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Inguino-Scrotal Hernia with Intestinal Loop Strangulation in a Dog: Case Report

Hérnia Inguino-Escrotal com Estrangulamento de Alça Intestinal em um Cão: Relato de Caso

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Abstract

Inguino-scrotal hernia is a condition more commonly observed in young, male, and intact dogs. It is characterized by the protrusion of a portion of tissue, such as viscera or omentum, through the inguinal canal, resulting in scrotal enlargement. The condition is often associated with hormonal influence, which may increase the inguinal canal vulnerability. Diagnosis is clinical, based on local palpation, and confirmed by ultrasonography, which identifies the presence of the hernia and the herniated contents. Depending on the structures involved, emergency surgery may be required to prevent complications such as vascular strangulation, testicular necrosis, and sepsis. Surgical treatment involves herniorrhaphy, often combined with orchiectomy, due to compromised testicular vascularization. The prognosis is variable, depending on the herniated content and the timeliness of diagnosis and surgical intervention.

Keywords: Inguinal ring. Enterectomy. Male.

Resumo

A hérnia inguino-escrotal é uma afecção mais comum em cães jovens, machos e não castrados. É caracterizada pela protrusão de uma porção de tecido, podendo ser vísceras ou omento, que se projetam através do canal inguinal, resultando em aumento de volume escrotal. A condição está frequentemente associada à influência hormonal, podendo aumentar a vulnerabilidade do canal inguinal. O diagnóstico é clínico, baseado em palpação local, e confirmado com auxílio da ultrassonografia, identificando a presença da hérnia e do conteúdo herniado. De acordo com a estrutura envolvida, deve ser realizado cirurgia emergencial, evitando maiores complicações como estrangulamento vascular, necrose testicular e sepse. O tratamento cirúrgico consiste em herniorrafia, associada a orquiectomia, devido ao comprometimento da vascularização testicular. O prognóstico é variável, dependendo do conteúdo herniado, da precocidade do diagnóstico e intervenção cirúrgica.

Palavras-chave: Anel Inguinal. Enterectomia. Macho.

1 Introduction

Hernias are characterized by the protrusion of viscera or other organs through natural openings or acquired orifices, referred to as hernial rings, which correspond to points of tissue rupture. The herniated structure consists of the contents - represented by abdominal viscera - and the hernial sac, formed by a fold of the peritoneum (Pozzobon *et al*., 2021; Schossler, 2013).

In domestic animals, hernias are classified according to their anatomical location as diaphragmatic, inguinal, scrotal, umbilical, abdominal, hiatal, incisional, and perineal (Smeak, 2007). Among these, caudal abdominal hernias affect the inguinal, scrotal, and femoral regions and can be subdivided into direct or indirect types.

Thus, when they occur adjacent to the spermatic cord, the condition is termed scrotal hernia, inguinoscrotal hernia, or indirect inguinal hernia, and the latter is the nomenclature used for dogs (Fry, 1991; Ibanez *et al*., 2009). It is a specific and peculiar condition in male dogs with inguinoscrotal hernias, as the herniated content extends adjacent to the spermatic cord and into the scrotum (Miller, 1964).

The herniated content usually includes the omentum or falciform ligament; however, other abdominal cavity structures may also be identified depending on the extent and severity of the condition (Oliveira *et al*., 2023).

Inguinoscrotal hernias develop due to a defect in the inguinal ring, which allows the protrusion of abdominal contents into the vaginal process - a structure located adjacent to the spermatic cord - and may subsequently extend into the scrotal sac. Due to their uncommon nature, they are rare and typically unilateral, often leading to strangulation of abdominal contents (Pozzobon *et al.*, 2021).

It is known that young, non-neutered male dogs are the most affected (Vilela *et al*., 2023). The etiology remains undefined, as do the hereditary mechanisms involved (Fossum, 2019).

