

**SURGICAL TREATMENT OF UMBILICAL HERNIA IN A LOCAL CAT****Penanganan Bedah Hernia Umbilikalisis pada Kucing Lokal****Nethania Liady<sup>1\*</sup>, I Gusti Agung Gde Putra Pemayun<sup>2</sup>, Anak Agung Gde Jayawardhita<sup>2</sup>**<sup>1</sup>Veterinary Medicine Student, Faculty of Veterinary Medicine, Udayana University, Denpasar, Bali, Indonesia<sup>2</sup>Department of Veterinary Surgery, Faculty of Veterinary Medicine, Udayana University, Denpasar, Bali, Indonesia\*Corresponding author email: [nethanialiady@gmail.com](mailto:nethanialiady@gmail.com)

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**Abstract**

Umbilical hernia is an anatomical abnormality in which the muscles around the umbilicus fail to close properly, causing part of the intestine or omentum to enter the hernia sac through the abdominal cavity. The purpose of this article is to present a case study of congenital umbilical hernia in cats, including methods of diagnosis, management, and treatment. A 3-month-old male local cat weighing 1.5 kg came with a lump in the abdominal area, accompanied by a ring and mass that could be pushed back in. According to the owner, the lump had been there since the cat was born and continued to grow over time. Based on the results of physical, clinical, and supporting examinations in the form of barium contrast X-rays, the cat was diagnosed with an umbilical hernia which is a congenital disease with a Fausta prognosis. Treatment is carried out by surgically repositioning the contents of the hernia in the form of intestines into the abdominal cavity and suturing. Postoperatively, the antibiotic cefotaxime injection was given, followed by oral antibiotics, nonsteroidal anti-inflammatory drug, and topical antibiotic cream. On the 8th day after surgery, the case cat was declared cured with a dry and fused surgical wound, normal appetite, normal defecation and urination. It can be concluded that the surgical procedure and subsequent treatment successfully cured the hernia. Cats with umbilical hernias should be treated as soon as possible to prevent the hernia opening from getting bigger and causing conditions that endanger the cat's health.

Keyword: Umbilical hernia, reposition, local cat.

**Abstrak**

Hernia umbilikalisis merupakan kelainan anatomi dimana otot sekitar pusar tidak dapat menutup dengan baik sehingga menyebabkan sebagian usus atau omentum masuk ke dalam kantung hernia melalui rongga perut. Tujuan dari artikel ini adalah untuk menyajikan studi kasus hernia umbilikalisis kongenital pada kucing, meliputi metode diagnosis, penatalaksanaan, dan pengobatan. Seekor kucing lokal jantan berusia 3 bulan dengan berat 1,5 kg datang dengan keluhan benjolan pada daerah perut disertai rasa nyeri dan benjolan yang dapat didorong masuk kembali. Menurut pemiliknya, benjolan tersebut sudah ada sejak kucing tersebut lahir dan terus

membesar seiring berjalannya waktu. Berdasarkan hasil pemeriksaan fisik, klinis, dan penunjang berupa foto rontgen kontras barium, kucing tersebut didiagnosis menderita hernia umbilikalis yang merupakan penyakit bawaan dengan prognosis Fausta. Penanganannya dilakukan dengan pembedahan untuk memasukkan kembali isi hernia berupa usus ke dalam rongga perut dan dilakukan penjahitan. Pascaoperasi diberikan suntikan antibiotik cefotaxime, dilanjutkan dengan pemberian antibiotik oral, obat antiinflamasi nonsteroid, dan krim antibiotik topikal. Pada hari ke-8 pascaoperasi, kucing kasus dinyatakan sembuh dengan luka operasi kering dan menyatu, nafsu makan normal, buang air besar dan buang air kecil normal. Dapat disimpulkan bahwa tindakan pembedahan dan penanganan selanjutnya berhasil menyembuhkan hernia. Kucing yang mengalami hernia umbilikalis sebaiknya segera ditangani untuk mencegah lubang hernia membesar dan menimbulkan kondisi yang membahayakan kesehatan kucing.

