



Efecto del tratamiento de pinza bipolar en OVE en *felis catus*

Effect of bipolar clamp treatment on OVE in felis catus

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Palabras claves:

Pinza Bipolar
OVE
Electrocauterio

Resumen

Introducción: en el ámbito de la clínica veterinaria, la esterilización se muestra como la cirugía de mayor frecuencia en gatas, no solo por su papel en la prevención de patologías del aparato reproductor, sino también por su contribución a la reducción del riesgo de contagio de enfermedades de transmisión sexual. En este contexto, el presente estudio se enmarca en el dinámico panorama de la medicina veterinaria, caracterizado por una revolución impulsada por avances tecnológicos. La investigación propuso la implementación de la pinza bipolar estilo bayoneta del Electrocauterio LED SPA SURTRON 160, Código 10100.30, de origen italiano. El objetivo central consistió en evaluar el impacto del tratamiento con dicha pinza bipolar en la Ovariectomía (OVE) en gatos domésticos (*Felis catus*). **La metodología** empleada abordó la comparación de dos técnicas quirúrgicas en un grupo de 30 pacientes felinos, divididos de manera homogénea. El grupo A, sometido a OVE, fue tratado mediante sutura absorbible de ácido poliglicólico, mientras que el grupo B fue sometido al mismo procedimiento, pero utilizando la pinza bipolar. Este enfoque metodológico riguroso buscó proporcionar una evaluación comprehensiva del efecto del tratamiento con la pinza bipolar en comparación con la técnica convencional de sutura absorbible. **Resultados.** Al trabajar con una muestra homogénea de pacientes felinos, se logró obtener un conjunto uniforme de datos. Los resultados indican que la cirugía de Ovariectomía (OVE) realizada con la pinza bipolar requiere significativamente menos tiempo en comparación con la técnica convencional de OVE, según el análisis de la prueba T de Student. En cuanto al dolor, no se observaron diferencias estadísticamente significativas entre ambas técnicas; sin embargo, se registró una menor intensidad del dolor en el grupo tratado con la pinza, según los resultados del análisis de Kruskal-Wallis. **En conclusión,** se infiere que la aplicación de la pinza en la OVE en gatas es recomendable, ya que no solo se traduce en una reducción significativa del tiempo quirúrgico, sino que también se muestra como una técnica confiable. Estos hallazgos respaldan la viabilidad y eficacia del uso de la pinza bipolar en este procedimiento específico, sugiriendo su consideración como una opción preferente en la práctica clínica veterinaria.

Keywords:

Bipolar forceps,
OVE,
electrocautery

Abstract

In the veterinary clinic, sterilization is the most frequently performed surgery in female cats, not only because of its role in the prevention of reproductive pathologies, but also because of its contribution to the reduction of the risk of sexually transmitted diseases. In this context, the present study is framed in the dynamic landscape of veterinary medicine, characterized by a revolution driven by technological advances. The research proposed the implementation of the bayonet style bipolar clamp of the Italian origin LED Electrocautery SPA SURTRON 160, Code 10100.30. The main objective was to evaluate the impact of the treatment with these bipolar forceps in Ovariectomy (OVE) in domestic cats (*Felis catus*). The methodology employed involved the comparison of two surgical techniques in a group of 30 feline patients, homogeneously divided. Group A, who underwent OVE, was treated using polyglycolic acid absorbable suture, while group B underwent the same procedure, but using bipolar forceps. This methodologically rigorous approach sought to provide a comprehensive evaluation of the effect of treatment with the bipolar clamp compared to the conventional absorbable suture technique. Results. By working with a homogeneous sample of feline patients, a uniform data set was obtained. The results indicate that the Ovariectomy Surgery (OVE) performed.

Introduction

Currently, contraceptive techniques are available for companion animals that play a crucial role in preventing unwanted pregnancies, as well as in protecting against diseases of the mammary gland and reproductive tract.