It is believed that both congenital anomalies and acquired factors are associated with this condition. Among the acquired factors, trauma or increased intra-abdominal pressure may predispose animals to hernia formation in weakened areas (Curti *et al*., 2012). When related to trauma, the increase in intra-abdominal pressure can displace certain viscera to the weakened site, resulting in hernia formation (Pozzobon *et al*., 2021), along with serious complications such as strangulation of intestinal loops.

Clinically, affected animals may present with pain on palpation of the scrotal region, a firm mass extending from the spermatic cord to the scrotum, abdominal pain, vomiting, anorexia, apathy, and intestinal obstruction, depending on the severity of the case (Pozzobon *et al*., 2021; Vilela, 2023). Differential diagnoses include orchitis, testicular or scrotal neoplasms, and scrotal sac edema/inflammation (Fossum, 2019).

Diagnosis is performed using ultrasonography, which allows visualization of the herniated structures, contributing to characterization of the contents and better case management (Léga; Pinto; Galvão, 2011). Treatment consists of surgical correction through herniorrhaphy, since depending on the herniated content, the condition may result in complications such as gastrointestinal obstruction and strangulation of abdominal viscera, potentially leading to necrosis, sepsis, and death (Pozzobon *et al*., 2021).

Given the rarity of the condition and the limited information available in the literature, the objective of this report was to describe the case of a young male Pug dog presenting with scrotal swelling, signs of pain, and lethargy, which was diagnosed with an inguinoscrotal hernia involving strangulation of an intestinal loop.

2 Material and Methods

A male, intact Pug dog, aged 1 year and 6 months, was admitted to a private veterinary clinic in the city of Cornélio Procópio, Paraná, presenting with complaints of pain in the scrotal sac region, lethargy, and difficulty walking after the owners witnessed a fight with another dog.

During the physical examination, the animal exhibited pain upon palpation of the scrotal sac, a marked increase in its volume (Figure 1), abdominal pain, and apathy. The patient was then referred for abdominal and testicular ultrasonography to investigate possible differential diagnoses related to

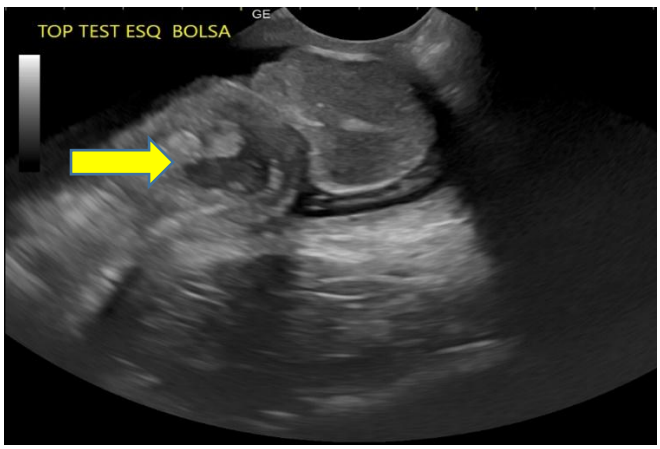
trauma.

Figure 1 - Unilateral swelling in the scrotal sac of a Pug dog

Source: the authors.

During the abdominal ultrasonographic examination, the presence of an inguinoscrotal hernia was observed, with herniated intestinal loop content (Figure 2). Additionally, cryptorchidism was identified, with the right testicle located inside the abdominal cavity. Following these findings, hematological and biochemical tests were performed as part of the preoperative evaluation, along with an electrocardiogram, to ensure the surgical procedure could be conducted safely.

Figure 2 - Yellow arrow indicating an intestinal loop displacing the testicle located in the scrotal sac. Presence of inflammatory free fluid surrounding the area



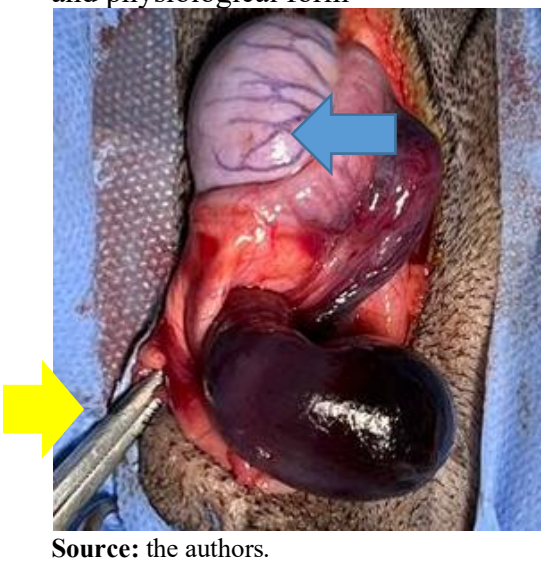
Source: the authors.

