




## SURGICAL TECHNIQUES AND POSTOPERATIVE CARE OF ORCHIECTOMY IN DOGS

### TÉCNICAS CIRÚRGICAS E CUIDADOS PÓS-OPERATÓRIOS DA ORQUIECTOMIA EM CÃES

### TÉCNICAS QUIRÚRGICAS Y CUIDADOS POSOPERATORIOS DE LA ORQUIECTOMÍA EN PERROS

 <https://doi.org/10.56238/isevmjv5n3-004>

Receipt of originals: 04/22/2026

Acceptance for publication: 05/22/2026

**Gabriela da Silva Vianna<sup>1</sup>, Caroline Gracielle Torres Ferreira<sup>2</sup>, Maria Eduarda Terra<sup>3</sup>, Pablo Ioran Rodrigues Sales<sup>4</sup>, Carlos Roberto Cruz Ubirajara Filho<sup>5</sup>**

#### ABSTRACT

This article reviews the main surgical techniques and clinical care guidelines necessary for the successful performance of orchietomy in dogs. Elective orchietomy is a common procedure, essential for population control, mitigation of undesirable behaviors, and prevention of andrological diseases such as benign prostatic hyperplasia (BPH). However, the timing of neutering requires individualized evaluation, since early castration may be associated with an increased risk of orthopedic disorders and neoplastic conditions in predisposed breeds. In the surgical context, the conventional technique coexists with laparoscopic castration, which stands out as a minimally invasive method resulting in less tissue trauma and reduced postoperative pain and stress. For procedural success, adequate analgesic management (with NSAIDs and opioids) and maintenance of thermoregulation during the perioperative period are essential to mitigate complications and ensure the patient's welfare and rapid recovery.

**Keywords:** Orchietomy. Laparoscopic Castration. Analgesia. Thermoregulation. Dogs.

#### RESUMO

Este artigo revisa as principais técnicas cirúrgicas e as diretrizes de cuidados clínicos necessárias para o sucesso da orquiectomia em cães. A orquiectomia eletiva é um procedimento comum, essencial para o controle populacional, mitigação de comportamentos indesejados e prevenção de patologias andrológicas, como a hiperplasia prostática benigna (HPB). Contudo, o momento da castração requer avaliação individualizada, visto que a castração precoce pode estar associada a um risco elevado de distúrbios ortopédicos e condições neoplásicas em raças predispostas. No âmbito cirúrgico, a técnica convencional coexiste com a castração laparoscópica, a qual se destaca por ser um método minimamente invasivo que resulta em menor trauma tecidual e redução da dor e estresse pós-operatório. Para o sucesso do procedimento, é fundamental o manejo analgésico adequado (com AINEs e opioides) e a manutenção da

<sup>1</sup> Undergraduate Student. Pontifícia Universidade Católica de Goiás (PUC).

<sup>2</sup> Dr. in Veterinary Medicine. Universidade Federal de Viçosa (UFV).

<sup>3</sup> Graduated in Veterinary Medicine. Universidade de Caxias do Sul (UCS).

<sup>4</sup> Graduated. Centro Universitário Doutor Leão Sampaio (UNILEÃO).

<sup>5</sup> Professor of Veterinary Medicine. Universidade Federal do Agreste de Pernambuco (UFAPE).



termorregulação durante o período perioperatório, a fim de mitigar complicações e garantir o bem-estar e a recuperação rápida do paciente.

**Palavras-chave:** Orquiectomia. Castração Laparoscópica. Analgesia. Termorregulação. Cães.

## RESUMEN

Este artículo revisa las principales técnicas quirúrgicas y las directrices de cuidados clínicos necesarias para el éxito de la orquiectomía en perros. La orquiectomía electiva es un procedimiento común, esencial para el control poblacional, la mitigación de comportamientos indeseables y la prevención de patologías andrológicas, como la hiperplasia prostática benigna (HPB). Sin embargo, el momento de la castración requiere una evaluación individualizada, ya que la castración temprana puede estar asociada con un mayor riesgo de trastornos ortopédicos y afecciones neoplásicas en razas predispuestas. En el ámbito quirúrgico, la técnica convencional coexiste con la castración laparoscópica, que se destaca por ser un método mínimamente invasivo que produce menor trauma tisular y reducción del dolor y del estrés posoperatorio. Para el éxito del procedimiento, es fundamental un manejo analgésico adecuado (con AINEs y opioides) y el mantenimiento de la termorregulación durante el período perioperatorio, con el fin de mitigar complicaciones y garantizar el bienestar y la rápida recuperación del paciente.