Kata kunci: Hernia umbilikalis, reposisi, kucing lokal.

## INTRODUCTION

Cats are one of the mammals that have been kept by humans for thousands of years. Cat care includes many things including paying attention to the health and well-being of the cat. Cats can be attacked by various diseases, both infectious and non-infectious. Diseases that are infectious can be caused by bacteria, viruses, and fungi, while one of the non-infectious diseases in cats is hernia (Putra et al., 2022).

Hernias can occur congenitally (genetically) which is a condition that occurs while the animal was still in the womb or was just born, such as umbilical hernias. Normally, after the cat is born, the placenta will be cut off and the connection in the umbilical area will close. Umbilical hernias occur when the hole does not close properly. Amare and Haben (2020) stated that abdominal hernias that often occur in all species include umbilical hernias with a figure of 44.8% of all hernias, then diaphragmatic hernias of 31% due to trauma, scrotal hernias of 13.8% and inguinal hernias of 10.4%. Hernias can be classified into reducible if the clinical picture of the hernia can be reduced to its original place spontaneously, and irreducible if the contents of the hernia cannot be returned spontaneously. Irreversible hernias can occur due to; adhesions, if scar tissue that unites two surfaces was formed; incarcerated, if the clinical picture of the hernia has caused intestinal passage disorders; and strangulated, if the clinical picture of the hernia has caused vascularization disorders where the lump feels painful and hyperaemic (Akhter et al., 2015). Umbilical hernia is actually a harmless condition, but in some cases when tissue enters the hernia site, organs such as the intestines can be pinched so that they will block the intestines and will cut off blood vessels, causing death of intestinal cells and tissue (Sukma et al., 2019).

The diagnostic approach to umbilical hernia begins with a complete history, clinical examination, and supporting examinations. Diagnosis is made using x-rays. The common action taken in patients with umbilical hernia is laparotomy to return the organs to their original position and close the hernia ring (Aulia et al., 2022). The purpose of this article is to present a case study of congenital umbilical hernia in cats, including methods of diagnosis, management, and treatment.

## RESEARCH METHODS

### Signalement and anamnesis

The patient is a male local cat named Simba weighs 1.8 kg with brown hair and is 3 months old. The cat comes from Br. Wangaya Kelod, Dauh Puri Kaja, North Denpasar District with a complaint of a lump in the abdomen area that the owner has noticed since the cat was born which has gotten bigger over time. Every day the cat is released inside the house and fed with

dry cat food, the cat has not been vaccinated and has not been given deworming medicine. The results of the examination of the lump when palpated felt the consistency of the mass inside the lump was soft and there was a ring around it, but the outer lump felt quite tight, the cat did not show any symptoms of illness, had a good appetite and drinking, and urination and defecation were normal.

### **Physical Examination and Clinical Signs**

A thorough physical examination and evaluation of clinical signs are essential steps in preparing a cat for surgery. They help identify any pre-existing conditions that might affect anesthesia or the surgery's outcome. Proper pre-surgical assessments improve the chances of a successful procedure, and if any concerns arise, the vet may delay surgery or adjust the treatment plan accordingly. Many surgical and anaesthetic complications are a result of pre-existing clinical conditions, most of which are associated with abnormalities that could have been identified by a skilled examiner and thorough exam. A good physical exam can point to many conditions and cause a change in anaesthetic or surgical technique, monitoring, and support.

In the physical examination of the oral mucosa and eye conjunctiva, normal results were obtained, as well as in the examination of the limbs, skin, feces, urine, respiratory system, circulatory system, nervous system, and reproductive system, there were no signs of abnormalities. The results of the cat's physical examination was a lump found in the abdominal area, when palpated a mass with a soft consistency was felt (figure 1). If the mass was pushed, it would enter the abdominal cavity and a hole or ring was felt.