Elective sterilization is the most indicated as a prophylactic and if it is performed before the first heat, it reduces the probability of presenting breast tumors to 0.5%; its execution at early ages is of great importance because it prevents several diseases such as pyometra, pseudopregnancies, metritis, uterine and vaginal prolapses (Salas et al., 2016), in the same way sexual activity is eliminated, thus reducing the risk of sexually transmitted diseases such as the feline leukemia virus, among others (Krecic et al., 2018).

Over the years, contraceptive surgery techniques have been described, with the idea of reducing time, pain and cost. There are two approaches to perform the procedure: the midline approach (celiotomy) and the lateral approach. (White, 2020) However, at present, a technique for female cats that is the most appropriate has not been determined (Toledo-Valdez et al., 2021).

It should be noted that a technique that is not performed correctly can cause complications because the ovarian cortex is not completely removed and therefore remains active despite elective surgery. This incomplete removal can be unilateral or bilateral, this can be caused by several factors such as a very short incision in the abdominal wall since it prevents correct visualization or incorrect ligation of the tissues (Sontas et al., 2007). Leaving ovarian remnants results in clinical signs such as bleeding from the vulva, swelling of the vulva, changes in behavior and its detection would require complementary tests and even exploratory surgery.

Visibility of the surgical field becomes difficult when there is some type of hemorrhage, it reduces the ease and even the cleanliness of surgical techniques and produces an optimal environment for complications such as infections, seromas and hematomas that delay healing time. (Boxes, 2018).

Veterinary medicine has been taking a turn towards new technology. For example, electrocoagulation is an advance that benefits the development of new instruments that are more practical and take less time. (Granados, 2017) In recent years, priority has been given to keeping the patient comfortable within the surgical field, to have a non-traumatic recovery and to return to their daily activities as soon as possible. Veterinarians are in continuous training and updating of knowledge since in the current time technology advances and so do the techniques (Altamira et al., 2020).

The objective of this study was to evaluate OVE with bipolar forceps as the optimal method for sterilization in female felines, by comparing the total time spent, degree of postoperative pain, and presence of hemorrhage.

Importance of sterilization

The first sterilization was carried out in 1985 by Wildt and Lawler, over time surgical procedures have been modified and made more technical, since the 90s there has been interest in avoiding overpopulation, in the year 2000 to 2016 in Mexico between 4.8 million dogs and cats were sterilized free of charge (López-Iglesias et al., 2022), the population of abandoned animals is directly related to economic problems and lack of responsible ownership by the owners, in this way the number of animals that are wandering the streets and uncontrolled reproduction increases, being a problem for human health since they can transmit zoonotic diseases or cause bites between animals

(Rojas et al., 2019). There are several forms of population control, however, the safest are surgical, this method helps to control overpopulation and by performing a correct technique would not cause complications.

Methodology

Animals

Thirty mixed breed cats were examined, which were clinically in optimal health. For the purpose of the study, they were classified into two groups according to the technique used.

Table 1

Research variables

Variables
Independent:
- Process time from induction
- Time since surgery begins
- Time since cutting the ovarian vein and artery
- Total surgery time
- Time in which you have ocular reflex after surgery
- Each Glasgow Pain Scale score at the end
Dependent:
- Postoperative complication rate
- Recovery time (significant pain)
- Weight
- Age
- Conventional surgery type VS bipolar forceps

Type of research: Quantitative approach

Research methods, techniques and instruments

- Area of study

Urban area of Cuenca, province of Azuay

- Universe of study

Felis catus located southwest of the city of Cuenca, in 2023.

Phase 1:

Patients

A sample of 30 mixed-breed female felines was taken, which were subdivided into two groups of 15 females respectively, group A and group B.

Premeditation

As a prophylactic antibiotic measure, ceftriaxone was administered at a dose of 25 mg/kg intravenously, 30 minutes before the procedure. In addition, a combination of omeprazole at a dose of 40 mg per kg intravenously, maropitant citrate at a dose of 10 mg per kg intravenously, and meloxicam at a dose of 0.2 mg/kg intravenously was administered.

