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POLYTRAUMA IN TWO-MONTH-OLD (*Felis catus domesticus*) UNDERGOING SURGICAL TREATMENT: CASE REPORT

POLITRAUMA EM GATO (*Felis catus domesticus*) DE DOIS MESES DE IDADE SUBMETIDO A TRATAMENTO CIRÚRGICO: RELATO DE CASO

POLITRAUMATISMO EM UM GATO (*Felis catus domesticus*) DE DOS MESES SOMETIDO A TRATAMIENTO QUIRÚRGICO: REPORTE DE CASO

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ABSTRACT

A two-month-old, 0.7 kg male mixed-breed cat was examined and referred for surgery at a veterinary clinic in Rio de Janeiro. The clinical history indicated that the cat had been found abandoned, presenting with difficulty walking, lateral recumbency, and vocalization as a sign of pain. Clinical and imaging examinations diagnosed intestinal eventration in the lateral abdominal region and a Salter-Harris fracture of the left femur. Exploration of the abdominal cavity during surgery revealed intestinal eventration and incomplete rupture of the diaphragm at its costal insertion. Complete exploration of the abdominal cavity in this case of polytrauma allowed for the repair of the affected structures. The animal was discharged 48 hours after surgery without postoperative complications and returned for follow-up two months later in good health. The young age of the animal, the polytrauma, and the need for surgical treatment are noteworthy. Early intervention by a specialized multidisciplinary team was crucial for the recovery of respiratory and cardiovascular parameters and for a better prognosis. However, even with the increased risk associated with the time elapsed since the injury, curative surgical treatment was recommended.

Keywords: Trauma. Young Felines. Diaphragmatic Hernia. Salter-Harris Fracture.

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RESUMO

Um felino macho de raça mista, com dois meses de idade e 0,7 kg, foi examinado e encaminhado para cirurgia em uma clínica veterinária no Rio de Janeiro. O histórico clínico indicava que o felino havia sido encontrado abandonado, apresentando dificuldade de deambular , decúbito lateral e vocalização como sinal de dor. Os exames clínicos e de imagem diagnosticaram eventração de alças intestinais na região abdominal lateral e fratura de Salter-Harris do fêmur esquerdo. Na exploração da cavidade abdominal durante a cirurgia constatou-se eventração intestinal e ruptura incompleta do diafragma em sua inserção costal. A exploração completa da cavidade abdominal neste caso de politraumatismo permitiu o reparo das estruturas afetadas. O animal recebeu alta 48 horas após a cirurgia sem complicações pós-operatórias, e retornou para acompanhamento dois meses depois em bom estado de saúde. Devido a pouca idade do animal com politraumatismo e a necessidade de tratamento cirúrgico são dignos de nota. A intervenção precoce por uma equipe multidisciplinar especializada foi crucial para a recuperação dos parâmetros respiratórios e cardiovasculares e para um melhor prognóstico. Contudo, mesmo com o aumento do risco associado ao tempo decorrido desde a lesão, o tratamento cirúrgico curativo foi recomendado.

Palavras-chave: Traumatismo. Felinos Jovens. Hérnia Diafragmática. Fratura Salter Harris.

RESUMEN

Un gato mestizo macho de dos meses de edad y 0,7 kg fue examinado y derivado para cirugía en una clínica veterinaria en Río de Janeiro. La historia clínica indicó que el gato había sido encontrado abandonado, presentando dificultad para caminar, decúbito lateral y vocalización como signo de dolor. Los exámenes clínicos y de imagen diagnosticaron eventración intestinal en la región abdominal lateral y una fractura de Salter-Harris del fémur izquierdo. La exploración de la cavidad abdominal durante la cirugía reveló eventración intestinal y rotura incompleta del diafragma en su inserción costal. La exploración completa de la cavidad abdominal en este caso de politraumatismo permitió la reparación de las estructuras afectadas. El animal fue dado de alta 48 horas después de la cirugía sin complicaciones postoperatorias y regresó para seguimiento dos meses después en buen estado de salud. Cabe destacar la corta edad del animal, el politraumatismo y la necesidad de tratamiento quirúrgico. La intervención temprana por parte de un equipo multidisciplinario especializado fue crucial para la recuperación de los parámetros respiratorios y cardiovasculares y para un mejor pronóstico. Sin embargo, incluso con el mayor riesgo asociado al tiempo transcurrido desde la lesión, se recomendó un tratamiento quirúrgico curativo.

Palabras-clave: Traumatismo. Felinos Jóvenes. Hernia Diafragmática. Fractura de Salter-Harris.

