

# Chronic Pain Syndrome OF FELINE ONYCHECTOMY

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**F**eline patients who have had onychectomy (declaw) may experience chronic pain. Owners of such cats usually report one of several concerns, the most common of which is fear that the cat is still in pain, especially in the fore paws, because it seems to walk very lightly on those feet, as if walking on nails or glass. Another common concern is behavioral changes, which may include decreased activity, decreased appetite, or increased aggression. The inciting cause for these presentations within days to months to years is usually the lack of adequate acute pain control in the immediate postoperative period. While owners may not bring their cats in for the problem early, it becomes apparent from the history that the pain, which the cat is manifesting as some problem, began sometime soon after the declaw procedure.

Courtesy Dr. Jacqueline C. Neilson



## How Do I Alleviate the Pain?

Initially, a thorough physical examination that isolates the discomfort to the paw or paws that are actually causing the discomfort is essential. The next step in alleviating the pain is to rule out underlying physical problems, such as the presence of a residual piece of bone. Quality radiographs of the affected feet are important in diagnosing this problem. If the source of pain is not surgically correctable, then it is probably a pathophysiologic disorder of the spinal cord.

Chronic pain in the absence of a noxious stimulus may be related to the wind-up phenomenon, which can develop during a surgical procedure or in the days to weeks afterward.<sup>1</sup> The wind-up phenomenon, also known as central neuronal hypersensitization, involves activation of N-methyl-D-aspartate receptors. As wind-up develops, the central neurons begin to exaggerate the signal that enters the spinal

cord, making the stimulus seem to be more intense than it actually is and increasing pain. Analgesics have little or no effect in alleviating pain associated with the wind-up phenomenon.

Treatment for this type of declaw pain involves simultaneously treating the wind-up phenomenon and providing analgesia. Treatment of wind-up basically involves resetting the

receptors so that the spinal cord can process nociceptive input in an appropriate manner, allowing analgesics to work more effectively. Wind-up can be treated with N-methyl-D-aspartate–receptor antagonists.

## Amantadine

Currently, there is one oral N-methyl-D-aspartate–receptor antagonist available, amantadine, although use is considered off-label for both humans and animals. This drug should be given at 3 mg/kg PO Q 24 H for 21 days (see **Protocol for Alleviation of Chronic Declaw Pain**). Based on clinical experience, adverse behavioral effects of amantadine start at 5 to 6 mg/kg PO, but toxicity does not develop until approximately twice that amount is given.<sup>2</sup>

Amantadine has few if any analgesic properties. Therefore, while it helps the spinal cord to process stimuli more appropriately, the patient

continues

# COMPLICATIONS

will need a primary analgesic to alleviate pain. Cats should simultaneously receive effective opioid analgesia in the form of buprenorphine 0.01 to 0.02 mg/kg buccally Q 12 H for 2 to 3 days.<sup>3,4</sup> If the cat becomes sedated after 2 days, discontinue the buprenorphine. If sedation develops in less than 2 days, the dose should be decreased to provide some analgesia without producing adverse effects.

## Meloxicam

Cats should also receive meloxicam on a progressively decreasing dosing schedule for 21 days. The initial dose should be 0.05 mg/kg PO daily for 4 days; then 0.05 mg/2 kg PO daily for 4 days; then 0.05 mg/cat PO daily for 4 days; and finally 0.05 mg/cat every other day for 5 days. If at any time the cat develops signs of illness, such as anorexia, vomiting, or diarrhea, discontinue the meloxicam and assess kidney and liver function. As with repeated administration of any NSAID, it is possible to overwhelm a cat's ability to metabolize meloxicam. The dosing schedule given here is unlikely to have adverse effects. Meloxicam should not be used in cats with underlying kidney or liver disease.

## Results

Currently, 12 cats who have been presented to the Animal Anesthesia and Pain Management Center with residual declaw pain have had 100% resolution based on this protocol. All these cats were systemically normal, and none of them had any apparent adverse effects requiring alteration of doses. There are no laboratory data to indicate a drug interaction among buprenorphine, amantadine, and meloxicam, and clinical experience has not shown any evident problems.

## How do I prevent the pain syndrome?

The best way to prevent chronic postoperative pain is to use an aggressive perioperative analgesic plan. The plan should be multimodal in approach (i.e., it should include drugs that work at various parts of the nociceptive pathway) to produce better overall analgesia.

