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Case Report

Abdominal Herniation of the Left Kidney in a Cat and Its Surgical Treatment: A Case Report

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ABSTRACT

A 4-year-old crossbreed female cat, weighing 4.2 kg, was brought to the Animal Hospital of the Dicle University with a complaint of swelling in the left dorsolateral abdomen. Palpable, painless, and walnut-sized swelling in the left dorsolateral region of the abdomen had occurred after high-rise syndrome one year ago, guided by the anamnesis and old radiological images. As a result of the detailed clinical and radiographic examination, it was determined that osteosynthesis with cerclage wire was performed on the left corpus ilium in a private clinic, and there was an organ herniation as a swelling of the left dorsolateral region abdomen. It was decided that the case was stable according to physiological and laboratory examinations and would be removed operatively, and the surgery was planned. A skin incision was applied over the mass, the subcutaneous connective tissue was carefully cut under guidance, and the herniated kidney was examined macroscopically. There was no strangulation, and the herniated kidney was repositioned into the retroperitoneum. As a result, herniation of the kidney in abdominal dorsolateral hernias is a rare case. This case report will contribute to our colleagues in the clinical field to be more careful about abdominal hernias resulting from trauma.

Keywords: Cat, herniorrhaphy, kidney, traumatic abdominal hernia

INTRODUCTION

Traumatic abdominal wall hernias (TBWH) are defined as the protrusion of one or more abdominal organs through a defect in the abdominal wall due to trauma. The most common causes include blunt trauma, such as high-rise syndrome, traffic accidents, and ballistic or bite wounds. In cats, abdominal wall rupture is commonly known as prepubic, paracostal, inguinal, and dorsolateral (muscles torn from the transverse processes of the lumbar vertebrae) (1, 2). A comprehensive clinical examination and diagnostic imaging are essential criteria (3). Determining the etiology, abdominal wall rupture is often associated with concurrent injuries and complications (4). After initial stabilization and a thorough physical examination, laboratory tests (urinalysis, complete blood count, and measurements of total protein, albumin, and electrolytes) should be conducted to assess any potential organ dysfunction. Radiographs and ultrasound examinations can aid in evaluating concurrent injuries, such as fractures, diaphragmatic rupture, ascites, and pulmonary contusions (5).

The most common clinical signs in abdominal wall tear cases include subcutaneous swelling, ecchymosis, or asymmetry in the abdominal contour. However, in some cases, swelling may not be noticeable until several days (up to 6 days) post-trauma when abdominal contents progress through the hernia (3, 6). Due to clinical symptoms, the veterinarian may overlook abdominal wall rupture and other injuries. In a study by Shaw et al. (2) involving 36 cats and dogs, five cases (4/26 dogs and 1/10 cats) had traumatic abdominal hernias that were not diagnosed until 24 hours after hospitalization, leading three cases to undergo orthopedic surgery without detecting abdominal defects. This highlights the difficulty of diagnosing traumatic abdominal defects in animals with multiple traumatic injuries (2).

This study aims to present the operative treatment and postoperative follow-up of a chronic case of a cat that underwent osteosynthesis for an ilium fracture in a private clinic after a fall from height but whose dorsolateral abdominal hernia remained undiagnosed.

CASE HISTORY

The material of this study was a 4.2 kg weight, 4-year-old crossbreed female cat brought to the Animal Hospital of the Faculty of Veterinary Medicine, Dicle University, with a complaint of swelling in the abdominal dorsolateral region. The patient's owner was informed about the case, and a consent form was obtained after being informed about the surgery. In the anamnesis, it was learned that she had fallen from the 5th floor 1 year ago and had an orthopedic surgery, as well as an OVH (ovariohysterectomy) 6 months ago. Since the detected swelling was in the dorsolateral part of the abdomen, it was learned that this swelling sometimes grew to the extent that it could be seen with the eye after falling from a high-rise syndrome. Still, it was usually felt by hand and rejected by palpation. While no negative findings were encountered regarding the patient in routine clinical examinations, it was determined that the swelling on the left side could be rejected by palpation. The radiographic ventro-dorsal (V/D) images showed that the kidney was herniated on the left side of the abdomen, and the osteosynthesis of the corpus ilium fracture was performed with a cerclage wire. As a result of clinical and radiographic examinations, it was observed that the fracture fragment healed despite the malunion, and there was a very slight lameness, while the hernia was seen in the radiograph (Figure 1).