Hematological tests were within the normal limits, with a hematocrit of 41% and a platelet count of 350,000. Regarding biochemical tests, no alterations were observed, with ALT (alanine aminotransferase) at 66 U/L and creatinine at 1.1 mg/dL. The electrocardiogram showed a sinus rhythm, with an average heart rate of 141 bpm (beats per minute).

Pre-anesthetic medication was administered using methadone (0.2 mg/kg) combined with acepromazine (0.015 mg/kg) intramuscularly. Anesthetic induction was performed with intravenous propofol (3 mg/kg). Subsequently, endotracheal intubation was performed, and the animal was maintained on 100% oxygen and 1% isoflurane via inhalation until the end of the surgical procedure.

The animal underwent emergency surgery for therapeutic orchiectomy, scrotal ablation due to severe edema, and correction of the inguinoscrotal hernia. During the surgical procedure, an intestinal loop was found inside the scrotal sac, showing signs of necrosis and loss of local vascularization, along with the left testicle in its normal anatomical position (Figure 3).

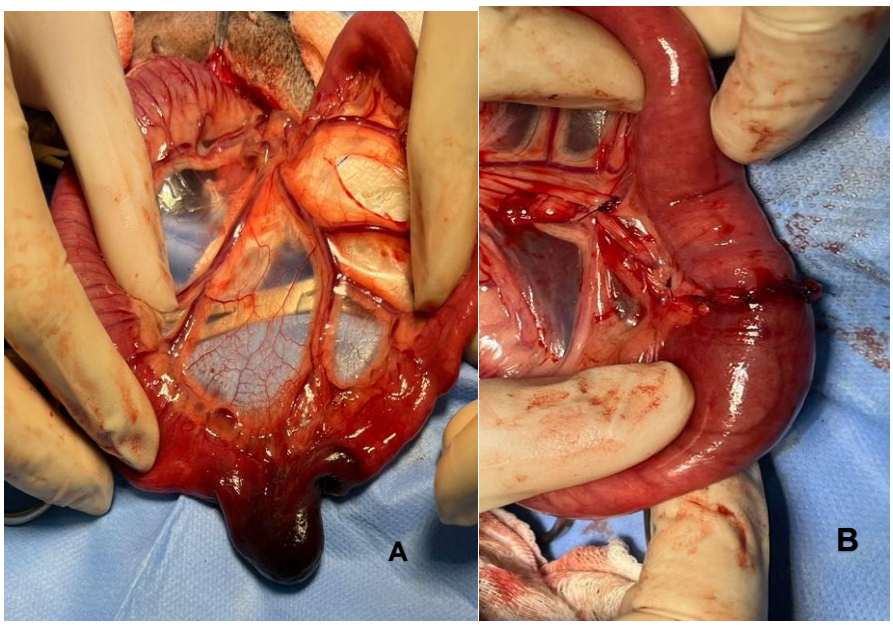
Figure 3 - Yellow arrow indicating necrotic intestinal loop with no evident vascularization. Blue arrow indicating intact testicle in its normal position and physiological form



Source: the authors.

Thus, in addition to the other surgical procedures, it was necessary to perform a partial enterectomy to remove the necrotic and nonviable portion of the intestinal loop, due to its complete compromise, rendering it nonfunctional (Figure 4).

Figure 4 - A: Enterorrhaphy of the intestinal loop after enterectomy. B: Necrotic intestinal segment due to inguinoscrotal hernia, followed by partial enterectomy



Source: the authors.

