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CASE REPORT

Testicular Necrosis Following Orchitis in a Rabbit: A Case Report

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ABSTRACT

This case report presents a rare clinical presentation of testicular necrosis associated with orchitis and funiculitis in a 9-year-old intact male Holland Lop rabbit. The rabbit was presented to the Animal Hospital of Bursa Uludağ University with bilateral scrotal swelling, pain, erythema, and multiple perineal abscesses. Ultrasonographic examination revealed marked testicular enlargement, heterogeneity, and hydrocele. Despite initial antimicrobial and anti-inflammatory therapy, inflammation extended to the spermatic cord. Bilateral orchiectomy was performed using the closed castration (scrotal ablation) method after stabilization. Histopathology confirmed necrosis in the left testis, chronic orchitis in the right testis, and severe funiculitis. The rabbit recovered uneventfully and remained asymptomatic during five months of follow-up. The animal died 15 months postoperatively due to multiple organ failure secondary to age-related complications. This case emphasizes the importance of timely surgical intervention in progressive testicular infections to prevent irreversible tissue damage.

Key Words: Funiculitis, Orchiectomy, Orchitis, Rabbit, Testicular necrosis

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Bir Tavşanda Orchitis Sonrası Testiküler Nekroz: Olgu Sunumu

ÖZ

Bu olguda, 9 yaşında, kısırlaştırılmamış erkek Holland Lop ırkı bir tavşanda görülen orchitis ve funiculitis' e bağlı nadir bir testiküler nekroz vakası sunulmaktadır. Tavşan, Bursa Uludağ Üniversitesi Hayvan Hastanesi'ne bilateral skrotal şişlik, ağrı, eritem ve çok sayıda perineal apse şikayetleriyle getirildi. Ultrasonografik incelemede belirgin testiküler büyüme, heterojenite ve hidrosel tespit edildi. Başlangıçta uygulanan antimikrobiyal ve antiinflamatuar tedaviye rağmen inflamasyon spermatik kordu tutacak şekilde ilerleme gösterdi. Stabilizasyonun ardından, kapalı kastrasyon (skrotal ablasyon) yöntemi ile bilateral orşiektomi uygulandı. Histopatolojik incelemede sol testiste nekroz, sağ testiste kronik orşitis ve şiddetli funikülit saptandı. Tavşan, ameliyat sonrası dönemde komplikasyonsuz şekilde iyileşti ve beş aylık takip sürecinde herhangi bir klinik belirti göstermedi. Operasyondan 15 ay sonra, yaşa bağlı gelişen çoklu organ yetmezliği nedeniyle hayatını kaybetti. Bu olgu, ilerleyici testiküler enfeksiyonlarda geri dönüşümsüz doku hasarını önlemek adına zamanında cerrahi müdahalenin önemini vurgulamaktadır.

Anahtar Kelimeler: Funiculitis, Orşiektomi, Orchitis, Tavşan, Testiküler nekroz

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INTRODUCTION

Specific reports of testicular inflammation and necrosis in rabbits are scarce. Nevertheless, infectious diseases remain a significant cause of morbidity and mortality in pet rabbits. Recent comprehensive studies have identified various infectious agents, including *Encephalitozoon cuniculi*, as major contributors to mortality in this species (Doboşi et al. 2024; Espinosa García-San Román et al. 2024). These findings underscore the clinical relevance of infectious diseases in rabbits and the critical importance of early recognition and management of systemic infections. Testicular inflammation and necrosis are rarely reported in rabbits but can pose significant clinical challenges when they occur (Maxie 2016). Orchitis and funiculitis may develop as sequelae to bacterial infections or trauma, and if left untreated, can progress to ischemic testicular necrosis (Sarierler and Kılıç 2003; Suciu et al. 2017). Among lagomorphs, interstitial cell tumors are the most commonly reported testicular disorders, while inflammatory conditions are less frequent but potentially life-threatening (Irizarry-Rovira et al. 2008; Reineking et al. 2019). Delayed diagnosis and intervention in such cases can result in irreversible tissue damage, systemic illness, and sepsis (Maxie 2016). However, documented clinical reports detailing the progression and surgical management of severe testicular infections in rabbits remain scarce in the veterinary literature (Bertram et al. 2021; Reineking et al. 2019). This case report aims to describe a rare presentation of testicular necrosis associated with orchitis and funiculitis in a rabbit, highlighting the importance of early diagnosis and timely surgical intervention to prevent life-threatening complications.

CASE HISTORY

A 9-year-old intact male Holland Lop rabbit (*Oryctolagus cuniculus*), weighing 3 kg, was presented to the Veterinary Hospital of Bursa Uludağ University with a history of hindlimb lameness, chronic diarrhea, and swelling in the scrotal and perineal regions. General clinical examination revealed poor body condition and hyperemic mucous membranes, with no other abnormalities noted. On clinical examination, both testicles were markedly enlarged, warm, erythematous, and painful on palpation. The scrotum appeared diffusely reddened. The left testis measured approximately 7 × 3 cm, while the right was 2 × 1 cm. Multiple abscesses were detected in the perineal area and around the testes (Figure 1). Inguinal lymph nodes were bilaterally enlarged. Pathogen isolation and identification were also not performed, as the owner declined these additional diagnostic procedures due to financial limitations.

