A Case Report on Surgical Management of unilateral Cryptorchidism in a Persian Cat

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A Case Report on Surgical Management of unilateral Cryptorchidism in a Persian Cat

A Clinical Report Submitted as per Approved Styles and contents

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Abstract

Cryptorchidism is a common congenital abnormality in animals, characterized by the failure of one or both testes to descend into the scrotum. This paper presents a case study involving a three-year-old Persian cat with unilateral abdominal cryptorchidism, shedding light on the diagnosis, surgical management, and postoperative care. The cat displayed clinical symptoms, including unsuccessful mating, scrotal abnormalities, aggressiveness, and chronic abdominal pain, which raised concerns about cryptorchidism. The condition's incidence can vary across cat breeds, with higher rates observed in Persian cats and Domestic Shorthairs. Diagnosis primarily involves clinical examination and palpation, with the surgeon confirming unilateral cryptorchidism in this case, where one testis remained in the abdomen. Surgical intervention was crucial to address the cat's condition. The procedures performed included abdominal cryptorchidectomy to remove the retained abdominal testis and castration for the scrotal testis. The success of these surgeries highlighted the effectiveness of traditional surgical methods in managing cryptorchidism. Postoperative care is a critical aspect of treatment. The cat was closely monitored for complications, such as sepsis, edema, hemorrhage, and exudates. Daily wound checks and the application of antiseptic cream were part of the care regimen. Antibiotics and anti-inflammatory analgesics were administered over five days to ensure a smooth recovery process. This case study underscores the importance of early diagnosis and appropriate surgical management of cryptorchidism in cats. Timely intervention not only alleviates clinical symptoms but also prevents potential complications, including chronic pain and tumor development. It is noteworthy that advancements in surgical techniques, like laparoscopy, offer minimally invasive alternatives with potential benefits, though they require specialized skills and instruments. As such, continued research and innovations in the field can further enhance the treatment of this common congenital condition in feline patients.

Keywords: Castration**,** cryptorchidism, cryptorchidectomy, Persian cat, retained testis.

Chapter 1: Introduction

Cryptorchidism, the failure of one or both testes to descend into the scrotum, is a common congenital abnormality. The testes normally descend into the scrotum at a young age in animals. In the case of cats, the testes generally descend into their proper position before birth. When the testes don't descend into the scrotum, they are retained somewhere in the lower part of the body. The incidence of feline cryptorchidism in two studies on cats presented for neutering was 1.3% in 3,806 animals over a 4.5-year period (Yates et al., 2003) and 1.8% in 1,345 cats during a 10-year period (Millis et al., 1992). The prevalence of cryptorchidism in Persian cats appeared to be higher than in other breeds (Millis et al., 1992). The undescended testes may remain in the inguinal region or within the abdomen. Cryptorchidism can occur unilaterally or bilaterally, with Yates et al. reporting that 78% of cryptorchidism cases are unilateral. Though the cause of cryptorchidism is still unknown, some evidence suggests genetic factors may play a role. Several studies propose that various genes, including the androgen receptor, calcitonin gene-related peptide, insulin-like peptide 3, and testosterone, are responsible for this condition. Retained unilateral or bilateral testes in the inguinal region or abdomen can lead to various complications in cats, such as chronic pain, twisting of the spermatic cord, and impaired blood supply to the testis (PetMD Editorial, 2022). In some cases, these testes may develop tumors, leading to feminine behavior. Diagnosis is typically accomplished through digital palpation of the scrotum, followed by confirmation through X-ray and ultrasound to determine if the retained testes are located in the inguinal region or within the abdomen. Castration of both testes is generally recommended for both unilateral and bilateral cryptorchidism (PetMD Editorial, 2022). Typically, a caudal ventral laparotomy is performed to remove the retained testes from the abdomen. Some studies suggest the use of laparoscopic techniques for minimal invasiveness and improved results. In our present case, a three-year-old Persian cat was diagnosed with unilateral cryptorchidism, with one testis remaining in the abdomen. The surgeon performed a conventional laparotomy (abdominal cryptorchidectomy) to remove the retained testis from the abdomen, and the scrotal testis was removed through castration. The cat recovered without complications within a few days.