### **Supporting Examination**

Before performing hernia surgery on a cat, several supporting examinations are essential to assess the cat's overall health and ensure it is fit for anaesthesia and the surgical procedure. These tests provide crucial information about the cat's systemic health, particularly the organs and systems that may be affected by anaesthesia or the surgical procedure. Supporting examinations that was done for this case was haematological examination and x-ray. X-ray examination with and without barium contrast were carried out with the following results:

## **RESULTS AND DISCUSSION**

### **Evaluation Results**

Postoperative observation on the first day, the case cat has started to be active due to the nature of ketamine which has fast induction and recovery time (Sukma et al., 2019). The condition of appetite and drinking, as well as efficacy and urination were observed to be normal. On day 0 to day 3, redness and inflammation were observed in the wound. This reaction occurs due to mediation by cytokines, chemokines, growth factors, and effects on receptors. On day 6, the inflammation and redness had subsided and the wound had begun to dry out so that the stitches could be partially opened. The wound began to dry out due to the formation of tissue granulation that occurs in the proliferation phase, namely fibroblasts assisted by macrophage cells stimulated to form new blood vessels or form new tissue (Septhayuda et al., 2021). On the 8th day after surgery, the sutures had been completely removed and the wound had dried out, the stitches had begun to unite and oral antibiotics were stopped. Detailed evaluation along with images of the operation results can be seen in table 1.

### **Diagnosis and Prognosis**

Based on anamnesis and physical examination, it can be concluded that the diagnosis of the cat case is umbilical hernia with a Fausta prognosis.

## Pre-Operation

Before the operation is performed, the cat was fasted for approximately 12 hours. Then the operating room, tools, materials, and drugs were prepared. The operating room was cleaned and the equipment in the room must be sterilized, the floor and operating table were cleaned and disinfected. The tools and materials to be used were sterilized by autoclave. Then the drugs prepared are premedication, namely atropine sulphate, anaesthetic drugs in the form of a combination of xylazine with ketamine, and infusion fluids (0.9% NaCl). The hernia area that will be operated on was cleaned and shaved so no dirt will interfere the operation process. Furthermore, the cat is injected with atropine sulphate at a dose of 0.02 mg/kg BW subcutaneously and then an IV catheter is installed to insert infusion fluids. After 10 minutes of administering atropine sulphate, the cat is injected with a combination of xylazine and ketamine at doses of 1 mg/kg BW and 11 mg/kg BW intravenously.

## Operation

The animal is positioned in dorsal recumbency, the part to be incised is cleaned using chlorhexidine, alcohol and iodine so that there is no contamination of microorganisms during surgery, then the drape is positioned in the area to be operated on. To determine the position of the hernia ring as a reference for making an incision, the hernia is pressed with a finger and the surrounding area is felt. The incision is made on the skin and subcutaneously just above the hernia ring. In this case, the hernia is in the form of small intestine and does not experience adhesions, the intestine that comes out through the hernia ring is easily reinserted into the abdominal cavity. After that, the edge of the hernia ring is incised to create a new wound for postoperative vascularization, then the hernia ring is sutured with Polyglycolid acid (PGA) thread 3.0 with a simple interrupted pattern and make sure there are no gaps that could make the hernia reoccur. The subcutaneous part is sutured with a simple continuous pattern using PGA thread 3.0. Then the skin part is sutured with a simple interrupted pattern using silk thread 3.0.

