

CASE REPORT

Companion or pet animals

Combined inter-transversospinalis and erector spinae plane blocks for perioperative analgesia in a cat undergoing cervical injection-site sarcoma excision

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Abstract

An 11-year-old, 5.8-kg, neutered, male European shorthair cat was presented for surgical excision of an extensive injection-site sarcoma affecting the thoraco-cervical region. Premedication consisted of methadone, dexmedetomidine and alfaxalone, followed by induction with alfaxalone and maintenance with isoflurane. Perioperative analgesia was provided through a combination of ultrasound-guided erector spinae (ESP) and inter-transversospinalis plane (ITP) blocks, using ropivacaine 0.25% at a total dose of 2 mg/kg. The anaesthetic course was stable, and a single bolus of fentanyl (2 µg/kg intravenously) was administered during partial left scapulectomy. Postoperative analgesia was provided by intermittent administration of ropivacaine 0.5% (2 mg/kg every 8 hours) through a wound-soaker catheter. Pain scores remained low during the 48-hour monitoring period, and no rescue analgesia was required. This case highlights the feasibility and potential benefits of combining ESP and ITP blocks to achieve effective thoraco-cervical analgesia in cats undergoing extensive dorsal soft-tissue surgery.

KEYWORDS

analgesia, interfascial plane blocks, locoregional anaesthesia, ultrasonography

BACKGROUND

Feline injection-site sarcomas (FISS) are recurrent tumours in cats, typically associated with injection or trauma sites such as the interscapular region, lateral thoracic and abdominal walls, or the lumbar area.^{1,2} Because of their highly invasive nature in subcutaneous and muscular tissues, their management requires extensive surgery with recommended margins of 5 cm laterally and two muscular fascial planes in depth.^{2,3} The association with adjuvant treatments such as radiotherapy is highly recommended, as it significantly improves overall survival time.^{2,3} Such aggressive resections inevitably cause substantial tissue trauma and are therefore associated with marked intraoperative and postoperative pain. The main sources of nociception include muscle dissection, tissue traction and removal of the dorsal spinous processes or partial scapulectomy, performed in some cases to achieve adequate deep and lateral surgical margins.

Control of acute perioperative pain is essential not only for ethical reasons and to preserve animal welfare and quality of life, but it is also particularly relevant in oncological

surgery. Poorly managed pain can promote immunosuppression, reduce natural killer cell activity and facilitate tumour cell survival and metastasis.⁴ Conversely, effective analgesia mitigates the neuroendocrine and inflammatory stress responses that accompany major surgery, potentially decreasing the risk of tumour recurrence or dissemination.⁵

According to the 2022 ISFM Consensus Guidelines on the Management of Acute Pain in Cats, effective perioperative pain control requires a preventive and multimodal approach tailored to the individual patient.⁶ This involves combining systemic analgesics such as opioids, ketamine, alpha2agonists and non-steroidal anti-inflammatory drugs and, whenever possible, locoregional anaesthesia.

Beyond its analgesic efficacy, the use of locoregional anaesthesia in veterinary medicine has also been recently found to be associated with a reduction in anaesthesia-related mortality.^{7,8} These techniques are now recognised as key components of Enhanced Recovery After Surgery (ERAS) protocols in human^{9,10} and veterinary patients.^{11,12} By minimising intra- and postoperative nociception, reducing stress and opioid requirements, and promoting earlier return of normal physiological function, locoregional anaesthesia contributes

to improved recovery quality and reduced hospitalisation times.

In recent years, the implementation of ultrasound (US) has enabled the development of interfascial plane blocks, which involve injection of local anaesthetic (LA) between fascial layers where multiple sensory nerves course. The erector spinae plane (ESP) block, initially described in people¹³ and subsequently adapted to dogs^{14–16} and cats,^{17,18} involves injection of LA between the erector spinae muscle group and the transverse processes of thoracic or lumbar vertebrae. It produces multisegmental spread along the dorsal rami of the spinal nerves, providing analgesia to the epaxial muscles, vertebral structures, and the skin and fascial planes of the dorsolateral aspect of the trunk. Its clinical efficacy has been demonstrated in randomised clinical trials showing significant reductions in intraoperative nociceptive responses and postoperative pain scores in dogs undergoing hemilaminectomy.^{19–21} In feline species, however, current evidence remains limited to cadaveric studies describing the anatomical distribution of injectate in the lumbar¹⁷ and thoracic¹⁸ portion of the spine and a clinical case series, reporting the analgesic efficacy of the ESP block in three cats undergoing spinal surgery.²²

The inter-transversospinalis plane (ITP) block, recently described in canine cadavers, targets the plane between the multifidus cervicis and semispinalis capitis muscles, selectively staining the dorsal rami of the cervical spinal nerves.²³ Although its anatomical feasibility has been demonstrated in canine species, no clinical applications have yet been reported in either dogs or cats.