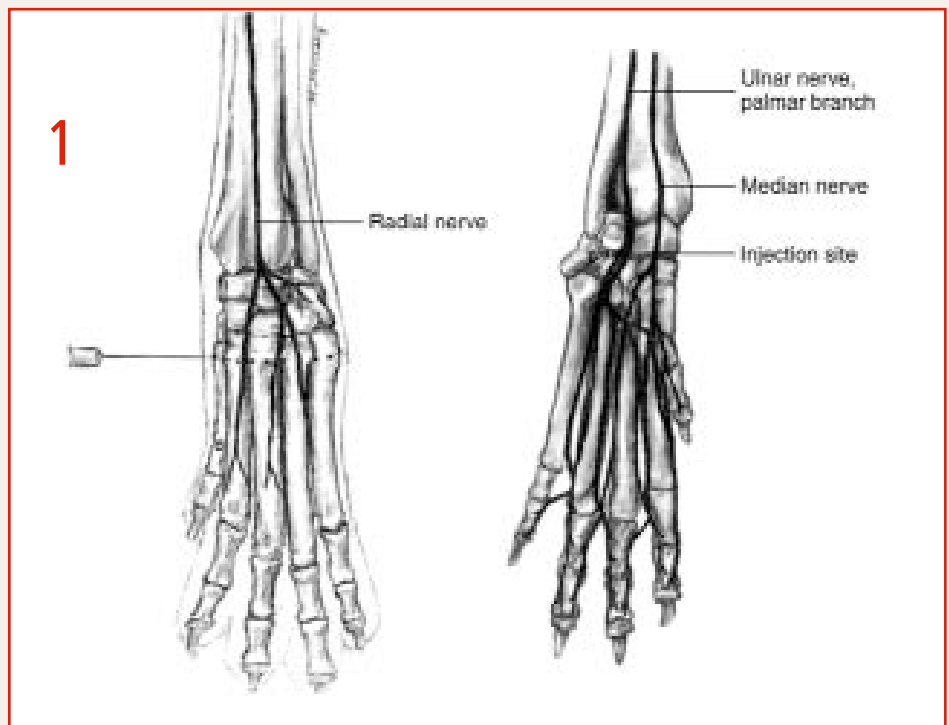
## Multimodal Premedication

Initially, the plan involves adequate premedication (see **Protocol for Preventing Acute & Chronic Declaw Pain**). An efficacious protocol involves combination of an  $\alpha_2$ -agonist to induce a centrally mediated analgesic and sedative effect, a  $\mu$ -receptor opioid agonist for analgesia, and an anticholinergic. The com-

bined  $\alpha_2$ -agonist/ $\mu$ -receptor opioid agonist induces excellent preemptive analgesia and sedation. Examples of  $\alpha_2$ -agonists include medetomidine 20 mg/kg and xylazine 0.5 mg/kg. An efficacious opioid is hydromorphone 0.1 mg/kg.<sup>5,6</sup> Atropine or glycopyrrolate can be administered at conventional doses to decrease the likelihood of bradycardia from the other drugs. They may be combined into one syringe and administered subcutaneously.

## Anesthesia

Anesthesia may be induced in any conventional IV fashion. After the cat is anesthetized, perform a declaw block (**Figure 1**) using lidocaine 1.5 mg/kg total dose combined with bupivacaine 1.5 mg/kg. This is the total dose to be used for any number of feet to be declawed. Inject a line block of the local anesthetic subcutaneously from medial to lateral



Anatomical landmarks for declaw block

Photo Credit

Figure 1. Reprinted from Local and regional anesthesia techniques for alleviation of perioperative pain. Gaynor JS, Mama KR. In Gaynor JS, Muir WW (eds): *Handbook of Veterinary Pain Management*—Mosby: St Louis, 2002, p 270, with permission.

on the dorsal aspect of the paw just distal to the carpus. A bleb of local anesthetic is also injected subcutaneously just proximal to the accessory carpal pad on the palmar aspect of the paw.

### Postsurgical Intervention

After surgery, the cat is given buprenorphine 0.02 mg/kg SC 4 hours after hydromorphone administration to achieve continuous opioid analgesia before the hydromorphone wears off; then 0.01 to 0.02 mg/kg buccally Q 12 H for 2 days.<sup>3,7</sup> Cats are also given meloxicam 0.2 mg/kg SC during the recovery phase of the declaw procedure, followed by 0.05 mg/kg PO daily for 4 days then 0.05 mg/2 kg PO daily for 4 days.

This is an aggressive preventative analgesic protocol for a very common, extremely painful procedure. While there have not been prospective, double-blind, placebo-controlled studies to validate this combination of analgesics, most practitioners would agree that pain has not been adequately alleviated when only a single drug is used. The multimodal approach to pain control described here is a common approach and very important as the severity of pain increases. Following these concepts should allow practitioners to prevent problem declaw pain or to treat it when it occurs. If pain persists, a consultation between the veterinarian and the client should be held to formulate a pain alleviation plan of greater duration to achieve an acceptable final outcome. ■

See Aids & Resources, back page, for references, contacts, and appendices.



### Protocol for Alleviating Chronic Declaw Pain

- Confirm pain is from paw.
- Radiograph paw to rule out bone fragments.
- Give amantadine 3 mg/kg PO daily for 21 days.
- Give buprenorphine 0.01–0.02 mg/kg buccally Q 12 H for 2–3 days.
- Give meloxicam 0.05 mg/kg PO daily for 4 days; then 0.05 mg/2 kg PO daily for 4 days; then 0.05 mg/cat PO daily for 4 days; then 0.05 mg/cat every other day for 5 days.

*Note: The units for meloxicam administration are based on 0.05 mg, which is approximately 1 drop of meloxicam from the bottle, thus making dosing easy.*

### Protocol for Preventing Acute & Chronic Declaw Pain

- Premedicate with:
  - medetomidine 20 µg/kg (or other  $\alpha_2$ -agonist for sedation and analgesia)
  - +
  - hydromorphone 0.1 mg/kg (or some other effective opioid in cats, such as buprenorphine),<sup>7</sup> and
  - +
  - atropine 0.02–0.04 mg/kg (or glycopyrrolate 0.01 mg/kg).
 Combine in one syringe and administer SC.
- Induce anesthesia with diazepam/ketamine, propofol, or thiopental IV.
- Perform a declaw nerve block with lidocaine 1.5 mg/kg combined with bupivacaine 1.5 mg/kg as a total dose
- Give meloxicam 0.2 mg/kg SC during recovery from declaw, followed by 0.05 mg/kg PO daily for 4 days; then 0.05 mg/2 kg PO daily for 4 days.
- Give buprenorphine 0.02 mg/kg SC 4 hours after hydromorphone administration; then 0.01 to 0.02 mg/kg buccally Q 12 H for 2 days.

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