Figure 1: Bilateral testicular enlargement, predominantly on the left side (white star), accompanied by multiple abscess foci in the perineal region and around the testes.

Ultrasonographic evaluation of both testicles was performed using a high-frequency (7.5 MHz) linear probe (Figure 2). The left testis was markedly enlarged, displayed a heterogeneous echotexture with multiple anechoic regions, and lacked a visible mediastinum testis—no echogenic linear structure was identified within the testicular parenchyma. Additionally, a hydrocele was detected as an anechoic fluid accumulation in the intrascrotal space. Transverse and sagittal sonographic images confirmed loss of normal architecture in the left testis. The epididymis appeared enlarged and exhibited mixed echogenicity.

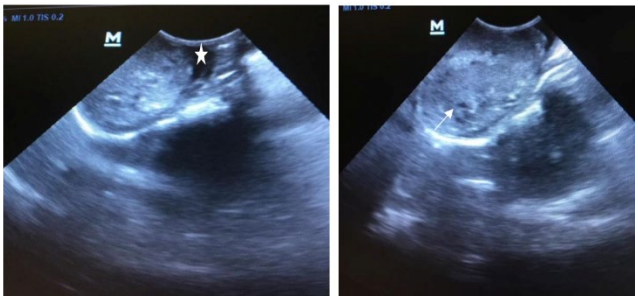

Figure 2: Ultrasonographic image of the left testicle showing marked enlargement, heterogeneous echotexture, and multiple anechoic areas (white arrows). The mediastinum testis is not visualized. A hydrocele is present, evident as an intrascrotal anechoic fluid accumulation (white star).

The affected area was cleaned and compressed using warm povidone-iodine solution (Batticon®, Adeka, Samsun, Türkiye). Enrofloxacin (Baytril-K®, Bayer, Istanbul, Türkiye; 10 mg/kg, s.c.) and cefazolin sodium (Iespor®, I.E. Ulagay Co., Istanbul, Türkiye; 20 mg/kg, s.c.) were administered once daily for 10 consecutive days. As an anti-inflammatory agent, flunixin meglumine (Flumeglin®, Teknovet, Istanbul, Türkiye; 1.1 mg/kg, s.c.) was administered once daily for three days. After the abscesses matured, they were drained via puncture and irrigated. Once the local

inflammation and testicular swelling regressed, a surgical appointment was scheduled. However, due to a delay in scheduling by the owners, the inflammation extended to the spermatic cord (funiculus spermaticus). The rabbit returned with worsening general condition and lameness. Antibiotic and anti-inflammatory treatments were repeated, and after one week, clinical improvement was observed. Bilateral orchiectomy was then scheduled under general anesthesia.

Premedication was performed with xylazine (Basilazin® 2%, Bavet, Istanbul, Türkiye; 4 mg/kg, i.m.). Ten minutes later, ketamine hydrochloride (Alfamine® 10%, Alfasan, Woerden, The Netherlands; 35 mg/kg, i.m.) was administered for induction. An intravenous catheter was placed into the lateral auricular vein, and preventive antibiotherapy with enrofloxacin (Baytril-K®, Bayer, Istanbul, Türkiye; 10 mg/kg, i.v.) and preemptive analgesia with meloxicam (Metacam®, Boehringer Ingelheim, Ridgefield, CT, USA; 1 mg/kg, i.v.) were administered. Anesthesia was maintained with a combination of diazepam and ketamine administered intravenously. The rabbit was positioned in dorsal recumbency, and the surgical site was shaved and aseptically prepared. Bilateral orchiectomy was performed using the closed castration (scrotal ablation) method. The inflamed spermatic cord was excised as extensively as possible. The subcutaneous tissue was closed with continuous simple sutures, and the skin was closed with interrupted simple sutures using 2-0 Vicryl absorbable suture material. Both testes were submitted for histopathological examination, which confirmed the presence of severe testicular necrosis.

Gross examination showed the left testis to be enlarged, firm, and discolored. The spermatic cord appeared thickened and congested (Figure 3). Histopathological evaluation revealed: Left testis: widespread coagulative necrosis, hemorrhage, tubular degeneration, and absence of active spermatogenesis. Right testis: chronic interstitial orchitis with infiltration of lymphocytes and macrophages. No evidence of neoplasia was found in either testis.