The aim of this case report is to describe the application of combined US-guided ITP and ESP blocks as part of a multimodal analgesic plan in a cat undergoing surgical excision of a FISS, and to discuss the potential advantages and implications of these techniques in feline clinical practice.

CASE PRESENTATION

An 11-year-old, 5.8-kg, neutered, male European shorthair cat was referred to the Oncologic Surgery Service of the Veterinary Teaching Hospital of the University of Liège for investigation and management of a 4 cm diameter interscapular subcutaneous mass, located near the site of the cat's microchip. The cat presented in good general condition, with normal appetite and behaviour. Physical examination revealed a heart rate (HR) of 180 beats per minute and a respiratory rate of 24 breaths per minute. Mucous membranes were pink and moist, with a capillary refill time of less than 2 seconds. Cardiac and pulmonary auscultation were unremarkable, and the body condition score was assessed as 7 out of 9.

INVESTIGATIONS

A complete haematology and serum biochemistry panel was performed upon admission, revealing no abnormalities. A computed tomography, performed for oncological staging under general anaesthesia, revealed the presence of an interscapular mass slightly lateralised to the left, in close contact with the supraspinatus muscle, showing fibrous extensions

LEARNING POINTS/TAKE-HOME MESSAGES

- The combined use of ultrasound-guided inter-transversospinalis (ITP) and erector spinae plane blocks can provide extensive analgesic coverage of the cervicothoracic region in cats undergoing major dorsal soft-tissue surgery.
- The ITP block, previously described only in canine cadavers, can be feasibly identified and performed in cats using ultrasonographic landmarks comparable to those of dogs.
- Placement of a wound-soaker catheter allows intermittent local anaesthetic administration, offering prolonged opioid-free postoperative analgesia.
- Successful implementation of opioid-sparing postoperative analgesic protocols requires structured pain assessment using validated pain scoring systems and appropriate postoperative monitoring.

directed toward the spinous process of the sixth cervical vertebra (C6), with no evidence of distant metastasis. The left prescapular lymph node appeared enlarged, but fine-needle aspiration showed no signs of metastasis. Histopathological examination of incisional biopsies confirmed the diagnosis of fibrosarcoma.

TREATMENT

One week later, the cat was scheduled for surgical excision of the mass with wide margins. On the day of surgery, the cat was subjectively deemed too stressed for intravenous (IV) catheterisation; therefore, premedication was administered intramuscularly and consisted of methadone (0.2 mg/kg; Comfortan 10 mg/mL, Dechra Veterinary Products), dexmedetomidine (5 µg/kg; Sedaxex 0.5 mg/mL, Dechra Veterinary Products) and alfaxalone (1 mg/kg). Approximately 15 minutes later, an IV 22-gauge catheter was aseptically inserted into the right medial saphenous vein. After 5 minutes of preoxygenation via a face mask, anaesthesia was induced with alfaxalone (2 mg/kg IV), and the trachea was intubated with a 4.5-mm internal diameter cuffed endotracheal tube. The cat was placed in sternal recumbency, connected to a paediatric Ayre's T-piece breathing system (Infant T-piece anaesthetic breathing system, Intersurgical) and allowed to breathe spontaneously. Isoflurane (Isoflutek; Alivira Animal Health) was delivered in 100% oxygen (1–1.5 L/min), and the vapouriser setting was adjusted to maintain end-tidal percentage of isoflurane between 1 and 1.2. Electrocardiography, pulse oximetry, systolic, mean (MAP) and diastolic arterial blood pressures measured by oscillometry, oesophageal temperature, inspired and expired isoflurane concentrations, and end-tidal carbon dioxide partial pressures were continuously monitored with a multiparameter monitor (Mindray ePM 12M Vet, Mindray Medical) and recorded at 5-minute intervals throughout anaesthesia. Oscillometric arterial blood pressure was measured using a cuff with a width corresponding to approximately 40% of the limb