## Post-operation

The suture area was given iodine and 0.1% gentamicin sulphate ointment then covered with sterile gauze and taped with hypafix. The cat was given cefotaxime sodium (20 mg/kgBW, IM, q12h) for 3 days and then the treatment was continued with cefixime (10 mg/kgBW, PO, q12h) for 4 days. In addition, an anti-inflammatory drug was also given, namely meloxicam (0.1mg/kgBW IM q24h). Cefotaxime is a third-generation bactericidal antibiotic of the  $\beta$ -lactam cephalosporin group.  $\beta$ -lactam antibiotics work by disrupting bacterial cell wall synthesis and have a broader spectrum of activity against Gram-positive and Gram-negative organisms (Sumano *et al.*, 2004). Meloxicam is a COX enzyme inhibitor and is one of several NSAIDs licensed for use in cats in various countries (Lascelles *et al.*, 2007). Meloxicam has been shown to be an effective analgesic in cats when used perioperatively and has high palatability (Murison *et al.*, 2010).

## Discussion

Based on the history and physical examination, the cat was diagnosed with an umbilical hernia. A hernia is an abnormal protrusion of an organ from its normal location through a hole into a sac lined by three layers: the peritoneum, the tunica flava, and the skin (Riwu *et al.*, 2024). A hernia generally appears as a soft swelling under the skin and often protrudes when the cat stands, meows, cries, or strains. There are several types of hernias, one of which is an umbilical hernia. This umbilical hernia is generally congenital or an abnormal condition that occurs in cats from birth. Before birth, the umbilical blood vessels pass through the umbilical ring (a hole in the abdominal muscles) to provide nutrition for the developing foetus. Umbilical hernia

is caused by incomplete closure of the umbilical ring after birth. Supporting examinations such as x-ray and haematological examination are needed to confirm the diagnosis in some cases of hernia.

Blood test results show low platelets and platelet crit which is also called thrombocytopenia (Table 2). The cat also experienced a slight but insignificant increase in red distribution width (RDW). Thrombocytopenia is one of the most common bleeding disorders in animals. Platelets form the initial hemostatic plug whenever bleeding occurs. If the platelet count is low, the coagulation process will be disrupted, resulting in bleeding. Therefore, it is important to know the platelet count as a prognostic factor in patients treated in intensive care to prevent more fatal consequences resulting from thrombocytopenia (Rismawaty et al., 2013). In this case, examination of clinical signs in cats showed normal results in all aspects so that no special therapy was needed. The physical examinations performed included inspection, palpation, and auscultation. The cat's presents status was obtained as listed in Table 3.

The treatment performed was laparotomy surgery and repositioning the hernia contents into the abdominal cavity. As preparation before surgery, premedication was given in the form of atropine sulphate injected subcutaneously. Premedication is a drug given before induction of anaesthesia with the aim of facilitating induction, duration, and recovery from anaesthesia. Atropine is a preanesthetic agent, classified as an anticholinergic or parasympatholytic (Sephayuda et al., 2021). At regular doses, atropine sulphate can prevent bradycardia and hypersalivation and reduce digestive system motility. The effect of the drug will be seen 10-15 minutes after subcutaneous injection (Rahmawati et al., 2023). For anaesthesia, a combination of xylazine and ketamine is used which is given intravenously. Xylazine causes central nervous system depression so that the animal eventually becomes unconscious or anesthetized. Xylazine can cause mild sleep to deep narcosis, depending on the dose given for each animal species (Gunanti et al., 2013). However, the analgesic effect of xylazine is relatively weak, so it is combined with ketamine which has a strong analgesic effect. Ketamine has strong pain relieving properties and its anaesthetic reaction does not cause drowsiness but the resulting muscle relaxation is not good. To reduce the side effects of ketamine, its use needs to be combined with premedication drugs that have a strong relaxing effect such as diazepam, midazolam, medetomidine, or xylazine.