**Palabras clave:** Orquiectomía. Castración Laparoscópica. Analgesia. Termorregulación. Perros.



## 1 INTRODUCTION

Elective orchiectomy is one of the most commonly performed surgical procedures in the veterinary clinical routine, being essential for population control, the mitigation of unwanted behaviors (such as urinary marking and aggressiveness), and the prevention of various andrological pathologies (Tavares et al., 2021). Historically, removal of the testicles has been recommended as a preventive measure against benign prostatic hyperplasia (BPH) and testicular tumors. However, recent evidence has caused a paradigm shift, indicating that early castration may be associated with an increased risk of neoplastic conditions (such as osteosarcoma and lymphoma), orthopedic disorders, and obesity, depending on the breed and size of the animal (Wenham and Santos, 2024; Quarterone et al., 2017).

In the surgical field, the conventional technique has evolved from the open prescrotal approach to the development of minimally invasive methods. The transition to laparoscopy aims to reduce postoperative pain, length of hospital stay, and the risk of infections, meeting a growing demand from owners for less traumatic procedures (Romagnoli, 2025). In addition to the operative technique itself, the maintenance of homeostasis during the perioperative period, especially with regard to thermoregulation under general anesthesia, is a critical challenge, since hypothermia can delay recovery and compromise healing. Likewise, adequate analgesic management, using non-steroidal anti-inflammatory drugs (NSAIDs) and opioids, is essential to ensure the patient's well-being in the postoperative period. This article reviews the key surgical techniques and clinical care guidelines required for successful orchiectomy in dogs (Angrimani et al., 2020; Romagnoli, 2025).

## 2 METHODOLOGY

The present study is a narrative literature review, structured with the aim of compiling and examining contemporary scientific evidence about Surgical Techniques and Postoperative Care of Orchiectomy in Dogs. The investigation was carried out by consulting the PubMed database, using the descriptors Orchiectomy and Dogs, articulated via logical operators AND and OR, in accordance with the terminology of Medical Subject Headings (MeSH). The selection included works published in the last ten years, with access to the full text and written in Portuguese or English, which had direct adherence to the theme. Studies with no pertinent relationship to the central focus,



duplicate publications, narrative reviews with marked methodological limitations, and documents not indexed on the aforementioned platform were disregarded. The selection process was carried out in two stages: preliminary screening of titles and abstracts, followed by full analytical reading to ratify relevance. The information collected was systematized under a descriptive approach.

### **3 RESULTS AND DISCUSSION**

#### **3.1 SURGICAL TECHNIQUES: CONVENTIONAL VS. CONVENTIONAL LAPAROSCOPIC**

The conventional technique of orchiectomy in dogs usually involves a prescrotal incision followed by exteriorization of the testicle, ligation of the spermatic cord, and suturing of the subcutaneous and cutaneous tissues. Although effective, this method is associated with complications such as scrotal edema, bruising, wound dehiscence, and intra-abdominal hemorrhages in cases of ligation failure (Quarterone et al., 2017).

On the other hand, laparoscopic castration appears as a viable alternative, especially when associated with other intra-abdominal procedures. An innovative technique uses high-frequency bipolar forceps with integrated scissors (such as RobiPlus), allowing simultaneous coagulation and cutting of the vas deferens and vascular plexus without the need for metal or plastic clips (Quarterone et al., 2017). Comparative studies demonstrate that the laparoscopic approach results in lower pain scores (assessed by the UMPS scale) and lower serum and salivary cortisol concentrations in the immediate postoperative period, indicating a significant reduction in surgical stress (Tavares et al., 2021; Quarterone et al., 2017).

In addition, laparoscopic castration is very useful when combined with other procedures, such as cytopexy, deferentopexy, colopexy and gastropexy, as it allows a wide view with access to pelvic organs and tissues. Another promising factor is that it can be applied in cases of cryptorchidectomy and neoplastic testes in dogs and as an option for mass sterilization programs in urban and industrial areas with a large population. In addition, the surgery time between the two techniques does not present a significant difference (Tavares et al., 2021; Quarterone et al., 2017).

