

Summary of Articles Studying Surgical Declawing of Domestic Cats

The Washington State Veterinary Medical Association formed the Feline Declawing Task Force to examine the issue of surgically declawing domestic cats. The task force reviewed the available scientific literature studying the subject and summarized the most salient points of pertinent articles below. Additional studies specific to evaluating pain management strategies were not included in this summary due to their narrow area of focus, which was outside the scope of the task force's charge. It is important to emphasize that overall, little research studying the issue of declawing outside the realm of pain management has been conducted.

Note: This document is for informational purposes only and not intended to promote a particular point of view. Those who are interested in the topic are encouraged to read the articles in full.

The articles below are listed in chronological order from date of publishing.

Kaplan, J., Benson, C., Holmes, K., Brooks, J., Pau, A., Masur, H. [Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents. Recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. MMWR 2009; 58:1-198.](#)

- HIV-infected persons are at high risk for severe disease caused by *B. henselae*. The major risk factors for acquisition of *B. henselae* are contact with cats infested with fleas and receiving cat scratches.
- Persons who acquire a cat should acquire an animal aged >1 year and in good health. Cats should be acquired from a known environment, have a documented health history, and be free of fleas. Stray cats and cats with flea infestation should be avoided. Patients should avoid contact with fleas, flea feces ("flea dirt"), and any cat-associated wound should be washed promptly. Care of cats should include a comprehensive, ongoing flea-control program under the supervision of a veterinarian.
- Declawing is not advised, but HIV-infected persons should avoid rough play with cats and situations in which scratches are likely.

Holmberg, D., Brisson, B. [A prospective comparison of postoperative morbidity associated with the use of scalpel blades and lasers for onychectomy in cats. Can Vet J 2006; 47:162-163.](#)

- This study compared the postoperative pain of 9 healthy cats who underwent declaw surgery using a scalpel blade on one forelimb and a CO2 surgical laser on the contralateral limb. Pain was subjectively evaluated twice daily for the 10 days following surgery.
- Significant improvement in pain was found for both groups until postoperative day 8. Differences in pain scores between the two groups were not significant when compared on individual days, and neither treatment group showed an observable lameness by day 9.

Cooper, M., Lavery, P., Soiderer, E. Bilateral flexor tendon contracture following onychectomy in 2 cats. Can Vet J 2005; 46:244-246.

- The early postoperative complication rate following onychectomy is approximately 50%. Complications include pain, hemorrhage, laceration of the digital pad, swelling, reluctance to bear weight on the affected limbs, neuropraxia from improper tourniquet use, and lameness. The late complication rate following surgery is approximately 19.8%. Complications include infection, tissue necrosis from improper bandaging, wound dehiscence or incomplete healing with protrusion of P2, regrowth from the unguis process of P3, scars (production of deformed claw segment from epithelial cells of the unguis crest), retention of flexor process of P3, chronic draining tracts, palmigrade stance, and chronic intermittent lameness.
- This is a case report of two individual cats who presented for chronic pain, lameness, and fixation of forelimb digits in flexion following onychectomy. One cat was evaluated 6 weeks after onychectomy. The other was evaluated 3 months after onychectomy. That cat also had hyperostosis of the distal half of P2 in essentially all digits and minimal soft tissue coverage over the distal ends of P2. Both cats were treated with staged tenectomies of the deep digital flexor tendon and recovered.
- The etiology of the tendon contracture is unknown, but hypothesized to be a result of postoperative inflammation due to excessive/rough tissue manipulation, a dull scalpel blade, improper use of tissue adhesives, or poor aseptic technique.

Gaynor, J. Chronic pain syndrome of feline onychectomy. NAVC Clinician's Brief 2005; 11-13.

- Pain and behavioral problems secondary to pain may arise within days to years after declawing. The author speculates that chronic pain syndrome is attributed to inadequate analgesia in the immediate post-operative.
- Chronic pain may be due to anatomical issues (bone remnants, claw regrowth) or wind-up phenomenon.
- The author recommends a specific multimodal approach to preventing and acute and chronic declaw pain. It includes pre and post-operative pain control extending days past the surgery.
- The author also recommends a specific multimodal treatment protocol to alleviate chronic pain. This protocol successfully treated 12 of 12 cats that presented to the author's hospital.

Romans, C., Gordon, W., Robinson, D., Evans, R., Conzemius, M. Effects of postoperative analgesic protocol on limb function following onychectomy in cats. JAVMA 2005; 227:89-93.