Anesthetic Protocol

Xylazine (hydrochloride) 20 mg was used as a co-inducer at a dose of 0.3 mg/kg by intravenous administration. Subsequently, ketamine (hydrochloride) 100 mg was administered at a dose of 5 mg/kg, followed by 2% propofol at a dose of 4 mg/kg.

The surgical technique used consisted of a medial ovariectomy (OVE). It began with a subumbilical celiotomy, using a dissecting forceps to apply traction and making a small incision with a scalpel. Subsequently, a channeled tube was introduced as a precaution to avoid damage to the organs. Then, an incision was made along the linea alba over the channeled tube, crossing the peritoneum to allow the surgeon to view the viscera.

Once the ovary was located, it was externalized and isolated for ligation. In the T1 group (control), absorbable polyglycolic acid suture was used with a modified Miller suture pattern. In the T2 group (forceps), a sweep was performed with a straight mosquito forceps and ligated with the SPA SURTRON 160 LED Electrocautery bipolar bayonet forceps, Code 10100.30, from Italy. In this way, the left and right ovarian pedicles were ligated, ensuring that there was no bleeding.

The abdominal incision was closed layer by layer, starting with the muscle fascia with a continuous anchored suture pattern, using a 2-0 gauge, 1/2 circle 25 mm round tip absorbable multifilament biomaterial suture. To close the skin, a subdermal suture with polyglycolic acid and a 30 mm 3/8 circle needle with a cutting tip was applied.

In each patient in both groups, the following procedure times were recorded:

- Process time from induction
- Time since surgery begins
- Time since cutting the ovarian vein and artery
- Total surgery time
- Time in which you have ocular reflex after surgery

Phase 2:

Postoperative pain was subsequently assessed using the Glasgow scale, and it was verified whether pain was present. (Brondani, et al., 2014).

24 hours later, a new evaluation was performed to determine the presence of pain, whether it interfered with her comfort zone and her behavior.

Postoperative

- Glasgow scale
- Control ultrasound to rule out hemorrhage

Phase 3:

To analyze the data, the Student T test and Kruskal Wallis test were used to compare the 2 treatments for independent variables.

Results

Within the framework of the results of the present investigation, a total of 30 mixed-breed cats were included, which were classified into two treatment groups: T. Control and T. Pinza. All (100%) of the cats presented an optimal health status during the review. Regarding age, the control treatment group had a mean age of 20.27 months with a standard deviation of ± 11.67 , while the pinza treatment group had a mean age of 21.33 months with a standard deviation of ± 13.32 .

In relation to weight, it was observed that the control treatment group had an average weight of 2.69 ± 0.52 standard deviation, while the clamp treatment group showed a weight of 3.08 ± 0.74 standard deviation ($P > 0.005$).

Regarding behaviour, in the control treatment group, 5 restless and 10 calm cats were identified. On the other hand, in the clamp treatment group, 6 restless and 9 calm cats were recorded. All comparisons yielded a p value > 0.5 , indicating that there are no significant statistical differences between the groups and that, therefore, it can be stated that both groups were homogeneous in terms of behaviour.

Table 2

Time of treatments

Variable	Control (n=15)	Clamp (n=15)	p-value
Ketamine(s)	66.73 (6.56)	67.53 (4.55)	0.700
Propofol(s)	96.00 (6.19)	96.67 (5.50)	0.757
Total, Anesthesia(s)	162.73 (10.93)	164.20 (6.13)	0.654
Surgery time (min)	42.27 (2.91)	35.93 (1.53)	< 0.000

Cut(s)	0	4.33 (0.82)	Sd
Palpebral reflex(s)	275.87 (83.26)	289.60 (72.72)	0.634

In the table we can observe how the variables of ketamine, propofol, total anesthesia time, cut and palpebral reflex are equal, while the total surgery time is shorter as indicated in the T student table.