After the operation is completed, the peritoneum, linea alba, and subcutaneous sections are closed using PGA 3.0 thread. PGA thread is known as a thread that does not interfere with wound healing, and the material is well tolerated in surgery (Dardik et al., 1971). This closure uses simple interrupted sutures with the advantages of being easy, large suture strength, less likely to entrap the circulatory system thus reducing oedema, easy to adjust the edges of the wound, and if there is a thread that breaks the wound will not open completely. Then for subcutaneous closure using a simple continuous suture pattern which has the advantage of fairly fast suture insertion (Sudisma, 2017). Then on the skin using silk thread 3.0, silk thread is chosen because it is made from natural protein filament spun by silkworms and is able to hold tissue permanently, the dressing is guaranteed and will not change in a few days, the tissue reaction caused is lighter, the knot is not easily loose, and the thread can be cut right at the knot so that less thread is left on the tissue (Sudisma, 2017). This skin section is closed with a simple interrupted suture pattern.

## CONCLUSION AND SUGGESTION

### Conclusion

Based on anamnesis, physical examination and clinical signs, and X-ray examination, a cat named Simba was diagnosed with umbilical hernia with a fausta prognosis. Treatment was



carried out by laparotomy to reposition the hernia contents back into the abdominal cavity. Postoperative management was carried out by administering the antibiotic cefotaxime and the anti-inflammatory meloxicam by injection for 3 days, followed by oral cefixime for 4 days. On the 8th day after surgery, the case cat was declared cured with a dry and fused surgical wound.

### Suggestion

Cats with umbilical hernias should be treated as soon as possible to prevent the hole from getting bigger and causing conditions that endanger the cat's health.

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### Figures



Figure 1. Lump on the abdomen of a cat (red arrow)

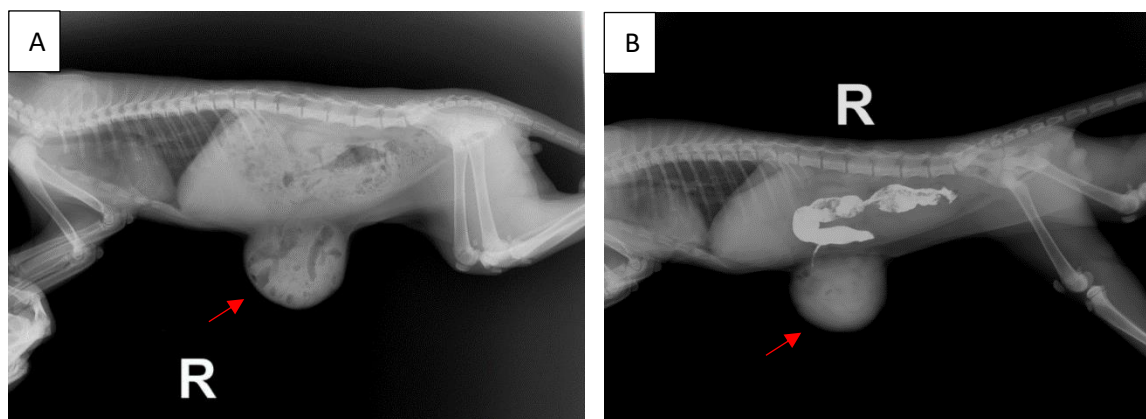


Figure 2. X-ray results with lateral left recumbency position. A) X-ray without barium contrast, B) X-ray with barium contrast. The hernia sac is visible in the umbilical area (red arrow).

