

Pain management approach in a cat with feline arterial thromboembolism assessed using the Feline Grimace Scale[†]

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ABSTRACT: Feline arterial thromboembolism (FATE) is a life-threatening condition characterized by partial or complete arterial obstruction due to thrombus formation, most commonly secondary to hypertrophic cardiomyopathy (HCM). The resulting ischemia causes severe pain, which is often overlooked in clinical practice. The Feline Grimace Scale (FGS) provides a rapid and objective tool for pain assessment in cats. This report describes an adult female cat presenting with left hindlimb paresis, cyanosis, and femoral pulse deficit, with an initial FGS score of 6/10. Blood chemistry showed elevated creatine kinase (CK) levels, and echocardiography confirmed reduced femoral arterial flow and myocardial hypertrophy, consistent with HCM. A multimodal management approach was applied, including gabapentin, tramadol, clopidogrel, furosemide, and heparin therapy. Despite treatment, the affected limb developed gangrene, necessitating amputation. Preoperative analgesia consisted of pethidine, ketamine, and xylazine, followed by regional lidocaine nerve blocks and postoperative fentanyl continuous rate infusion. The surgical site healed completely within 21 days, and over a four-month follow-up period, the FGS score improved from 9 to 0, indicating complete pain resolution.

Keywords:

feline arterial thromboembolism, hypertrophic cardiomyopathy, multimodal analgesia, Feline Grimace Scale, amputation

■ INTRODUCTION

Feline Arterial Thromboembolism (FATE) is a vascular disorder in which thrombi obstruct arterial blood flow in cats. This condition causes acute ischemia of the hind limbs, leading to tissue hypoxia and pain. Affected cats show signs once the blood supply becomes critically compromised, including sudden vocalization, anorexia, and hind limb paresis or paralysis (Chintari 2022). Owing to its acute onset and overlapping symptoms with other disorders, FATE poses diagnostic challenges in practice.

Recent studies have advanced the understanding of FATE management through combination therapies (Ray *et al.* 2025), yet pain management remains under-recognized. Severe pain from arterial occlusion affects animal welfare and cardiovascular stability. Although validated pain assessment tools exist, their application in thromboembolic conditions is limited. The Feline Grimace Scale has emerged as a reliable tool for assessing acute pain (Robinson *et al.* 2024); however, its use in FATE lacks systematic documentation.

This report describes pain management in a cat with FATE using the Feline Grimace Scale. It documents pain scores, treatments, and outcomes, advancing the understanding of analgesic approaches for feline thromboembolic disease.

■ CASE

Anamnesis and Signalment: A spayed female indoor cat presented to the DNA Animal Clinic with sudden hind limb lameness. The owner reported prior arthritis and herniated

nucleus pulposus (HNP) diagnosis based on radiographs with previous tramadol and joint supplement treatment. The cat had normal appetite, urination, and defecation.

Physical Examination: heart rate 76 beats/min, respiratory rate 44 breaths/min, and temperature 38.3 °C. The cat had delayed skin turgor (> 2 s) and pale mucous membranes. Neurological assessment revealed absent sensory and motor responses in hind limbs, with cyanosis of left paw and pink right paw (Figure 1A). Femoral arterial pulse was weak, with mean arterial pressure (MAP) below 60 mmHg, indicating hypotension. **Differential Diagnoses:** Feline Arterial Thromboembolism (FATE), neurological Feline Infectious Peritonitis (FIP), and HNP.

Hematology: erythrocytosis (12.42 M/ μ L), increased red blood cell distribution width (31.2%), neutrophilia (13.61 K/ μ L), eosinopenia (0.01 K/ μ L), and thrombocytopenia (150 K/ μ L). Biochemistry revealed hyperproteinemia (9.3 g/dL), hyperglobulinemia (6.3 g/dL), hypocalcemia (7.2 mg/dL), hyperphosphatemia (> 22 mg/dL), hyperglycemia, and elevated ALT (358 U/L) and CK (> 3000 U/L). **Echocardiography:** a left femoral artery thrombus, left atrial enlargement, and mitral insufficiency (Figure 1B & 1C). A follow-up scan revealed hypertrophic cardiomyopathy with left atrial dilation and thickened interventricular septum, indicating a risk of thromboembolism.

