats spayed through a stab incision a left flank approach is

probably due to minimal surgical exposure site, minimal trauma to the abdominal muscles, minimal handling of the tissues and the shorter time for completion of the surgical procedure. Another significant advantage of spaying a cat through a left flank stab incisional approach was the significantly lower expenses incurred towards the surgery

as compared to the ventral midline approach ( $142.3 \pm 0.89$  vs  $160 \pm 0.67$ ). Further cats subjected to spaying through a left flank stab incisional approach had a significantly a shorter interval from surgery to complete wound healing. Present study findings are in accordance with Kiani *et al.*, (2014), have reported  $14.50 \pm 0.89$  and  $10.67 \pm 1.15$  days for complete wound healing in ventral midline and lateral flank method respectively.

A significantly lower cost incurred for surgery, minimal post operative complications and faster wound healing in animals subjected to spaying through a left flank stab incisional approach are extremely advantageous when stray cats as most of such procedures in stray cats are carried out by non-governmental agencies which looking out at trying to reduce the cost of surgery and duration of post operative confinement of the animal.

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## How to cite this article:

Babu, M., A. Krishnaswamy, R. Nethra and Narasimhamurthy. 2019. Comparison of Two Different Laparotomy Techniques for Ovariohysterectomy and Post Surgical Complications in Cats. *Int.J.Curr.Microbiol.App.Sci.* 8(05): 331-334.  
doi: <https://doi.org/10.20546/ijemas.2019.805.038>