

Critical appraisal – Randomised controlled trial questions

Gauthier, O., Holopherne-Doran, D. Gendarme, T., Chebroux, A, Thorin, C., Tainturier, D, Bencharif D. (2015) Assessment of Postoperative Pain in Cats After Ovariectomy by Laparoscopy, Median Celiotomy, or Flank Laparotomy, Veterinary Surgery 44 (2015) O23-O30

Introduction	
Are the aims clearly stated?	Yes, “to compare postoperative pain, duration of surgery, and duration of anaesthesia for 3 methods of ovariectomy in cats: (1) conventional ventral median open approach (Midline), (2) right flank approach (Flank), and (3) median 2-portal laparoscopic procedure (Lap).”
Methods	
Is the study design suitable for the aims?	Yes, the population was assigned to one of three groups, where the only difference was the type of ovariectomy procedure.
Which population was studied?	68 ASA 1, DSH female cats scheduled for routine ovariectomy. They had received no analgesia in the previous 48 hours. Aggressive cats were excluded.
Were the treatments randomly allocated? If yes, how was the randomisation done?	Yes Computer generated random number list
Were the groups comparable prior to intervention?	No significant differences in terms of age, preoperative body temperature, HR, RR, or temperament. All had initial pain score of 0 The mean weight of the flank group was significantly higher.
Was the person who administered the interventions blinded?	No, not possible with surgery.
Is it clear what measurements were carried out in the study?	Yes, Cats were evaluated for HR, RR, temperature, and pain score at 1,2, 4, 6, and 12 hours after extubation.

Were the correct measurements chosen?	Yes
Do they reflect (or are they strongly related to) the outcome of interest?	Yes
Were previously established validated methods used to make the measurements? (e.g. Glasgow pain score, International Units etc)	Used a previously created pain scale 4A-Vet, which has been validated in dogs for postoperative pain.
What outcomes were measured?	Postoperative complications, duration of surgery, duration of anaesthesia, duration of recovery, quality of recovery, level of postoperative consciousness, HR, RR, BT, pain score, appetite, doses of propofol for induction, number of perioperative morphine boluses
Are the outcomes clinically relevant?	Yes, a clinician will want to know if their surgical approach is related to these outcomes.
Were the outcomes assessed blind?	No.
Are the statistical methods described?	Yes, variables were compared between groups using 1-way ANOVA followed by a post hoc Tukey test. Repeated measurements used a linear mixed effects model.
Was the statistical significance level stated?	Yes, $p = 0.05$
Was the sample size justified?	No
Was ethical approval obtained?	Yes
Are the methods described in enough detail that	Yes.

you could repeat them?	
Results	
Were the basic data adequately described?	Would be good to see more data, mostly aggregated results
Do the numbers add up? Are all subjects accounted for?	As much as we can tell As much as we can tell
Was the statistical significance (p value) stated in the results? Is this consistent with the methods? (It should be stated in the sample size or power calculation)	Yes, for significant main findings, below. Not given where significance was not found. For the analysis of the pre-intervention data to compare the groups, it was only noted whether any differences had $P < 0.05$ or not. Consistent with methods.
Were any side effects of the intervention reported if applicable?	No surgical complications were recorded One cat was excluded because it was treated for hypotension. Two cats (one from flank group and one from midline) became too aggressive to handle after the procedure and were excluded from the study.
What were the main findings/key results?	Pain score was significantly lower in the Lap group when compared to either the Flank ($p = 0.016$) or the Midline ($p < 0.001$). Pain scores did not differ significantly between Flank and midline groups (no p value). The lap procedure was significantly longer ($P < 0.05$).
Discussion and conclusion	
What do the main findings/key results mean?	No difference between midline and flank for pain scores, and lap spay had significantly lower pain scores than either.

Are the negative findings discussed?	Discussed some of the limitations of the study.
How are the negative findings interpreted?	Little discussion of why no difference was found between flank and midline.
Does the discussion reflect the results?	Yes, discussed pros and cons of different approaches and shortcomings of the study.
Interpretation	
What are the clinical implications of this study?	No significant difference between flank and midline incision, but power calculation to detect a difference was not done.
Are the subjects in the study similar to those in the BET/your own?	A lap spay was significantly less painful. Study subjects older than BET subject (midline average 8m, flank 10 months and lap 11 m) so all post-pubertal.
General	
Who funded this study?	Not stated