

MANAGEMENT OF CHRONIC POST-TRAUMATIC HERNIA IN A CAT USING POLYPROPYLENE MESH: CASE REPORT

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Abstract: A one year old female mixed-breed cat presented for clinical exam with a history of 6 weeks old left hind-limb limping, abdominal hernia, coprostitis and dyspneic breathing following a traumatic event. After the clinical exam was performed, a radiological exam under general anesthesia was recommended and revealed a chronic diaphragmatic hernia, a chronic ventro-lateral abdominal wall hernia, megacolon with fecal impaction, chronic costal fractures and chronic left ilium body fracture. After surgical diaphragmatic and abdominal wall simple herniorrhaphy in which the diaphragmatic hernia was characterized by hepatothorax and enterothorax, a recurrence of the abdominal wall hernia was observed at the two months follow-up, associated with the presence of a prepubic tendon rupture and progressing to a urinary bladder hernia surrounded by severe adhesions. This was subsequently managed by repositioning the urinary bladder and hernioplasty using Polypropylene mesh. After 2 months of follow up the cat was declared healed with no signs of recurrence. This report underscores the challenges associated with chronic post-traumatic hernias and demonstrates the critical role of polypropylene mesh in the effective management of recurrent abdominal wall hernias, ensuring structural stability in cases with significant tissue damage.

• Introduction

Traumatic hernias in small animals represent a significant clinical challenge, often involving complex multi-organ displacement and requiring prompt diagnostic and surgical intervention. In feline patients, high-energy trauma such as road traffic accidents is a common cause of diaphragmatic and abdominal wall hernias, frequently accompanied by orthopedic and soft tissue injuries [Besalti et al., 2011, Fossum, 2019]. Concurrent abdominal wall hernias, especially those involving the ventro-lateral region, are frequently associated with blunt trauma and may initially go unnoticed due to the presence of more life-threatening conditions [Shaw et al., 2003, Gibson et al., 2005]. Chronicity further complicates these cases, as prolonged herniation often leads to tissue fibrosis, adhesions, and loss of abdominal domain, making primary closure more difficult [Pavletic, 2018]. The use of prosthetic materials, particularly polypropylene mesh, has become an established technique in the repair of complex and recurrent hernias in veterinary surgery. Polypropylene mesh provides durable reinforcement, promotes fibrovascular integration, and allows for tension-free closure in cases where native tissue is inadequate [Salgaonkar and Lomanto, 2017].

• Material and method

A one year old female mixed-breed cat with a history of 6 weeks of left hind-limb limping, abdominal hernia, coprostitis and dyspneic breathing following a traumatic event was presented for clinical examination. Clinical examination revealed a 38,2° Celcius intra-rectal temperature, tachypnea with abdominal breathing, distended abdomen with ventro-lateral non-reducible tumefaction. Orthopedic examination revealed increased sensitivity and pain on palpation in the left pelvic area and at left coxal-femoral extension. A radiographic examination was performed under general anesthesia and revealed a diaphragmatic hernia, megacolon with fecal impaction, discontinuity in the ventral abdominal wall and herniated small intestine, chronic costal fractures and a simple left body ilium fracture (Figure 1.).



Figure 1. Radiographic examination as a diagnosis tool for hernias: Lateral view – diaphragmatic hernia, ventral abdominal wall hernia, megacolon;

The first surgical intervention addressed the diaphragmatic hernia and the ventral abdominal hernia. Both hernias were repaired by simple herniorrhaphy. Two months postoperatively, the patient was presented with ventro-lateral tumefaction and ultrasonography was performed in order to determine the herniated organ, which was the bladder. The animal underwent synthetic underlay mesh reconstruction using sterile 15x15 cm polypropylene mesh (Trulene mesh, Healthium). The internal organs were protected for future visceral adhesions by a layer of omentum interpositioned between them and the polypropylene mesh. The mesh implantation was done using underlay technique having the lowest rate of reherniation and wound complications [Albino, et al., 2013, Timmermans, et al., 2014] (figure 2. b.). The mesh placement required preplaced horizontal mattress sutures using absorbable 2/0 PDO all around the defect including the pubis bone through pre-drilled holes using a 1.5 mm drill bit, after the technique described by [Beittenmiller in 2009] (figure 2. a.).