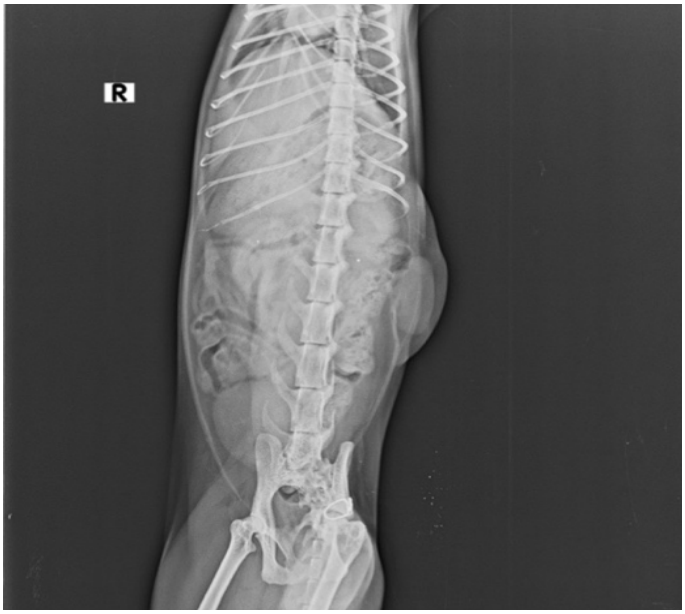

Figure 1. The image taken from the patient owner from 1 year ago, the red arrow shows the herniation of the left kidney, and the blue arrow shows the osteosynthesis of the corpus ilium fracture

The case was stable according to physiological and laboratory examinations, and the chronic hernia of the preliminary diagnosis was operatively removed. In planning the surgery, the patient was subjected to 8-hour fasting and 2-hour water restriction. Before the surgery, Metacam (20 mg/ml Boehringer meloxicam) 0.5 mg/kg S/C was administered, and the surgical area was prepared aseptically. A prophylactic antibiotic, Cefazolin sodium 20-22 mg/kg I/V, was administered during the operation. Anesthesia protocol for the surgical procedure was established with medetomidine (40 mcg/kg) as a pre-anesthetic agent, propofol (3 mg/kg/IV) for induction, and isoflurane (2-2.5%) for inhalation anesthesia was completed with 100% oxygen. In addition, butorphanol tartrate, an opioid product used in routine cat and dog anesthesia, was applied at 0.2 mg/kg/IV for analgesia in pre-anesthetic anesthesia planning.

A skin incision was made on the mass, and the subcutaneous connective tissue was carefully cut under guidance. Afterward, it was realized that the herniated content was the kidney. The adhesions were carefully separated, and a detailed examination was performed to evaluate the kidney tissue macroscopically (Figure 2). We determined that there was no strangulation, and the kidney was placed in its position. The hernia hole was closed using the polydioxanone (USP: 2/0) inversion (Halstead) suture method (Figure 3). Subcutaneous

Figure 2. The incision line made on the mass and the image of the left kidney.

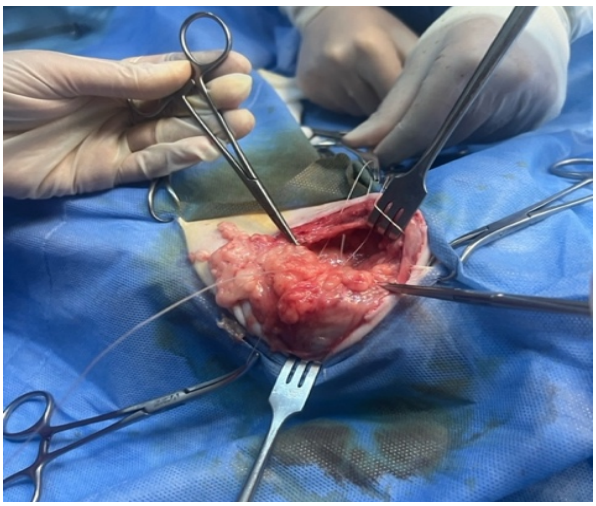

Figure 3. Halsted suture method used to close the area

connective tissue was closed using polyglycolic acid (USP: 2/0), and then the skin was closed with simple separate sutures using polyglycolic acid (USP: 2/0). After the surgery was performed and the hernia removed, a control X-ray was taken to check the condition of the hernia (Figure 4). For the postoperative period, amoxicillin/clavulanic acid (Synulox Pfizer) was applied at 20 mg/kg/IM for 5 days.