#### **3.2 CLINICAL MANAGEMENT AND POSTOPERATIVE ANALGESIA**

Analgesic management in canine orchiectomy often uses preemptive



administration of NSAIDs, such as meloxicam (0.1 mg/kg to 0.2 mg/kg), associated with opioids such as fentanyl or tramadol in the intraoperative period. It has been observed that male dogs undergoing orchiectomy require fewer rescue analgesia interventions when compared to females undergoing ovariohysterectomy, although monitoring for at least 4 hours after extubation is recommended to ensure the correct diagnosis of pain (Angrimani et al., 2020; Quarterone et al., 2017).

The systemic inflammatory response, as measured by C-Reactive Protein (CRP), peaks about 24 hours after surgery. Laparoscopic procedures tend to have significantly lower CRP levels compared to the open technique after one week, confirming less tissue trauma (Angrimani et al., 2020; Quarterone et al., 2017).

### 3.3 THERMOREGULATION AND ANAESTHESIA

Maintaining body temperature is a critical factor, since general anesthesia inhibits tonic thermoregulatory vasoconstriction. Approximately 40% of anesthetized dogs develop some degree of hypothermia. Dogs undergoing orchiectomy have an initial heat loss after induction, but tend to maintain more stable core temperatures than females, possibly due to the smaller trichotomy area and often reduced surgical time (Angrimani et al., 2020; Romagnoli, 2025). The use of active heating devices, such as water-heated mats and forced-air blankets, is essential to mitigate heat loss through radiation and convection.

### 3.4 LONG-TERM HEALTH IMPLICATIONS

Orchiectomy promotes a drastic reduction in testosterone and dihydrotestosterone (DHT) levels, which leads to progressive prostatic atrophy. In dogs with BPH, the reduction in prostate volume can reach 67% in 60 days post-surgery, accompanied by a decrease in vascular endothelial growth factor (VEGF-A) expression and local vascularization (Angrimani et al., 2020; Quarterone et al., 2017; Wenham and Santos, 2021).

However, the timing of surgery must be carefully planned. Castration before puberty (especially pediatric, between 6 and 16 weeks) can delay the closure of bone growth plates, increasing the incidence of cranial cruciate ligament tears and hip dysplasia in large breeds. Additionally, breeds such as the Golden Retriever have a higher risk of developing hemangiosarcoma and lymphoma after gonadectomy.



Therefore, the current recommendation suggests postponing the procedure in dogs of predisposed breeds until skeletal maturity is reached.

#### 4 CONCLUSION

Orchiectomy in dogs remains one of the most important and frequent surgical procedures in the veterinary clinic routine, presenting relevant benefits for reproductive control, prevention of andrological conditions and reduction of unwanted behaviors. From the studies analyzed, it was possible to observe that the conventional technique continues to be widely used due to its efficacy and safety, although it may be associated with postoperative complications, such as edema, hematomas, and greater discomfort in the recovery period.

On the other hand, laparoscopic techniques have gained prominence for presenting less tissue trauma, reduction of postoperative pain and faster recovery, representing a promising alternative in modern veterinary surgery. In addition, adequate analgesic management and maintenance of thermoregulation during the perioperative period were essential for the recovery of patients and for the reduction of anesthetic complications.

Another relevant aspect identified in the literature refers to the need for individualized evaluation as to the ideal time to perform gonadectomy, especially in large breeds, in which early castration may be related to the development of orthopedic and neoplastic alterations.

Thus, it is considered that the success of orchiectomy is not only related to the technical execution of the procedure, but also to the surgical planning, the choice of the most appropriate technique and the correct conduct of postoperative care, aiming to ensure greater safety, well-being and quality of life for the animals undergoing surgery.

#### REFERENCES

- Angrimani, D. S. R., et al. (2020). Prostatic hyperplasia: Vascularization, hemodynamic and hormonal analysis of dogs treated with finasteride or orchiectomy. *PLoS ONE*, 15(6), e0234714.
- Quarterone, C., et al. (2017). Ovariohysterectomy requires more post-operative analgesia than orchiectomy in dogs and cats. *Canadian Veterinary Journal*, 58(11), 1191–1194.
- Romagnoli, S. (2025). When – and whether – should we spay/neuter companion dogs. *Journal of Small Animal Practice*, 66(11), 761–766.



Tavares, I. T., et al. (2021). Laparoscopic castration using bipolar forceps vs. orchiectomy in dogs: A comparison of two techniques. *Animals*, 11(11), 3041.

Wenham, N., & Santos, L. C. P. (2024). The effects of general anaesthesia on body temperature of dogs subjected to ovariohysterectomy or orchiectomy performed by veterinary students in a teaching hospital. *The Veterinary Journal*, 308, 106252.