Chapter 2: Case Presentation

2.1. Case history and observation

A three-year-old Persian male cat, weighing 4.32 kg, was presented to the Teaching and Training Pet Hospital and Research Center at Dhaka, Chattogram Veterinary and Animal Sciences University, with a history of unsuccessful mating, shrinkage of one scrotum, aggressiveness, and chronic abdominal pain. A clinical examination, including palpation, revealed the absence of one testis in the scrotum. The physical parameters, including rectal temperature, heart rate, respiration rate, color of the mucous membrane, and hydration status, were within normal ranges. Based on the clinical examination, the surgeon confirmed that the cat had unilateral cryptorchidism, with one testis retained in the abdomen.

2.2. Patient preparation and anesthesia

The surgical area was clipped to remove hair, and the surgical site was aseptically prepared using a 10% povidone-iodine solution (Povisep@, Jayson Pharmaceuticals Ltd., Bangladesh) and 70% alcohol (Fig-1). The cat received an intramuscular dose of xylazine (Xylazin@, Indian Immunologicals Ltd., India) at a dose of 1 mg/kg of body weight as a sedative. Subsequently, the animal was positioned in ventral recumbency on the operating table. Later, ketamine hydrochloride (Ketalar@, Popular Pharmaceuticals Ltd., Bangladesh) was administered intravenously at a dose of 8 mg/kg of body weight for general anesthesia. The cat was also given a 0.9% normal saline solution (NS@, ACME Laboratories Ltd., Bangladesh) intravenously at a rate of 10 ml/kg of body weight during the surgical procedure.

2.3. Surgical procedure

Abdominal cryptorchidectomy: This surgical technique is also known as caudal abdominal laparotomy (Fig-2). A ventral midline abdominal wall incision was made, situated 2 inches away from the pre-pubic region, to extract the retained testis from the abdomen (Fig-3). The abdominal testis was positioned between the kidney and the inguinal ring. The ductus deferens was identified and followed up to the level of the prostate, and the gubernaculum testis was also traced from the inguinal ring to the undescended testis. The structures were doubly ligated, and the retained testis was removed. The abdominal muscle and peritoneum were closed using Vicryl 2-0 suture material in a simple continuous pattern. Finally, the skin was closed using nylon in a simple interrupted pattern (Fig-4).

Feline castration (orchiectomy): The castration procedure involved the open, uncovered method. It began by gripping (Fig-5) the testes at the scrotum's tip and making an incision there (Fig-6). This incision exposed the testicle after cutting through the skin, dartos, and tunica vaginalis. The connection between the tunica vaginalis and the testis was separated. The vascular and avascular parts of the spermatic cord were revealed and separated. An artery forceps was applied to the vascular part near the inguinal canal opening, ligating it with Vicryl 2-0, and another artery forceps was placed below the ligature. The spermatic cord was cut 2cm below the ligature, and the testicle was removed. After confirming no bleeding, the upper artery forceps was removed, and any blood was cleaned with gauze. The scrotal skin was not sutured, and an antiseptic cream (Oint.Viodin®) was applied to the incision site (Fig-7).

2.4. Post-operative care

The wounds were checked daily for sepsis, edema, hemorrhage and exudates. Antiseptic cream (Oint.Viodin®) was applied daily on the incision site. Antibiotic (Inj.Topcef®) and anti-inflammatory analgesic (Inj. Melvet®) were administered intramuscularly for five successive days.

Chapter 3: Result

The surgery was a success, and the cat woke up from anesthesia without any issues. The procedure was efficient and didn't take much time. There was minor bleeding from the skin incision. The cat fully regained consciousness within 24 hours. Throughout the post-operative period, there were no complications such as bleeding, swelling, edema, or exudates. The wound healed completely in 10 days.