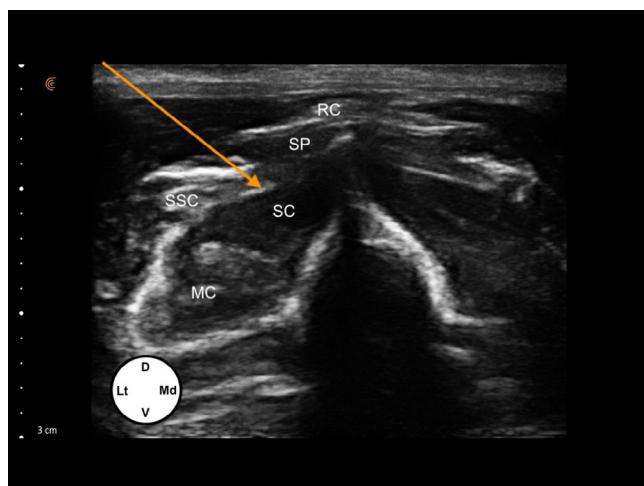


FIGURE 1 Ultrasound image and landmarks for the inter-transversospinalis plane block and needle trajectory (orange arrow). Image obtained with the cat in sternal recumbency and the transducer positioned transversely along the dorsal midline of the caudal aspect of the neck at the level of the fifth cervical vertebra. ESP = erector spinae muscle group; D, dorsal; Lt, lateral; MC, multifidus cervicis muscle; Md, medial; RC, rhomboides cervicis muscle; SC, spinalis cervicis muscle; SP, splenius muscle; SSC, semispinalis capitis muscles; V, ventral.

circumference, placed around the left forelimb. Approximately 40 minutes after induction, the HR gradually decreased from 125 to 100 beats per minute, while the MAP dropped to 55 mmHg. Glycopyrrolate (10 µg/kg; Robinul-V, 0.2 mg/mL, Vetoquinol) was therefore administered IV, resulting in an increase in HR to 140 beats per minute and MAP to 75 mmHg. Once cardiovascular variables had stabilised, bilateral US-guided ESP and ITP blocks were performed, as described for dogs,^{14,23} using a 14 MHz high-frequency linear transducer (L7HD3VET; Clarius Mobile Health), connected to a touchscreen tablet (iPad Air, fifth generation, Apple). The dorsolateral aspect of the neck and thorax was clipped and aseptically prepared. For the ITP block, the US transducer was positioned transversely along the dorsal midline of the caudal aspect of the neck, to visualise the spinal process and lamina of C5 and the transversospinalis muscles (Figure 1). Using an in-plane, along visual axis technique, an echogenic needle (NanoLine SonoPlex STIM 22 G × 50 mm, Pajunk) was inserted through the epaxial musculature in a latero-medial direction until the tip was positioned into the interfascial plane between the spinalis cervicis and the semispinalis capitis muscles (Figure 2). Subsequently, a volume of 0.15 mL/kg of ropivacaine 0.25% was injected. The same procedure was repeated on the contralateral side. For the ESP block, the US probe was positioned in sagittal orientation to the spine, just laterally to the midline, to visualise the erector spinae muscles and transverse process of T5. Then, the needle was advanced in plane in a caudo-cranial direction until the tip contacted the lateral aspect of the transverse process of T5, and a volume of 0.3 mL/kg per side of ropivacaine 0.25% was injected bilaterally. The total dose of ropivacaine administered through ITP and ESP blocks corresponded to 2 mg/kg.

The cat was moved to the operating theatre and connected to a paediatric rebreathing circuit (Universal F, King System). Cefazolin sodium (20 mg/kg IV; Cefazoline 1 g, Sandoz) was administered 20 minutes before surgery and re-dosed every 90 minutes thereafter. Thermal support through the whole