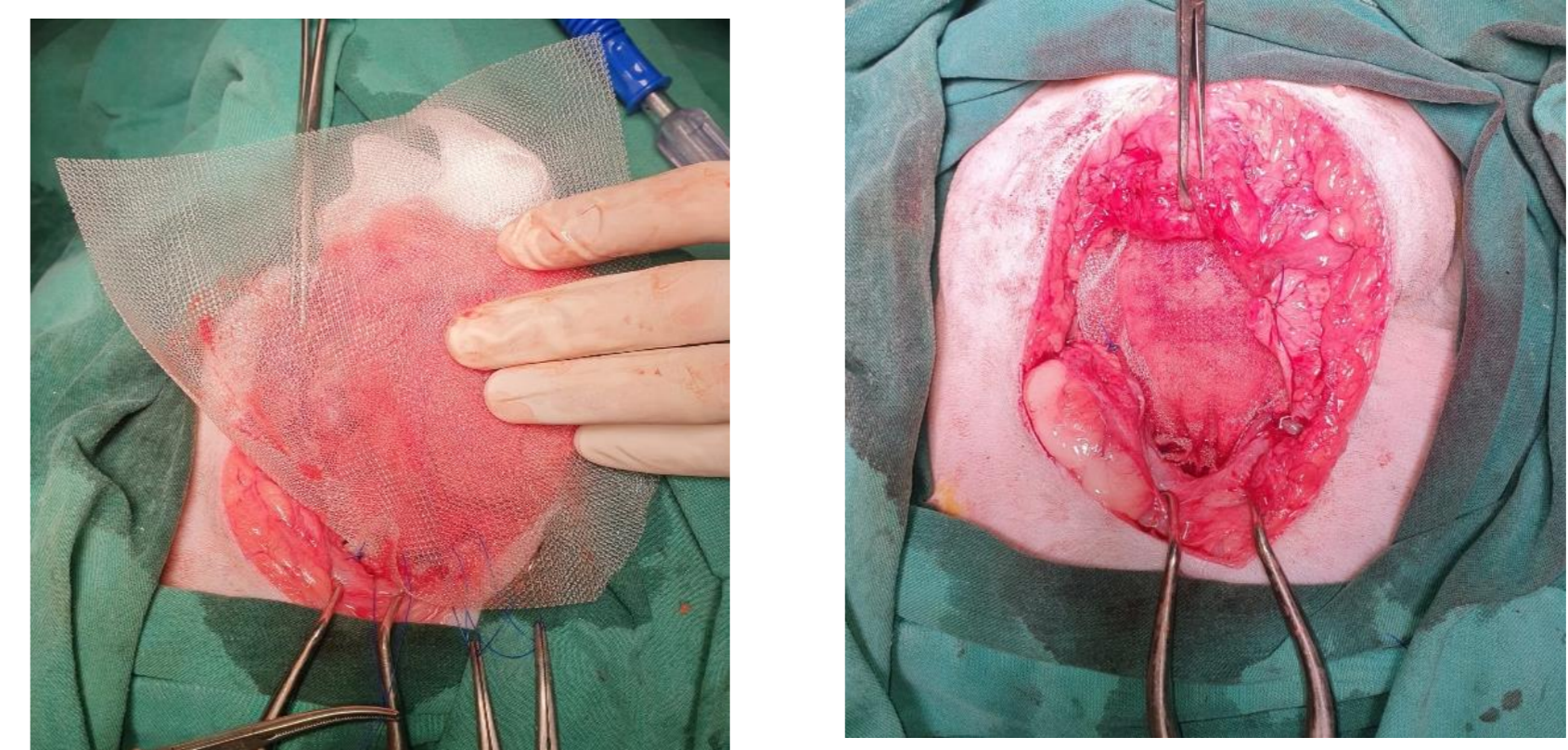


Figure 2. (a) Start of preplaced horizontal mattress suture placement through pre-drilled holes in the pubis bone for underlay technique and omentum layer placed under the mesh; (b) Polypropylene mesh hernioplasty

• Results and discussions

The clinical and surgical management of the patient resulted in a favorable overall outcome, with progressive resolution of the major presenting conditions. Following abdominal wall hernia recurrence, the polypropylene mesh hernioplasty proved successful in providing structural integrity in the ventral abdomen (figure 3.).