Figure 4. Control radiography image taken in the post-operative period

DISCUSSION

Traumatic body wall hernias (TBWH) are serious, life-threatening problems that occur after severe trauma in pets and can cause damage of varying severity in multiple areas in the same case. They usually occur as a result of blunt trauma or complications of surgical operations. Common locations of traumatic hernias include ventral hernias due to prepubic tendon rupture, dorsolateral hernias due to muscle rupture from the lateral processes of the lumbar vertebrae, and lateral hernias due to bite wounds or vehicle trauma (7-9). In the current study, the hernia is thought to occur due to muscle ruptures from the lateral part of the left lumbar vertebrae. Especially in 75% of traumatic cases after falling from high syndrome, there are other significant injuries (2, 10). In a study of 36 cases by Shaw et al. (2), abdominal hernias were diagnosed in five cases 24 hours after hospitalization. This report describes a rare case of traumatic chronic abdominal dorsolateral herniation of the kidney. In this study, clinical and radiographic evaluations and the anamnesis indicated that the hernia resulted from a fall from height over a year ago. The orthopedic surgery, conducted in a private clinic, involved osteosynthesis with cerclage wire for an ilium fracture, but the abdominal hernia remained undetected.

In a study of 10 cases of traumatic abdominal hernia in cats, 60% of the cats were male, 40% were due to bite injuries, 18% of the hernias were in the lateral paralumbal region, and the most frequently herniated organs were reported to be the omentum (50%), small intestines, and bladder (2). In the presented case, the cat was female and there was a dorsolateral hernia of the abdominal region accompanied by a corpus ilium fracture due to falling from a high-rise syndrome. It was determined that the herniated organ was the kidney, which is very rare, and there was no strangulation, incarceration, strangulation, adhesion, or loss of function due to the structure of the anatomical region of the chronic hernia.

When trauma occurs in animals, it is seen as the organ affected by the kidneys. A retrospective technique was performed by Shaw et al. (2) on traumatic wicks of the body wall in 26 dogs and 10 cats; only one case in the lines was affected in the examination, and everything could result in kidney rupture from the wounds due to deterioration. However, Andrade et al. (11) recently published a case study in which they interpreted the case kidney eventration as similar to our study and emphasized that it is very rare.

In reducible hernias, a local approach over the hernia ring is sufficient. A large skin area should be prepared aseptically because the hernia ring is usually much further away than can be estimated by palpation. Suture placement is more important than the type or pattern of suture for successful herniorrhaphy. Generous biting of healthy tissue is necessary (12). Slowly absorbable or non-absorbable mattress sutures that distribute tension are ideal (12, 13). Depending on the size and tension of the defect, muscle flaps or synthetic meshes may be used (14). In this case, a single incision over the mass was sufficient due to the anatomical location and size of the swelling, and no flap or synthetic mesh was required. Unlike most traumatic hernias, the herniated kidney was within the incision boundaries, eliminating the need for incision extension. Examination of the herniated kidney showed no lacerations, hematomas, torsion, or infarction, negating the need for nephrectomy.

As a result, it should not be forgotten that, especially in patients exposed to multiple trauma, in addition to orthopedic or neurological disorders, conditions such as abdominal wall hernia may also occur. In addition, in abdominal hernias, the herniated organ is often the omentum, intestines, urinary bladder, or uterus. At the same time, in rare cases, it has been observed that the kidney may also herniate. Therefore, it was thought that this case report of surgical treatment results would contribute to clinical practice.

DECLARATIONS

Availability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author (NS).

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Ethical Statement: The necessary information about the operation was given to the patient's relative and a consent form was obtained.

Competing Interests: The authors declare that there is no competing of interest regarding the publication of this article.

Declaration of Generative Artificial Intelligence: The authors of the current study declare that the article and/or tables and figures were not written/created by AI and AI-assisted technologies.

Authors' Contributions: Concept: NS, SY, BEK, EC, Study design: NS, Data collection or processing: NS, BEK, VO, LT Analysis or interpretation: SY, NS Literature Search: NS, SY, EC, BEK Writing: NS.

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