Additionally, the ectopic testicle located in the abdominal cavity also showed signs of necrosis and was removed during the same procedure. The abdominal contents were then reduced, followed by suturing and closure of the inguinal canal to prevent hernia recurrence.

At the end of the surgery, the animal remained hospitalized for 24-hour monitoring and was provided with a liquid diet in the initial hours. The patient remained stable, accepted the liquid diet during the first hours, and showed no further clinical alterations. The animal remained hospitalized for 72 hours and was discharged due to its good general condition.

Postoperative treatment included antibiotic therapy with metronidazole (15 mg/kg) in combination with enrofloxacin (5 mg/kg). As an anti-inflammatory, carprofen was administered at a dose of 4.4 mg/kg, and tramadol hydrochloride was used for analgesia at a dose of 4 mg/kg. The animal returned after 15 days for suture removal and was in good condition, with no further complications.

3 Results and Discussion

Inguinoscrotal hernias have been observed in species such as pigs, horses, and sheep (Sevillano *et al*., 2015; Queiroz *et al*., 2018; Silva *et al*., 2019). There is a notable scarcity of studies addressing the presence of inguinoscrotal hernias in dogs (Pozzobon *et al*., 2021).

When they really occur, they affect young, male, unneutered dogs that present clinical signs such as pain and scrotal edema (Pozzobon *et al*., 2021). This was also observed in the present case,

as the report involved a young, intact male dog brought to the clinic with clinical signs of local pain in the scrotal region.

Previous studies have described this type of herniation in Fila Brasileiro dogs at just a few months of age (Curti *et al*., 2012), as well as in a three-year-old Basset Hound (Ibanez *et al*., 2009). In this case, the condition was observed in a Pug, highlighting the breed diversity associated with the manifestation of inguinoscrotal hernias.

These hernias typically present with localized swelling, pain on palpation, and abdominal discomfort. Clinical manifestations vary depending on the herniated content, whether strangulation is present, and the duration and progression of clinical signs (Fossum, 2019; Pozzobon *et al*., 2021). In many cases, animals are asymptomatic (Johnston; Tobias, 2018). The dog in this case presented clinical signs consistent with those described in the literature.

In male dogs, unilateral hernias are more common, with a greater incidence on the left side (Oliveira *et al*., 2023). This was also the case in the present report, in which the dog exhibited a unilateral inguinoscrotal hernia on the left side.

The literature typically reports that the omentum or falciform ligament are the most common herniated contents (Oliveira *et al*., 2023). However, in this case, an intestinal loop was found, which is more commonly associated with inguinal hernias (Smeak, 2007; Vasconcelos; Freitas; Moreira, 2020).

Regarding diagnosis, ultrasound imaging is essential for identifying the herniated content (Léga; Pinto; Galvão, 2011). It was crucial in confirming the diagnosis of an inguinoscrotal hernia with strangulated intestinal loop, as observed in other studies.

It is known that in cases of inguinoscrotal hernias in dogs, orchiectomy is necessary since surgical repair of the inguinal ring may compromise the testicular blood supply, potentially leading to long-term complications (Borges *et al*., 2014). In this case, orchiectomy was considered a therapeutic surgery, due to the presence of an ectopic testicle. Therefore, both testicles were removed, and scrotal ablation was performed due to the extensive edema.

As this is an extensive and time-consuming surgery with a demanding postoperative period, intensive monitoring is required. Although studies on dogs undergoing herniorrhaphy are limited, the animals generally have a good prognosis and few surgical complications (Pinhotti *et al*., 2024). However, in this case, the patient underwent herniorrhaphy, partial enterectomy, therapeutic orchiectomy, and scrotal ablation, requiring intensive monitoring.

4 Conclusion

Inguinoscrotal hernias are conditions rarely observed in routine veterinary surgical practice. However, they should be considered as a differential diagnosis in cases of scrotal or testicular

swelling. Early identification, especially through ultrasonographic examination, is essential for indicating emergency surgical intervention and achieving a more favorable prognosis.

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