Fig-1: Surgical site preparation (hair removal and asepsis)

Fig-2: Site for caudal abdominal laparotomy

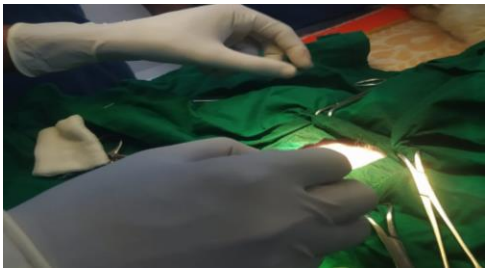

Fig-3: Ventral midline abdominal wall incision

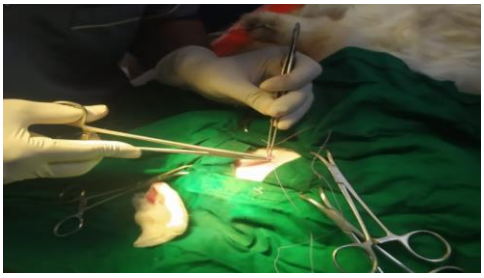

Fig-4: Closing of abdominal wall with nylon

Fig-5: Gripping of scrotum for castration

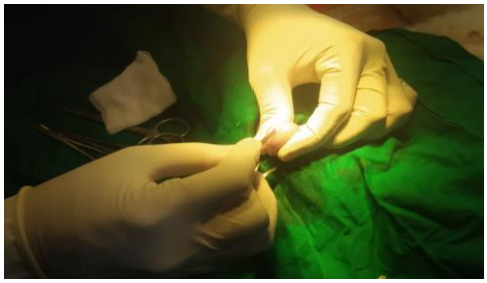

Fig-6: Scrotal wall incision

Fig-7: Application of antiseptic cream after surgery

Chapter 4: Discussion

Cryptorchidism is a common congenital condition in which genetic, epigenetic, and environmental factors all play a role (Roca-Ferrer et al., 2014). A study revealed that the rate of cryptorchidism was 1.3% in tomcats. The highest incidences were observed in Turkish Angora and Persian cats, both of which had an 18.2% occurrence (Ali et al., 2022). The second most affected breed was Domestic Shorthair cats, representing 9.1% (Ali et al., 2022).

However, the location of the cryptorchid testes varied. Typically, two areas were identified where retained testicles were found: intra-abdominal and the inguinal region (the area between the thigh muscles and the ventral midline), directly under the skin. In tomcats, all cases suffered from intra-abdominal cryptorchidism, except for one case in the Turkish Angora breed that had inguinal cryptorchidism (Ali et al., 2022). The descent of the testes into the scrotum occurs in three phases: abdominal translocation, trans-inguinal migration, and inguino-scrotal migration (Amann and Veeramachaneni, 2007). Various genes, including the androgen receptor, calcitonin gene-related peptide, insulin-like peptide 3, and testosterone, are responsible for this process (Amann and Veeramachaneni 2007; Meyers-wallen 2009). The position of a cryptorchid testis is influenced by the phase of descent that is affected. This condition can be identified at various ages, ranging from 8 months to 60 months old (Ali et al., 2022).

In the case discussed in this study, a cat had unilateral abdominal cryptorchidism, meaning one testis was found in the scrotal sac. Traditionally, intra-abdominal testes were removed through a conventional laparotomy, as we did in this case, or through minimal laparotomies with the use of a spay hook (Miller et al., 2004). These procedures carried potential complications, such as trauma to the abdominal structures. Typically, a caudal midline laparotomy is required to locate the testes, either by following the testicular artery, starting at the level of the fourth lumbar vertebra, or by tracing the deferent duct from the prostate or the gubernaculum from the inguinal ring (Brukner et al., 2015). The location of intra-abdominal testes may vary depending on the patient's position or bowel peristalsis since they are more mobile than ovaries.

Some studies suggest performing laparoscopic or laparoscopic-assisted surgery for a minimally invasive approach (Villalobos-Gomez et al., 2023). Although laparoscopy yields better results than conventional laparotomy, it requires specialized laparoscopic instruments and a skilled surgeon.

Chapter 5: Conclusion

Cryptorchidism is a relatively common congenital condition in cats, and its management is crucial to prevent associated complications. In this case, we successfully treated a Persian cat with unilateral abdominal cryptorchidism. The surgical procedures, including abdominal cryptorchidectomy and castration, were effective in resolving the condition without any postoperative complications.

Early diagnosis, proper surgical intervention, and postoperative care are essential for the well-being of cryptorchids cats. This case study underscores the significance of prompt diagnosis and appropriate surgical management to ensure the health and comfort of affected feline patients. Further research and advancements in surgical techniques may continue to improve the treatment of cryptorchidism in cats.

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