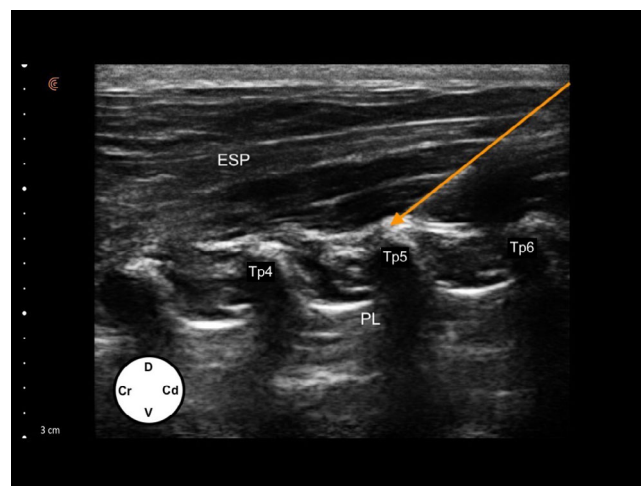


FIGURE 2 Ultrasound image and landmarks for the thoracic erector spinae plane block and needle trajectory (orange arrow). Image obtained with the cat in sternal recumbency and the transducer positioned in a sagittal orientation immediately lateral to the dorsal midline at the level of the fifth thoracic vertebra. Cd, caudal; Cr, cranial; ESP, erector spinae muscle group; PL, pleura; TP, transverse process; V, ventral.

procedure was provided through a 3 M Bair Hugger Warming Blanket System.

A nociceptive response was predefined as an increase of at least 20% in HR or MAP, sustained for more than 1 minute, compared with baseline values recorded immediately before the change. In the event of such a response, an IV rescue bolus of fentanyl (2 µg/kg; Fentadon 50 µg/mL, Dechra Veterinary Products) was planned. If the response had been inadequate, a fentanyl constant-rate infusion would have been initiated and titrated to effect.

Surgery started 35 minutes after execution of ITP and ESP blocks. A skin marker was used to delineate the lateral, caudal and cranial margins (Figure 3A). A skin incision was made around the mass, with surgical margins of 5 cm caudally and laterally (on both sides) and 4 cm cranially. The deep margins included the spinous processes of C5 to C7, the left scapular spine, the left supraspinatus muscle and portions of the trapezius, rhomboides, omotransversarius, serratus ventralis and cutaneous trunci muscles (Figure 3B). Cardiovascular parameters remained stable throughout most of the surgery (HR 100–120 beats per minute; MAP 75–90 mmHg). A single nociceptive episode occurred during the partial left scapulectomy, characterised by an increase in HR from 120 to 140 beats per minute and in MAP from 75 to 110 mmHg, for which one bolus of fentanyl (2 µg/kg) was administered as rescue analgesia. At that time, oesophageal temperature was 35.0°C. The left prescapular lymph node was also removed en bloc together with the tumour and adjacent tissues. A 5 cm-long wound-soaker catheter (WSC) (Diffusion catheter, Mila International) for intermittent postoperative administration of ropivacaine was placed within the defect (Figure 3C). Reconstruction of the muscle groups was performed by apposing the remaining portions of the muscles, taking care to cover as much as possible of the bony surface of the left scapula, and the wound was then routinely closed in layers under moderate tension. A semi-compressive bandage was applied to provide comfort and limit possible movements of the scapular region. Isoflurane was discontinued at the end of the procedure. The total duration of surgery and

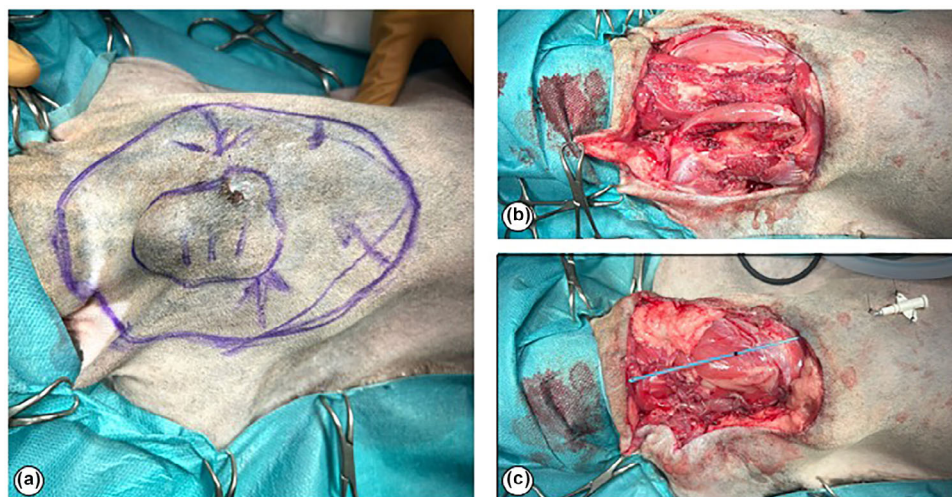


FIGURE 3 (a) Delimitation of lateral, caudal and cranial margins after measurement (4–5 cm). (b) Intraoperative view after tumour resection, including deep margins with partial myectomy. The deep margins comprised the spinous processes from the fifth to the seventh cervical vertebra, the left scapular spine, the left supraspinatus muscle, and portions of the trapezius, rhomboideus, omotransversarius, serratus ventralis and cutaneous trunci muscles. (c) Surgical reconstruction of muscular planes and placement of the wound soak catheter covering the entire surgical site.