Table 3

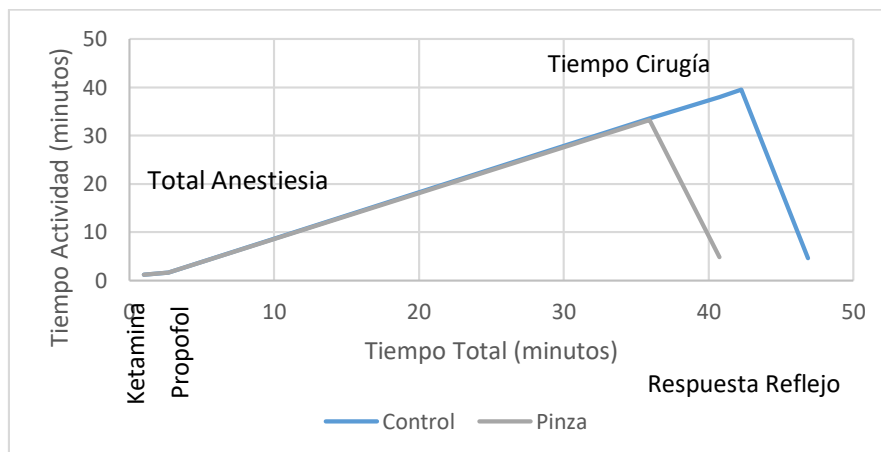
Pain from treatments

	Control	Clamp	H value	p-value
Scale 1	1	1	0.10	0.695
Scale 2	1	1	0.10	0.709

There is no significant difference in pain, even though it may have appeared in the Kruskal and Wallis tests. The pain is statistically the same, but with the clamp it is shorter in relation to time, so the technique is favorable since no animal suffered.

Figure 1

Time difference between T1 (control) and T2 (clamp)



In the graph we observe how the time of clamp surgery compared to control is shorter.

Discussion

Today, the advancement of technology in veterinary medicine represents a new horizon that promises significant benefits. Previous studies have concluded that modern technology-supported techniques not only improve the well-being of patients, but are also less invasive, cause less pain, and allow for a faster recovery. This approach contributes to reducing stress in animals, as they can return to their daily activities more efficiently (Alonso, 2018).

The use of animals in surgery has experienced a remarkable development in the last decade worldwide, with a significant increase in the variety of techniques used (Nelson & Guillermo, 2020). In the present study, the application of the bipolar clamp has been shown to have a positive impact on Ovariectomy (OVE) in cats, keeping patients without evidence of pain according to the Gasglow scale. This result supports the reliability of the bipolar clamp as an effective method, whose purpose is to minimize pain, accelerate recovery and reduce associated trauma.

Pain assessment using the Gasglow scale allowed us to analyse pain levels in patients in groups T1 and T2 immediately after surgery, as well as 24 hours later. The results favoured the use of bipolar forceps, highlighting the efficacy of this test as an easy and effective tool.

Given the paucity of information on spaying in pet cats, this study seeks to contribute to the establishment of the proper and beneficial use of the bayonet-style bipolar clamp. It is hoped that the results obtained will encourage future research, thus consolidating the continued usefulness of this technique in the veterinary field.

Conclusions

In the framework of the present investigation, the results obtained provide conclusive evidence of the marked efficacy of the treatment with the bayonet-style bipolar clamp compared to the control treatment, especially with regard to the time factor. An absence of significant variation is observed between the T1 and T2 treatments, thus validating the use of the bipolar clamp in Ovariectomy (OVE) in cats.

- The bipolar forceps in OVE not only stand out for their effectiveness, but also for being a tool of remarkable safety, efficiency and speed. These findings suggest that it could be considered as a priority option for carrying out sterilization in female cats.
- Furthermore, it is evident that the application of bipolar forceps contributes significantly to the reduction of postoperative pain, promoting a faster recovery and minimizing the associated trauma. Compared to conventional surgery, a significant decrease in the time required for the procedure is observed, thus consolidating bipolar forceps as an alternative that not only optimizes the effectiveness of the treatment, but also improves the overall experience of the feline patient during the sterilization process.

Conflict of interest

The authors declare that there is no potential conflict of interest.