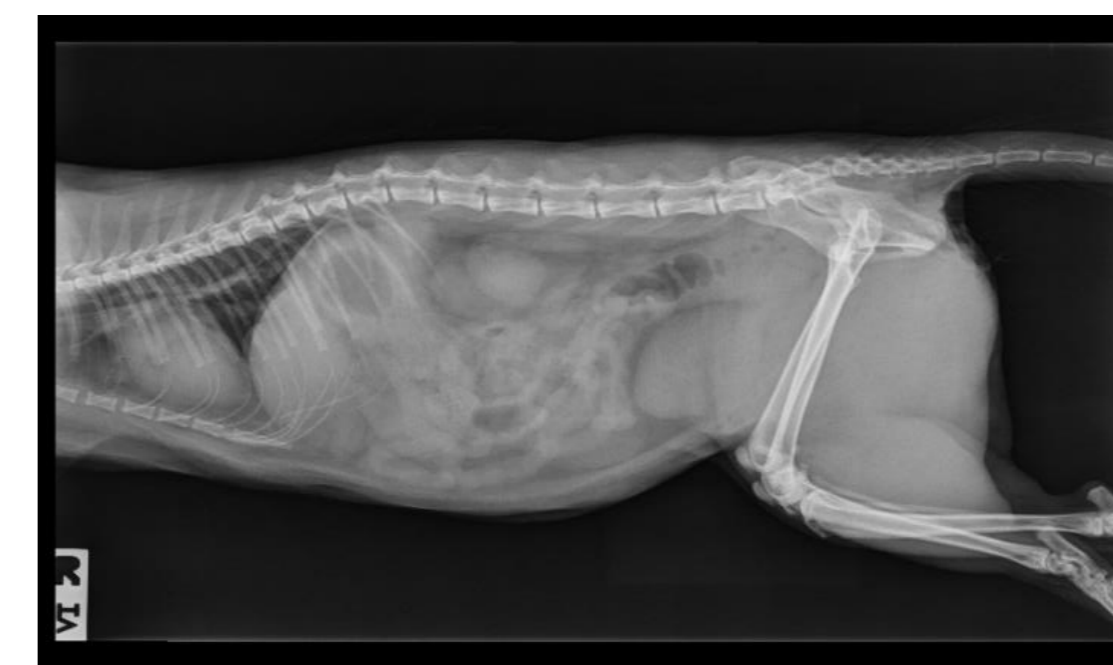


Figure 3. Radiographic examination illustrating the integrity of the ventral abdominal wall 2 months post polypropylene mesh hernioplasty – lateral view.

Gastrointestinal transit also improved following fecal evacuation and continued medical management of megacolon, with gradual resolution of coprostitis. The choice of mesh placement technique and mesh material play a critical role in the success of abdominal wall reconstruction. Polypropylene mesh is the most commonly used material for abdominal wall reconstruction due to its strength and biocompatibility. Its porous structure allows fibrovascular ingrowth, ensuring good integration and long-term stability, while studies show it can restore abdominal wall mechanics close to normal. [Butler et al., 2013, Engelsman et al., 2007]. The underlay (sublay) technique is generally considered superior due to its lower rates of reherniation and wound complications, as well as its ability to distribute tension efficiently and maximize mesh-fascia contact [Albino 2013, Timmermans et al., 2014]. In contrast, alternative methods such as onlay and interposition techniques present notable disadvantages [Larson & Vandertoll, 1984, Tobias and Johnston, 2018]. Although non-absorbable sutures such as polypropylene are generally preferred in hernia repair due to their long-term tensile strength and prolonged tissue support, the use of absorbable materials can still be justified in certain clinical situations. Absorbable sutures like polydioxanone are capable of maintaining sufficient tensile strength for several weeks, which may be adequate to support initial healing and tissue integration of the polypropylene mesh [Beittenmiller, et al., 2009, Friend and White, 2002].

• Conclusions

Early stabilization followed by prompt surgical intervention is essential in complex traumatic cases, leading to improved respiratory function and overall prognosis. The underlay technique using polypropylene mesh provides a reliable method for abdominal wall reconstruction, combining superior mechanical stability and lower complication rates with excellent tissue integration and long-term strength.