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1 INTRODUCTION

Trauma is an injury or wound caused by an injurious action to the body. Polytrauma, also known as multiple trauma, is characterized by multiple serious injuries affecting two or more different body regions, resulting from a sudden and violent action by various agents, which leads to a higher incidence of death (Lima et al., 2014; Choperena et al., 2023; O'Byrne & Cole. 2025). Local signs and symptoms in clude pain, tenderness, stiffness, and bruising. Systemic effects can include hypotension, tachycardia, and even hypovolemic shock; abdominal involvement causes significant morbidity and mortality. The main types of physical trauma are those causing blunt, incised, or puncture/penetrating wounds with a loss of skin continuity. They can bemixed (blunt and penetrating). Contusion, on the other hand, is a traumatic injury without loss of skin continuity (Ribas-Filho et al., 2008).

Tissue hypoperfusion resulting from hemorrhage, associated with inadequate oxygen supply and consumption, further impairs the body's response and, along with pain activation, can trigger a systemic inflammatory response (O'Byrne & Cole. 2025).

Polytrauma is a medical emergency that requires prompt and sometimes multidisciplinary treatment.

Laboratory tests assess the impairment of physiological status and signs of trauma severity.

Imaging tests play a fundamental role in diagnosing bone, visceral, vascular, neurological, and soft tissue trauma, among others (Choperena et al., 2023; Gelman et al., 1991). However, their use should be judicious, depending on the patient's hemodynamic status and available resources.

Salter-Harris fractures are injuries occurring in the growth plates, which are cartilaginous areas at the ends of long bones. These fractures are especially common in young animals (Brown & DeLuca, 1992**)**.

Traumatic diaphragmatic rupture is an urgent and sometimes asymptomatic condition. The mechanism of traumatic diaphragmatic rupture involves an abrupt increase in intra-abdominal pressure coinciding with forced exhalation, which ruptures the diaphragmatic muscle (Gelman et al., 1991).

Given the patient's young age, the inherent risks of polytrauma, and the scarcity of information in databases searched using descriptors like 'polytrauma in very young animals' and 'polytrauma in feline kittens,' the objective of this study was to report the case of a feline kitten (*Felis catus domesticus*). The kitten was diagnosed with eventration of intestinal loops

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in the lateral abdominal region, a complete fracture of the distal epiphysis of the left femur, and an incomplete diaphragmatic laceration at its costal attachment, which was observed intraoperatively.

2 CASE REPORT

A two-month-old male mixed-breed kitten (*Felis catus domesticus*), weighing 0.7 g, was attended to at a Veterinary Medical Clinic in Rio de Janeiro, RJ. It was found in a public square in the Jardim Guanabara neighborhood of the Ilha do Governador administrative region, RJ.

The history indicated it was an abandoned animal with difficulty ambulating, lying in a lateral decubitus position, and vocalizing due to pain. A small abscess was also noted in a wound on the lower right mandible.

The clinical examination included inspection of the head, airways, thorax, abdomen, and limbs, along with ophthalmic and neurological assessments. Inspection revealed, in addition to difficulty ambulating, edema on the right abdominal flank with visible peristaltic movements (Figure 1). Palpation revealed intra-abdominal structures beneath the intact skin, with eventration of intestinal loops and part of the spleen. Thoracic auscultation of the lungs and heart revealed no apparent abnormalities. Crepitus was noted in the distal femoral region of the left hind limb. The right hind limb showed no signs of impairment.

Figure 1

Distended abdomen with diagnosed eventration.