anaesthesia was 114 and 208 minutes, respectively. Before recovery, meloxicam (0.05 mg/kg; Meloxidolor 5 mg/mL, Dechra) was administered subcutaneously (SC).

OUTCOME AND FOLLOW-UP

Recovery from anaesthesia was smooth, and the cat was extubated 4 minutes after isoflurane discontinuation. At that time, the body temperature was 34.4°C. The patient was transferred to the Intensive Care Unit, where oxygen was administered via face mask, and active rewarming continued until the rectal temperature reached 37°C.

Once fully recovered, the cat was bright, comfortable, and able to stand and move unassisted, voluntarily eating approximately 5 hours after extubation. A total of 2 mL of 0.5% ropivacaine (2 mg/kg) was administered through the WSC 8 hours after the ITP and ESP blocks, and subsequently every 8 hours for 48 hours postoperatively.

Postoperative pain was assessed hourly during the first 4 hours after extubation and every 4 hours thereafter using the short-form Glasgow Composite Measure Pain Scale for cats (GCMPS-Feline).²⁴ Intravenous methadone (0.2 mg/kg) was given as rescue analgesia when the GCMPS-Feline score was $\geq 5/20$. Additional medications included meloxicam (0.05 mg/kg SC once daily) and cefazolin (20 mg/kg IV three times daily).

Throughout the 48-hour hospitalisation, pain scores remained below the intervention threshold, and no rescue methadone was required. The postoperative course was uneventful, and the cat was discharged 48 hours after surgery, following removal of the WSC, with meloxicam (0.05 mg/kg per os once daily) prescribed for a further 5 days.

The postoperative histopathology report revealed features of a FISS of intermediate grade, with clean margins in all planes of section. The left prescapular lymph node showed no evidence of metastatic cells. A clinical follow-up performed 10 days after surgery demonstrated good wound healing and satisfactory mobility, with only mild lameness.

DISCUSSION

This case report describes the successful use of combined US-guided ITP and ESP blocks as part of a multimodal analgesic protocol in a cat undergoing wide excision of a cervical FISS. The combination of these two interfascial plane blocks with the intermittent ropivacaine administration through WSC resulted in stable intraoperative haemodynamics, minimal nociceptive responses, and opioid-free postoperative analgesia. To the authors' knowledge, this represents the first clinical description of the ITP block and the first report of its combined application with the ESP block in the feline species. The rationale for performing both ITP and ESP blocks in this case was to achieve broad desensitisation of the dorsal cervical and cranial thoracic regions, which were extensively involved by the surgery. The ITP block targets the space between the multifidus cervicis and semispinalis capitis muscles, where the dorsal branches of the cervical spinal nerves course. In a previous anatomical study performed in dogs, injectate distribution was shown to extend from C2 to T1, suggesting potential coverage of the caudal cervical and cranial thoracic dermatomes.²³ Currently, there are no cadaveric studies describing this technique in feline species. In the present case, the ITP block was performed following the anatomical landmarks and US approach described for dogs, and the relevant fascial planes and bony structures were easily identified, appearing comparable to those previously reported in the canine species. Findings from this report align with previous human studies in which a multifidus cervicis plane block provided effective analgesia for cervical spine surgery,^{25,26} further supporting the potential applicability of this approach also in veterinary patients.