Received: 28-04-2025 | Revised: 30-05-2025 | Accepted: 08-06-2025

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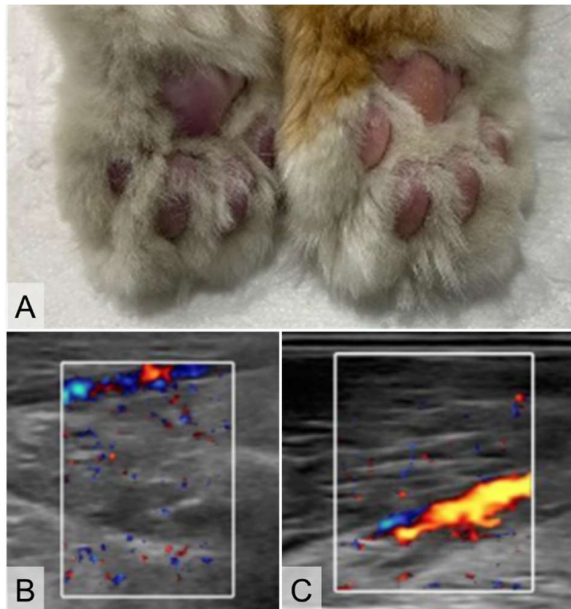


Figure 1. Figure 1. Clinical and sonographic features of feline arterial thromboembolism (FATE). (A) Left hind paw showing cyanosis (left) compared with the pink, well-perfused right paw (right), (B) right femoral artery with normal blood flow, and (C) left femoral artery with reduced flow due to thrombotic obstruction.

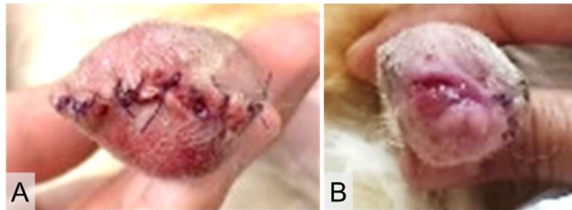


Figure 2. Postoperative healing of the left hind limb after amputation. (A) One day post-surgery showing the initial wound condition and (B) Twenty-four days post-surgery showing complete wound closure.

Initial Treatment: Gabapentin (10 mg/kg), tramadol (2 mg/kg), clopidogrel (loading 75 mg, maintenance 18.75 mg), furosemide (4 mg/kg), and heparin (100 IU/kg). Ischemic necrosis progressed to gangrene, requiring left hind limb amputation (Figure 2). **Preoperative Analgesia:** Pethidine (5 mg/kg), ketamine (10 mg/kg), xylazine (2 mg/kg), with propofol and isoflurane anesthesia. Lidocaine (2 mg/kg) was administered to the sciatic and femoral nerves. **Postoperative Analgesia:** fentanyl (3 µg/kg/h; CRI).

Pain intensity was monitored using the Feline Grimace Scale (FGS) at key time points to guide analgesic therapy. Changes in FGS scores guided therapeutic adjustments and assessed pain management effectiveness (Table S1). The FGS scores decreased after analgesic management, indicating effective control. The surgical site healed with complete wound closure by day 24.

■ RESULTS AND DISCUSSION

Arterial thrombosis is an arterial blockage caused by a thrombus, which is an aggregate of platelets, fibrin, and blood elements that adheres to the vascular endothelium. Virchow's triad of mechanisms includes endothelial injury, hypercoagulability, and altered blood flow (Zachary 2017). Cats are

predisposed to arterial thrombosis due to myocardial disorders, particularly hypertrophic cardiomyopathy (HCM) (Luis Fuentes 2012). Necropsy findings show 21% of cats with HCM have arterial thrombi (Smith & Tobias 2004).

Pain management is vital in veterinary medicine. Pain involves sensory and emotional components (Monteiro *et al.* 2023). Recognizing pain in cats is challenging because of variable behaviors that affect welfare. Validated tools for feline pain recognition include the Glasgow Feline CMPS, UNESP-Botucatu MCPS, CSU-FAPS, and Feline Grimace Scale (FGS) (Nicholls *et al.* 2022). The FGS assesses acute pain through five facial units: ear position, orbital tightening, muzzle tension, whisker position, and head position, scored 0-2, with scores ≥ 4 indicating analgesic need.

■ CONCLUSION

Feline aortic thromboembolism (FATE) obstructs the peripheral arteries through thrombus formation. Combined therapy with surgery, drugs, and acupuncture reduced pain, lowering the Feline Grimace Scale score from 9 to 0.

■ ASSOCIATED CONTENT

Supporting Information

[†]The pain progression in cats with FATE using the Feline Grimace Scale were submitted in PDF form as supporting information.

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