Source: Personal Archive, 2026

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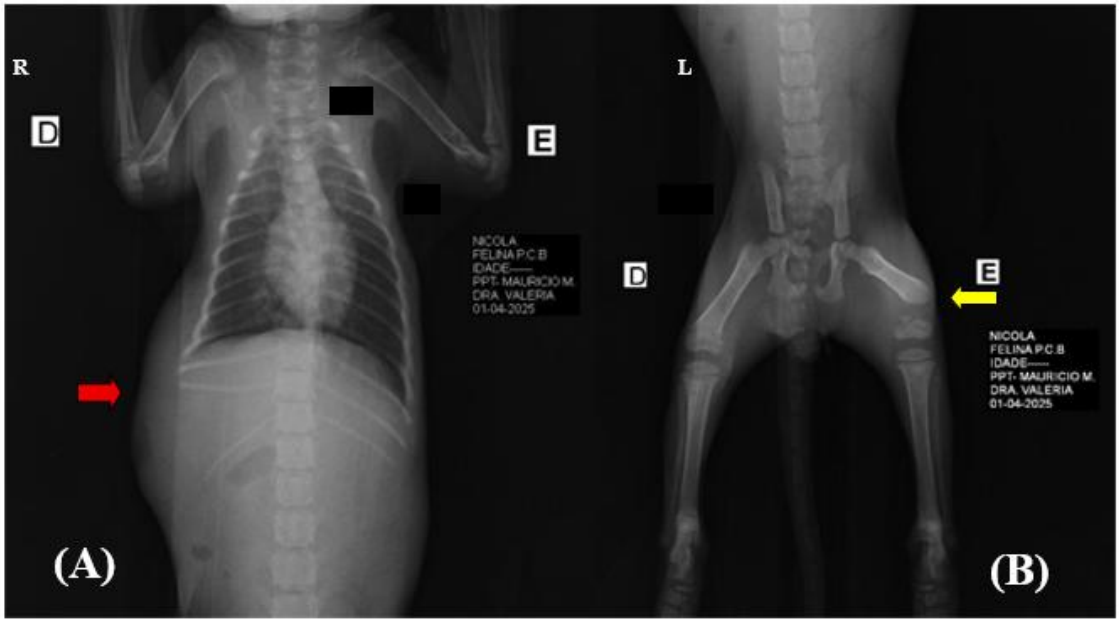
Radiographs of the thoracic, abdominal, and pelvic regions were requested in ventrodorsal and lateral views. The radiographic report indicated no viscera in the thoracic region (Figure 2 A). Edema was present in the lateral abdominal region, extending from the eighth right rib to the right paralumbar area. The left hind limb showed a complete Salter-Harris fracture of the distal femoral epiphysis with displacement of the fragments (Figure 2 B); other bone structures appeared preserved.

Figure 2

Chest and abdominal radiograph (A). Thorax: diaphragmatic dome and crura appear preserved. Loss of definition of abdominal structures (red arrow). Pelvis (B): Salter-Harris fracture (yellow arrow).



Source: Personal Archive, 2026

The animal remained hospitalized for analgesia, drainage, and cleaning of the abscess. A complete blood count (CBC) and serum biochemistry panel (ALT, AST, GGT, Urea, Creatinine) were requested. The results were within normal limits. The animal underwent surgery 48 hours later, after an eight-hour food fast and withholding water for 4 hours preoperatively.

The pre-anesthetic protocol included intramuscular administration of methadone [Mytedom®, IV 0,15 mg/kg], intravenous induction with propofol [Propovan® - 6 mg/kg, IV em bolos] , tracheal intubation, and maintenance with isoflurane [Isoforine®] at 1.5 MAC

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(Minimum Alveolar Concentration) in 100% oxygen via a Baraka circuit, and an intravenous administration of 2 µg/kg fentanyl citrate [Fentanil® - 2,5 mcg/kg, IV]

After positioning the patient in dorsal recumbency on the surgical table and performing antisepsis and asepsis procedures, a right paramedian longitudinal exploratory laparotomy was performed. Intraoperatively, intestinal loops and a portion of the spleen were found beneath the subcutaneous tissue. There was an elliptical tear involving the right external and internal abdominal oblique muscles, part of the transversus abdominis muscle, and the parietal peritoneum (Figure 3 A).

Exploration of the abdominal cavity and other organs continued, revealing an incomplete rupture of the diaphragm at its costal attachment (Figure 3 B). The decision was made to repair the diaphragm using simple interrupted sutures of 3-0 nylon [Nylon®] with a cutting needle. The anesthetist was instructed to inflate the right lung and prevent exhalation during four consecutive maneuvers, corresponding to the placement of the final four sutures in the diaphragmatic muscle. It was observed that the caudal lobe of the right lung made contact with the diaphragm under this applied positive pressure. In the abdomen, the peritoneum, transversus abdominis, internal oblique, and external oblique muscles were closed using a continuous suture pattern with 3-0 polyglactin 910 [Poliglactina®]. An Aberdeen knot was placed every two passes to reinforce the suture line. The subcutaneous tissue was closed using a continuous suture pattern with the same suture material but in size 4-0, with a taper-point needle. The skin was closed with simple interrupted X-sutures using 3-0 nylon [Nylon®] and a cutting needle.

