

Comparing wound complications associated with midline and flank approaches for spaying cats

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BOTTOM LINE

- There is no evidence that either a flank or midline approach for spaying cats is consistently associated with more wound complications, and, overall, complication rates appear to be low.

Clinical scenario

Miss Tabby brings you a colony of feral cats she has trapped in her garden to be neutered. The cats cannot be handled and will be monitored postoperatively by visual inspection from at least 10 feet away. She asks you if they can be spayed via a flank approach so that she will be able to see the incision site more easily.

However, as the cats can only be monitored from a distance, and re-trapping after surgery would be difficult, any postoperative complications would be very difficult to address and could potentially pose a serious welfare concern. You wonder if using a flank approach would lead to more postoperative wound complications than a midline approach.

The question

In [female cats that are being neutered] does a [midline surgical approach as compared with flank] [decrease wound complications following surgery]?

Search parameters

The search strategy can be viewed at <https://bestbetsforvets.org/bet/558>, and it is also available as a supplement to this article on *Vet Record's* website at <https://veterinaryrecord.bmj.com/content/186/6/188>

Search outcome

- One hundred and thirty-two papers were found in the Medline search.
- One hundred and twenty-nine were excluded because they did not answer the question.
- In total, three relevant papers were obtained.
- Two hundred and twenty-one papers were found in the CAB search.

- Two hundred and fifteen were excluded because they did not answer the question.
- Four papers were excluded because they were review articles, in vitro research or conference proceedings.
- In total, two relevant papers were obtained.
- Overall, a total of 3 relevant papers were identified.

Search last performed: 30 January 2020

Summary of evidence

Paper 1: Prospective comparison of perioperative wound and pain score parameters in cats undergoing flank vs midline ovariectomy¹

Patient group: A total of 75 client-owned animals presented to a veterinary clinic for elective ovariectomy.

Study type: Randomised controlled trial.

Outcomes: The cats' resting heart rate, respiratory rate and resting pain score (measured using the feline acute pain scale [FAPS]) were monitored both before surgery and intraoperatively. The duration of surgery and any intraoperative complications occurring (including hypotension, haemorrhage, slipping of ligatures or break in aseptic technique) were also recorded.

Resting pain, wound tenderness, surgical site swelling, discharge from the wound and periwound erythema were assessed one hour after surgery, at time of discharge and three and 10 days after surgery.

Key results: The duration of surgery and the number of intraoperative complications occurring did not vary significantly between the two surgical approaches. Cats in both groups had significantly higher FAPS scores after surgery, with cats in the flank group having significantly higher scores than those in the midline group at one hour after surgery and at discharge. However, cats in the midline group had significantly higher scores than those in the flank group at the three day and 10 day postoperative re-examinations.

Swelling of the surgical wound was significantly higher in cats in the midline group at the time of discharge, as well as at the three day and 10 day re-examinations.

No cats in either group were reported to have a wound breakdown or infection. Study weaknesses: No details about the block randomisation were given, and many of the scales used to measure wound complications were not validated. In addition, another study's sample size calculation was used to justify the number of animals recruited to the study. This issue is compounded by the number of animals dropping out of the follow-up assessments, with 32 per cent missing from the three day postoperative examination and 53.3 per cent missing from the 10 day examination.

As the surgeries were carried out by veterinary students, they took considerably longer than would normally be expected. Non-steroidal anti-inflammatory medication was also only administered postoperatively, which is likely to have reduced its effectiveness.

This study concerned only ovariectomy and not ovariohysterectomy. It was included in this analysis because they are considered similar procedures – especially in the flank approach, where most attempted ovariohysterectomies become ovariectomies with partial hysterectomy due to limited exteriorisation. However, this factor should be taken into consideration when compared this study with others describing ovariohysterectomy.

Paper 2: Effect of age and surgical approach on perioperative wound complication following ovariohysterectomy in shelter-housed cats in Australia²

Patient group: A total of 312 shelter cats identified retrospectively from the database of the Cat Protection Society of New South Wales' desexing programme. These cats underwent surgery at four different clinics, with one clinic using a flank approach and the other three using a midline approach.

Study type: Retrospective.

Outcomes: The age of the cats at the time of spaying and any postoperative wound complications reported were recorded.

Key results: Wound complications were identified in 19 of the 312 cats, and these were related either to inflammation at the

surgical site (n=18) or wound dehiscence (n=1). Compared with a flank approach, cats had a 2.95-fold increased risk of wound complications when a midline approach was used. When stratified for age, cats up to 12 weeks old had a 4.59-fold increased risk of wound complications when a midline approach was used than when a flank approach was used. No difference was seen between the two approaches in cats over 12 weeks old.

Study weaknesses: Not enough detail is given in terms of the description of the wound complications, there was no justification of the sample size obtained and it was not stated whether ethical approval had been sought for the study.

Non-significant findings were not discussed, but the level at which statistical significance was set was not stated. In addition, the fact that the surgeries were carried out at four different clinics is likely to have introduced bias to the results.

Paper 3: Comparison of flank and midline approaches to the ovariohysterectomy of cats³

Patient group: A total of 66 cats from animal welfare organisations undergoing ovariohysterectomy at a veterinary teaching hospital before being rehomed.

Study type: Randomised controlled trial.

Outcomes: Seven days after surgery, owners completed a questionnaire to record wound complications (discharge, excessive licking, swelling or breakdown) and grade them as mild or severe.

Key results: A total of 41 questionnaires were returned – 17 for cats that were spayed using a flank approach and 24 for cats that were spayed using a midline approach. Five cats in the flank group had mild wound discharge, compared with one in the midline group. Three cats in the midline group developed severe swelling, but none in the flank group did. No wound breakdowns were reported for either approach.

Study weaknesses: The surgeries were performed by many different students, and this may have resulted in more



Cat recovering from spay surgery performed using a midline approach

complications and pain than if a single, more experienced surgeon had performed them. Additionally, outcomes were assessed solely by the owners and, thus, were highly subjective.

Comments

There are a number of constraints to be considered when comparing these three papers. First, one paper described ovariectomy,¹ while the other two^{2,3} described ovariohysterectomy. Second, two studies used shelter animals,^{2,3} while one used client-owned animals.¹

Third, surgery was performed by veterinary students in two studies,^{1,3} while qualified veterinary surgeons performed the procedures in the third.² Finally, postoperative assessment was carried out by veterinary surgeons in two of the studies,^{1,2} while owner-reported outcomes were recorded in the third.³

As these studies showed differences

regarding which approach led to more complications across different time points, this suggests that other factors, such as surgeon experience, sterility and analgesia, may be more important than surgical approach in determining postoperative outcomes.

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References

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- 2 Roberts ML, Beatty JA, Dhand NK, *et al.* Effect of age and surgical approach on perioperative wound complication following ovariohysterectomy in shelter-housed cats in Australia. *JFMS Open Rep* 2015; doi: 10.1177/2055116915613358
- 3 Coe RJ, Grint NJ, Tivers MS, *et al.* Comparison of flank and midline approaches to the ovariohysterectomy of cats. *Vet Rec* 2006;159:309–13

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