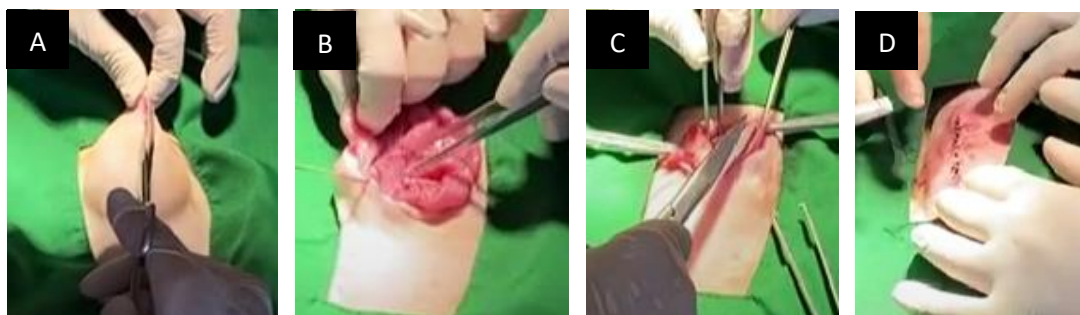


Figure 3. A) Incision in the midline ventral abdomen right above the hernia location, B) The hernia contents are visible in the subcutaneous area, C) Repositioning the hernia contents into the abdominal cavity & Incision to create a new wound on the hernia ring, D) Skin suturing using a simple interrupted pattern.

## Tables

Table 1. Evaluation results

Post-operative observation	Observation result	Treatment
Day 0	The cat had just finished surgery, still looked weak, and the incision area was still wet.	Cefotaxime sodium (dose 20 mg/kg BW, IM, q12h), the wound is given 0.1% gentamicin sulfate ointment, covered with sterile gauze and secured with hypafix.
Day 3	The incision area begins to dry, there is redness and inflammation. Appetite and drinking are good, defecation and urination are normal, and the cat is starting to be active.	Cefotaxime sodium (dose 20 mg/kg BW, IM, q12h), the wound was given 0.1% gentamicin sulfate ointment, covered with sterile gauze and taped with sofra tulle.
Day 6	The incision area has dried and closed, the stitches have been partially removed. Appetite, drinking, defecation and urination are normal.	Cefixime (dose 10 mg/kg BW, IM, q12h), the wound was given 0.1% gentamicin sulfate ointment, covered with sterile gauze and secured with sofra tulle.
Day 8	The sutures have been completely removed. Appetite and drinking are good, defecation and urination are normal, and the cat is active.	The wound was treated with 0.1% gentamicin sulfate ointment.

Table 3. Results of the cat's presents status examination

Type of examination	Result	Normal range	Category
Temperature	37,1°C	37,5-38,6°C	Normal
Heart rate	124 times/minute	65-90 times/minute	Normal
Pulses	84 times/minute	65-90 times/minute	Normal
Respiration	28 times/minute	15-30 times/minute	Normal
Capillary Refill Time (CRT)	<2 seconds	<2 seconds	Normal



Table 2. Results of hematology examination of the case animal.

Item	Result	Reference range	Category
WBC	12.3 x 10 <sup>3</sup> µL	5.5-19.5	Normal
Lymfosit #	5.4 x 10 <sup>3</sup> µL	0.8-7	Normal
Monosit #	0.8 x 10 <sup>3</sup> µL	0-1.9	Normal
Granulosit #	6.1 x 10 <sup>3</sup> µL	2.1-15	Normal
Lymfosit %	43.9 %	12-45	Normal
Monosit %	6.4 %	2-9	Normal
Granulosit %	49.7 %	35-85	Normal
Red Blood Cell	7.79 x 10 <sup>6</sup> µL	6-10	Normal
Haemoglobin	11.5 g/dL	9.5-15.3	Normal
HCT	34.7 %	29-45	Normal
MCV	44.6 fL	39-55	Normal
MCH	14.7 Pg	13-21	Normal
MCHC	33.1 g/dL	30-36	Normal
RDW	17.4 %	13-17	Increase
Platelet	51 x 10 <sup>3</sup> µL	150-600	Decrease
MPV	8.6 fL	5-11.8	Normal
PDW	15.7 fL	10-18	Normal
PCT	0.043 %	0.100-0.500	Decrease
Eos%	5.3 %		Normal

Notes: WBC (White Blood Cell); RBC (Red Blood Cell); HGB (Haemoglobin); HCT (Haematocrit); MCV (Mean Corpuscular Volume); MCH (Mean Corpuscular Haemoglobin); MCHC (Mean Corpuscular Haemoglobin Concentration); PLT (Platelet/Thrombosis); MPV (Mean Platelet Volume); PCT (Procalcitonin).