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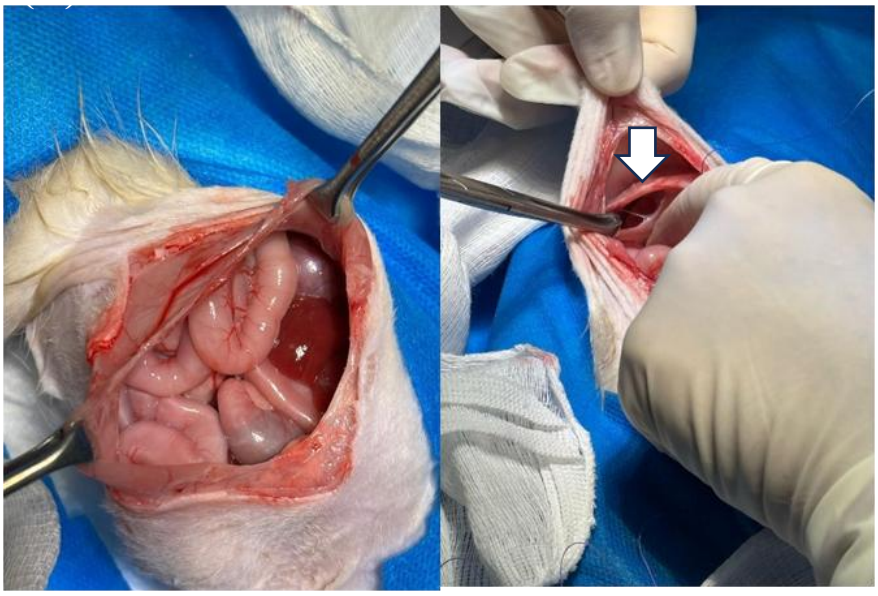
Figure 3

Laparotomy showing eventration (A); The rupture (white arrow) of the diaphragm is observed (B).



Source: Personal Archive, 2026

Following completion of the abdominal surgery, a manual closed reduction of the femoral fracture was performed. The fracture was then immobilized using adhesive tape applied in a fish-scale pattern (Figure 4 A).

In the immediate and early post-operative period, meloxican [Maxican® - 0,2% 0.05 mg/kg] was administered subcutaneously every 24 hours for four days. The abdominal surgical wound dressing was treated with an ointment containing Gentamicin, Sulfanilamide, Sulfadiazine, Urea, and Vitamin A [Vetaglos®]. every 48 hours for ten days. Sutures were removed on the tenth postoperative day, at which time the kitten was discharged. Thirty days postoperatively, radiographs were requested to monitor the progress of bone healing.

An X-ray was taken 58 days after surgery, which revealed a fracture in the consolidation phase with the formation of an exuberant bone callus (Figure 4 B), which had not yet completed the bone remodeling phase. The last information provided by the owner, after the animal was discharged, was that he was fully active, interacting with other animals and leading a normal life with no apparent sequelae.

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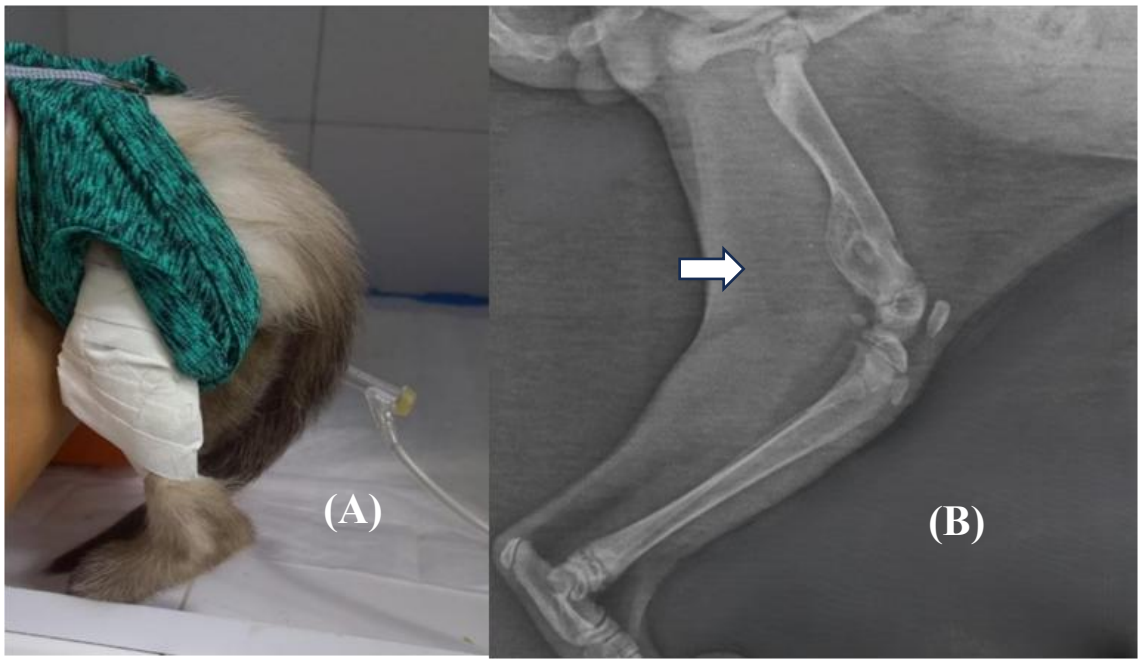
Figure 4

Left femorotibiopatellar immobilization (A). Radiograph of the patient 58 days after surgery (B). Fracture in the consolidation/bone callus formation phase (arrow).