The ESP block provides analgesia through injection of LA between the erector spinae muscle group and the transverse processes of the thoracic vertebrae, resulting in multisegmental diffusion along the fascial plane and spread to the dorsal rami of the thoracic spinal nerves.¹⁴ Previous studies have demonstrated the clinical efficacy of the ESP block in dogs, showing reduced intraoperative nociceptive responses, lower

postoperative pain scores, and decreased opioid consumption in patients undergoing hemilaminectomy.^{19–21} In cats, a small clinical case series reported satisfactory analgesia in three cats undergoing lumbar spinal surgery.²² The authors of that report used bupivacaine 0.5% at a total dose ranging from 1.8 to 2.5 mg/kg; however, as it was not specified whether the ESP block was performed unilaterally or bilaterally, it is not possible to extrapolate the exact injection volumes. In a previous cadaveric study investigating the ESP block in the feline lumbar region, injection of 0.4 mL/kg of dye solution resulted in staining of 2.8 ± 1.3 dorsal rami of the spinal nerves.¹⁷ As no cadaveric studies had yet evaluated the injectate distribution following thoracic ESP block in the feline species at the time of this cat's surgery, in the present case we chose to use a volume of 0.3 mL/kg per side, consistent with data from the study by Portela et al. (2021) in dogs.¹⁴ According to their findings, this volume allowed diffusion to approximately four medial and lateral branches of the spinal nerves. In the current case, the injection was performed at the level of T5, with the needle advanced in a caudo-cranial direction, aiming to achieve diffusion towards the dorsal rami of the spinal nerves between T1 and T5, which may not be covered by the ITP block but included within the surgical field. Very recently, a cadaveric study investigating the spread of solution after ESP block in the thoracic portion of the feline spine has been published.¹⁸ In that study, injection of 0.4 mL/kg at T7 consistently resulted in spread throughout the epaxial musculature and frequent staining of the dorsal branches of the thoracic spinal nerves, particularly between T6 and T8.

Intraoperatively, the combination of ITP and ESP blocks resulted in effective analgesia throughout most of the surgery, as indicated by the stable haemodynamic parameters and the absence of nociceptive responses for most of the intervention. Only a single bolus of rescue fentanyl was required during partial scapulectomy, likely reflecting incomplete blockade of the scapular region. Although oesophageal temperature at the time of fentanyl administration was 35.0°C, and progressive hypothermia may have attenuated cardiovascular responses to nociceptive stimulation, the sustained increase in both HR and MAP was considered consistent with breakthrough nociception. The scapula receives sensory innervation from ventral rami of the spinal nerves between T2 and T4.²⁷ These latter structures are not expected to be consistently desensitised by ESP and ITP blocks, which may explain the transient nociceptive response observed during scapular manipulation.^{14,18,23} Nonetheless, the limited requirement for opioid supplementation supports the potential efficacy of these blocks in providing extensive analgesic coverage of the dorsocervical and thoracic regions involved in this type of surgery.

Although interfascial plane blocks are considered relatively less invasive than traditional neuraxial or paravertebral techniques, as the target fascial planes are generally superficial and located farther from important anatomical structures, they are not free from complications. In the cadaveric study by Herrera-Linares et al. (2025), inadvertent epidural spread of injectate was observed in two specimens following the ITP block. This finding suggests a potential risk of unintentional neuraxial diffusion, especially if the needle is advanced too deeply.²³ Clinical effects of cervical epidural spread, such as sympathetic blockade and hypotension, phrenic nerve

paralysis or Horner's syndrome, were not observed in this case. However, clinicians should be aware of these potential complications when performing the ITP block. Similarly, in the context of the ESP block, cadaveric studies have rarely reported epidural or paravertebral spread of injectate.^{14–16,18} While such spread may contribute to the analgesic effect,^{19,28} it also underscores the potential risk for local anaesthetic systemic toxicity (LAST), secondary to migration of injectate to the epidural space, as reported in previous studies conducted in dogs.^{28,29} Pneumothorax, haematoma formation, thoracic or abdominal organs puncture remain theoretical risks, although they have not been documented in veterinary species to date.³⁰

The marked hypothermia observed intra- and postoperatively was likely multifactorial and may have been related to prolonged anaesthetic time and extensive clipping and surgical exposure required for this procedure. In this case, because of the dorsal surgical approach, the forced-air warming blanket was positioned underneath the cat. Given the cat's overweight body condition, partial compression of the perforated blanket may have limited warm-air circulation and reduced heat transfer to the patient.