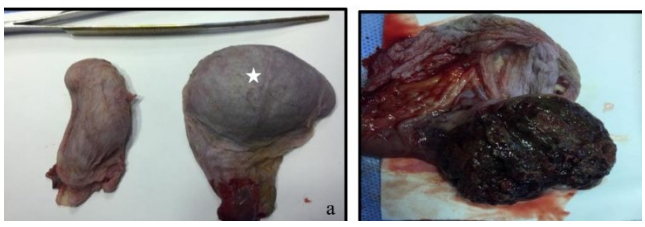

Figure 3: Macroscopic postoperative view of the excised testes (a-b). The left testis appears markedly enlarged (white star), firm, and discolored, while the right testis is smaller but inflamed.

Postoperative recovery was uneventful. Within two weeks, the rabbit regained normal appetite, mobility, and coat condition. During the first five months of follow-up, no recurrence or systemic signs were observed, and the animal maintained stable clinical health. Periodic abdominal ultrasonography was recommended. Unfortunately, the rabbit died 15 months after the surgery due to multiple organ failure associated with age-related complications. No signs of recurrence or metastasis related to the previous testicular pathology were observed prior to death.

DISCUSSION

Pet rabbits, increasingly popular worldwide as companion animals, can harbor various zoonotic pathogens—including parasites (e.g., *Encephalitozoon cuniculi*), viruses (hepatitis E), bacteria (e.g., *Bartonella spp*., *Pasteurella spp.*), and fungi. In rabbits, systemic bacterial infections such as pasteurellosis are known to predispose to abscess formation and reproductive tract inflammation, including orchitis and funiculitis, which may progress if not promptly managed (Fernández et al. 2023; College of Veterinary Medicine, University of Missouri n.d.). In the present case, however, pathogen isolation was not performed as the owner declined additional diagnostic tests. While the initial signs—such as perineal abscesses, scrotal erythema, and testicular swelling—often indicate localized infection, the ascending spread of inflammation to the spermatic cord (funiculitis) can lead to vascular compromise and subsequent ischemic necrosis. Similar mechanisms of inflammation-induced ischemia have been documented in other species, where prolonged or inadequately treated infections result in coagulative necrosis and irreversible parenchymal damage (Zachary and McGavin 2012; Varga 2014). In the present case, a severe bilateral inflammatory condition evolved into unilateral testicular necrosis due to a delay in surgical intervention. Despite initial antimicrobial and anti-inflammatory treatment, the infection extended from the perineal region to the spermatic cord, compromising blood flow to the left testis. This progression underscores the critical importance of early recognition and timely surgical management in preventing irreversible testicular damage in lagomorphs.

Ultrasonographic findings in the present case supported the clinical suspicion of severe testicular pathology. The absence of mediastinum testis, heterogeneous parenchymal echotexture, and hydrocele indicated significant tissue disruption. Such ultrasonographic features are considered consistent with testicular degeneration or necrosis, and in this case, histopathological confirmation revealed widespread necrosis, tubular degeneration, and a complete absence of spermatogenesis in the affected testis. The concurrent diagnosis of chronic orchitis and funiculitis in the contralateral testis and spermatic cord, respectively, reflects the extent and chronicity of the inflammatory process.

Interestingly, while testicular neoplasms remain the most frequently reported testicular pathologies in rabbits, particularly in aging, intact males (Heatley and Smith 2004; Reineking et al. 2019), this case demonstrated a purely inflammatory etiology without any evidence of neoplastic transformation. This distinction is crucial, as early clinical signs in such cases can mimic testicular tumors, leading to delayed or inappropriate therapeutic approaches.

The outcome of this case underlines the importance of timely diagnosis and definitive surgical intervention. The rabbit exhibited full recovery following bilateral orchiectomy and remained clinically stable for five months but died 15 months postoperatively due to multiple organ failure secondary to age-related complications. The absence of recurrence or systemic illness supports the effectiveness of surgical castration in resolving advanced testicular infections when performed promptly.

This case contributes to the limited literature on inflammatory testicular disease in rabbits and emphasizes the need for early therapeutic intervention in similar clinical scenarios. It also highlights the diagnostic value of ultrasonography in differentiating between neoplastic and non-neoplastic testicular conditions in lagomorphs, aiding timely and appropriate clinical decision-making.

CONCLUSION

This case report highlights an unusual but clinically significant progression of testicular inflammation in a pet rabbit, resulting in unilateral testicular necrosis and funiculitis. The findings support the necessity of timely surgical management in severe scrotal infections, and the five-month disease-free interval followed by natural death at 15 months postoperatively suggests successful resolution.

A limitation of the present case is that pathogen isolation and hematological examination could not be performed because the owner declined additional diagnostic tests, limiting both the identification of the causative agent and the assessment of systemic involvement.

Conflict of interest: The author have no conflicts of interest to report.

Authors' Contributions: The author conceived the study, designed and conducted the experiments, collected and analyzed the data, and wrote and critically revised the manuscript. The author approved the final version of the manuscript.

Ethics Committee Information: This study does not fall under the scope requiring HADYEK approval, as outlined in Article 8(k) of the "Regulation on the Working Procedures and Principles of Animal Experiments Ethics Committees." All data, findings, and materials presented in this report were obtained in compliance with academic integrity and ethical standards.

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