Source: Personal Archive, 2026

3 DISCUSSION

The rescued kitten presented in lateral recumbency, had difficulty moving, and vocalized due to pain. These findings are consistent with descriptions of polytraumatized animals, which often exhibit prostration, intense pain, and a distended abdomen, requiring urgent assessment for internal organ damage and hemorrhage (Crowe & Dacvs. 2006; Lima et al., 2018; Choperena et al., 2023).

The principle that initial care for polytraumatized patients should be consistent, whether *in anima nobili* or in *anima vili,* was acknowledged and applied to the context of small animal veterinary medicine. One of the primary challenges in urgent and emergency care, given the severity and complexity of injuries often encountered, is the application of the ABCDE protocol (Airway, Breathing, Circulation, Neurological Deficit, Exposure). This protocol is widely used to organize care and prioritize essential interventions. This protocol facilitates the orderly and systematic identification and treatment of life-threatening injuries, ensuring each step is carefully followed to prevent complications that could jeopardize survival (Santana et al., 2024**)**.

Radiographs revealed a loss of definition of abdominal structures, potentially related to eventration and soft tissue edema. Thoracic radiographs showed lung fields with normal

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radiolucency, an unaltered pleural space, and preserved diaphragmatic dome and crura. The left femur exhibited a complete fracture of the distal epiphysis with axial deviation. Radiography, as an auxiliary diagnostic tool, confirmed the eventration and left femoral fracture, aligning with the assertion that imaging plays a crucial role in diagnostic confirmation (Gelman et al., 1991; Choperena et al., 2023). Although ultrasonography and magnetic resonance imaging can aid in diagnosing diaphragmatic injuries, they are often not clinically feasible in polytraumatized patients (Bocchini et al., 2012; Zarour et al., 2013; Perin et al., 2022).

During exploratory laparotomy, portions of the intestinal loops and spleen (head and body) were found directly beneath the subcutaneous tissue. Additionally, a partial rupture in the superior aspect of the diaphragm was identified. These findings confirmed polytrauma, characterized by multiple severe injuries in two or more distinct body regions (O'Byrne & Cole, 2025). A diaphragmatic hernia had not formed, as the rupture was located at the diaphragm's costal attachment, and the intestinal loops and part of the spleen likely could not migrate into the diaphragmatic defect; thus, they remained contained within the eventration. It is recognized that this type of hernia can remain clinically silent for an extended period or manifest as an acute complication weeks, months, or even years post-injury (Zarour et al., 2013).

A meticulous abdominal inspection was of fundamental importance to identify injuries that may have occurred in other organs after polytrauma, as in the case of this feline, in which the radiograph did not reveal viscera in the thoracic cavity. A rupture of the diaphragm was observed and, if the diaphragm had not been sutured, complications could have occurred from the moment these viscera migrated to the thoracic cavity, which could have occurred later at another time, which corroborates the statements about greater attention to polytraumatized animals (Zarour et al., 2013; Perin et al., 2022).

The kitten presented with a left femoral fracture classified as a Salter-Harris fracture with distraction. These are injuries that occur in the growth plates of long bonescartilaginous areas at the bone ends. The fracture line traverses the growth plate, completely separating the epiphysis from the diaphysis. Closed reduction was selected as the treatment method due to the animal's young age, aiming to avoid disruption of bone growth. This approach was validated by observing the animal's subsequent activity, which revealed no functional impairment. This aligns with literature stating that Salter-Harris fractures can be treated by either closed or open reduction. Reduction must be performed carefully to avoid damaging

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or abrading the physis with metaphyseal bone fragments (Houlton et al., 2005; Arnold et al., 2017; D'Angelo et al., 2017; Ho-Fung et al., 2017), which supports the treatment chosen for this young patient.

4 CONCLUSION

Polytrauma in young animals is alwet ays considered serious and potentially fatal. Early care by a specialized multidisciplinary team is paramount for restoring respiratory and cardiovascular parameters and improving prognosis. However, even with the increased risk associated with the time elapsed since injury, curative surgical treatment is recommended.

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