Bibliographic References

- Alonso, G. (2018). Minimally invasive surgery in veterinary medicine: evolution, impact and future prospects. Review. Journal of the Faculty of Veterinary Medicine and Animal Husbandry, 65(1).
<https://doi.org/10.15446/rfmvz.v65n1.72035>
- Altamira, J., León, R., & Castañeda, H. (2020). Dexmedetomidine in the transverse plane block of the abdomen. Ciencia Huasteca Scientific Bulletin of the Higher School of Huejutla, 8(16), 34-39. <https://doi.org/10.29057/esh.v8i16.5711>
- Brondani, J., Luna, S., Crosignani, N., Redondo, J., Granados, M., Bustamante, H., . . . Otero, P. (2014). Validity and reliability of the Spanish version of the UNESP-Botucatu multidimensional scale for assessing postoperative pain in cats. Archives of Veterinary Medicine, 46(3). <http://dx.doi.org/10.4067/S0301-732X2014000300020>
- Cajas, C. (2018). Factors associated with post-surgical wound complications. General Surgery, IESS General Hospital, Milagro. Scientific Journal of Research Update of the World of Sciences, 3(1). doi:10.26820/reciamuc/3. (1). January.2019.464-482
- Granados, J. (2017). Clinical study of laparoscopic ovariectomy using instruments of 3 and 5 mm diameter in the canine species. (Doctoral Thesis. University of Extremadura, Spain).
https://dehesa.unex.es/bitstream/10662/6298/1/TDUEx_2017_Granados_Ortega.pdf
- Krecic, M., Velineni, S., Meeus, P., Fan, H., & Loenser, M. (2018). Diagnostic performances of two rapid tests for detection of feline leukemia virus antigen in sera of experimentally feline leukemia virus-infected cats. Journal of Feline Medicine and Surgery Open Reports, 4(1). doi:10.1177/2055116917748117
- López-Iglesias, B., Frías-Argüello, V., García-Rodríguez, J., & Ángel-Hernández, A. (2022). Minimum invasive ovariectomy technique in canines in Mexico. Young people in science - Journal of science dissemination, 14.
<https://doi.org/10.15174/jc.2022.3472>
- Nelson, R., & Guillermo, C. (2020). Small Animal Internal Medicine (6th ed.). (G. Asis, Ed.) Servet Diseño y Comunicación SL <https://www.casadellibro.com/libro-medicina-interna-de-pequenos-animales-6-ed/9788418339240/11717095>

- Rojas, P., León, D., & Falcón, N. (2019). Characteristics of dogs and cats under surgical reproductive control registered in the Municipality of Los Olivos, Lima, Peru. Period 2015-2016. *Journal of Veterinary Research of Peru*, 30(2).
<http://dx.doi.org/10.15381/rivep.v30i2.16093>
- Salas, Y., Aburto, E., Alonso, R., Márquez, A., Corona, H., & Romero, L. (2016). Association of histological features with potential risk factors and survival in canine mammary tumors. *Veterinaria Mexico OA*, 3(1).
[doi:10.21753/vmoa.3.1.359](https://doi.org/10.21753/vmoa.3.1.359)
- Serra, S., Palomares, P., Pinto, M., & Almeida, E. (2015). Cannabinoids: current utility in clinical practice. *Grupo Ángeles*, 13(4), 240-255.
<https://www.medigraphic.com/pdfs/actmed/am-2015/am154f.pdf>
- Sontas, B., Gürbulak, K., & Ekici, H. (2007). Ovary remnant syndrome in the bitch. *Archives of Veterinary Medicine*, 39(2). <http://dx.doi.org/10.4067/S0301-732X2007000200002>
- Toledo-Valdez, C., Rivera-Barreno, R., Talamantes-Lima, I., Bustos-Varela, J., García-Herrera, R., & Rodríguez-Alarcón, C. (2021). Systematic review of the different surgical techniques for contraception in cats. *Veterinary Fan*, 11.
https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2448-61322021000100203#B6
- White, S. (2020). High-Quality, High-Volume Spay and Neuter and Other Shelter Surgeries. [doi:10.1002/9781119646006](https://doi.org/10.1002/9781119646006)

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