The use of WSCs enables intermittent or continuous administration of LAs directly into the surgical field, providing sustained postoperative analgesia with minimal systemic drug administration. Their placement is technically simple, cost-effective, and allows targeted somatic desensitisation of the incision and surrounding muscle planes.³¹ In the present case, the intermittent administration of ropivacaine through WSC in combination with meloxicam provided effective opioid-free postoperative analgesia for 48 hours. The 8-hour dosing interval was selected based on the reported duration of action of ropivacaine (approximately 5–12 hours for sensory blockade).³² This interval was considered a pragmatic compromise to maintain continuous analgesia while minimising fluctuations in the analgesic effect between administrations. However, this favourable outcome should be interpreted in the context of structured postoperative monitoring. Pain was assessed at predefined intervals using the validated short-form GCMPs-Feline by trained hospital staff, allowing prompt identification and treatment of breakthrough pain if required. Therefore, caution should be exercised when extrapolating an opioid-free strategy to settings where structured pain assessment and close postoperative monitoring cannot be ensured. Although no direct conclusions can be drawn from this single case, limiting perioperative opioid administration may represent an additional benefit in oncological patients, as some experimental evidence suggests potential immunomodulatory and pro-tumour effects of opioids.⁵ Several studies demonstrated the efficacy and safety of WSC following extensive oncological and orthopaedic procedures, with variable rates of complications, infection or mechanical failure.^{33–35} In a retrospective review of 56 cases, Abelson et al. (2009) reported that WSCs were typically maintained for 1.6 ± 0.5 days, with issues such as disconnection of the catheter from the infusion in 7.7% of cases, one seroma and one suspected lidocaine neurotoxicity. No increase in surgical site infections was recorded compared with historic controls.³³ More recently, a multicentric feline retrospective study including 166 cats³⁴ reported an overall complication rate of 13.2%, all of which were minor and self-limiting. Wound-related issues

such as oedema, seroma or partial dehiscence occurred in 7.8% of cases, while drug-delivery complications (5.4%) were mainly related to catheter dislodgement or resistance during injection. The only variable associated with an increased risk of complications in that study was the administration of a volume of LA higher than 2.5 mL per injection. Kazmir-Lysak et al. (2023) hypothesised that larger injection volumes may require longer absorption times, thereby favouring local wound complications.³⁴ In the present case report, the volume injected corresponded to 2 mL, and no complications associated with the WSC were recorded during the postoperative period. However, careful monitoring for signs of LAST, such as hypersalivation, mydriasis, muscle twitching, hypoventilation and generalised neurological and cardiovascular depression,^{36–38} is advised, particularly in feline patients, which may be more susceptible to these effects.³⁹ In our case, dilution of ropivacaine to 0.25% allowed administration of an adequate volume of LA while maintaining the total dose within the recommended maximum dose for cats (2 mg/kg).

These findings suggest that the combined use of US-guided ITP and ESP blocks, together with structured postoperative pain assessment, may be a promising option to enhance perioperative analgesia in cats undergoing extensive oncological cervicothoracic surgery. Further cadaveric and clinical studies are warranted to better evaluate the anatomical distribution, injection technique and optimal dosing of LAs, and to evaluate the reproducibility and efficacy of these interfascial plane blocks in feline patients.

AUTHOR CONTRIBUTIONS

Alexandra-Gloria Marculescu, Rafael Bernardes and Massimiliano Degani were involved in the clinical management of the case. **Alexandra-Gloria Marculescu, Massimiliano Degani, Rafael Bernardes and Annick Hamaide** were involved in data treatment, interpretation and preparation of the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

FUNDING INFORMATION

The authors received no specific funding for this work.

ETHICS STATEMENT

By signing the admission form, owners gave written informed consent for the collection of data from their cat and its publication in an anonymised format. Ethical review and approval were not required for the animal study, because this case report has been written using data collected in a clinical setting. No research has been performed on the patient.

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MULTIPLE-CHOICE QUESTION

In this cat, a single nociceptive response occurred during partial left scapulectomy despite bilateral ITP and ESP blocks. What is the most likely explanation?

POSSIBLE ANSWERS TO MULTIPLE-CHOICE QUESTION

The local anaesthetic dose was insufficient to desensitise the cervical dorsal rami.

The scapular region receives sensory innervation from ventral rami of thoracic spinal nerves, which are not expected to be desensitised by ITP and ESP blocks.

The wound-soaker catheter failed to provide intraoperative analgesia.

The ESP block selectively desensitises only lumbar spinal nerves.

Ropivacaine is ineffective for interfascial plane blocks in cats.

CORRECT ANSWER

The scapular region receives sensory innervation from ventral rami of the spinal nerves between T2 and T4, whereas ITP and ESP blocks primarily target dorsal rami and dorsal cervicothoracic structures.