- Onychectomy is a painful surgery. Untreated pain can result in complications.
- This study used pressure-platform gait analysis to compare the analgesic effects of three different pain management protocols: post-operative topical bupivacaine, post-operative intramuscular butorphanol, and pre-operative transdermal fentanyl to alleviate the pain of unilateral onychectomy. It included 27 healthy cats. No control group was included due to humane considerations. Gait analysis was performed 1, 2, 3, and 12 days post-operatively.
- One cat in the bupivacaine group was removed from the study due to severe post-operative pain that required rescue analgesia.
- For all 3 groups, peak vertical force and vertical impulse were significantly decreased the day after surgery, compared to baseline. Values increased progressively during the subsequent days. The opioids provided similar analgesia and better analgesia than bupivacaine. However, the values for all 3 groups were still significantly decreased compared to baseline at 12 days post-op when the study concluded.

Therefore, the authors recommend continuing post-operative pain control at least through 12 days post-operatively.

Chomel, B., Boulouis, H., Breitschwerdt, E. [Cat scratch disease and other zoonotic Bartonella infections. JAVMA 2004; 224:1270-1279.](#)

- Cat scratch disease is more commonly seen in young cats with fleas. People who want to avoid transmission, particularly immunocompromised people, should seek an adult cat from a flea-controlled environment.
- Flea control is the best method of preventing cat scratch disease transmission.
- Onychectomy is of limited use in preventing cat scratch disease as the infection is also transmitted via flea bites. Therefore, flea control, personal hygiene (hand washing, especially of any cuts, bites, or scratches) and behavioral modification to avoid biting or scratching are considered the most effective control measures.

Romans, C., Conzemius, M., Horstman, C., Gordon, W., Evans, R. [Use of pressure platform gait analysis in cats with and without bilateral onychectomy. AJVR 2004; 65:1276-1278.](#)

- The purposes of the study were to determine whether limb function could be measured in cats by use of pressure platform gait analysis, describe the vertical forces found in clinically normal cats, and compare those forces with those of cats that underwent onychectomy more than 6 months prior to the study. There were 13 healthy cats in each group.
- Gait analysis was successfully performed. There were no significant differences in mean gait velocity, acceleration, peak vertical force, or vertical impulse between groups.

Mison, M., Bohart, G., Walshaw, R., Winters, C., Hauptman, J. [Use of carbon dioxide laser for onychectomy in cats. JAVMA 2002; 221:651-653.](#)

- This study compared the use of CO2 laser with the scalpel technique for onychectomy with regard to postoperative signs of discomfort and complications. 20 healthy cats participated in the study. Each cat had both techniques performed, one per limb. Lameness, pain, swelling, hemorrhage, and discharge was assessed for 24 hours and again at a re-check 7 days after surgery.
- The laser technique resulted in lower discomfort and complication scores on the first day, but there were no differences between the groups at the one week re-check. The authors did not believe the differences observed were clinically important.

Patronek, G. [Assessment of claims of short and long term complications associated with onychectomy in cats. JAVMA 2001; 219:932-937.](#)

- This paper reviewed 19 articles which studied medical or behavioral complications associated with onychectomy. Overall, little research has been conducted to assess complications associated with declawing.

- Feline onychectomy is an elective surgical procedure primarily performed to prevent property damage or personal injury from scratching. Approximately 24.4% of owned cats in the United States are declawed.
- The most common early postoperative complications are hemorrhage and pain.
- Later postoperative complications may include claw regrowth, radial nerve paralysis secondary to tourniquet use, chronic draining tracts, infection, wound dehiscence or incomplete healing, protrusion or loss of the second phalanx, tissue necrosis from improper bandage placement, development of a palmargrade stance, persistent lameness, cystitis, asthma, skin disorders, housesoiling, and increase in frequency or severity of biting.
- The medical or short term complication rates in the reviewed literature ranged from 0 to 40%.
- The long term complication rate in the reviewed literature was approximately 20%, but only five studies assessed long term complications.
- There is very little research available on behavioral complications and includes 3 retrospective studies, one internet survey of cat owners, and one mail survey of veterinarians. The behavioral complication (housesoiling, increase in frequency or severity of biting) rate ranged from approximately 4 to 33% of declawed cats.

Yeon, S., Flanders, J., Scarlett, J., Ayers, S., Houpt, K. Attitudes of owners regarding tendonectomy and onychectomy in cats. JAVMA 2001; 218:43-47.

- This study compared owners' reasons for surgery and changes in the cats' behavior following surgery. It also assessed owners' impressions of recovery time, benefits and concerns regarding each surgical procedure, and overall attitude regarding surgery.
- Scratching is an inherited normal behavior in cats. Most undesirable scratching can be prevented or eliminated with environmental manipulation and behavior modification. Owners who are unwilling or unable to use these methods may elect for surgery to control the undesirable scratching.
- The most common surgical complications following onychectomy or tendonectomy are pain, bleeding, swelling, and dehiscence. Tendonectomy also leads to rough claws that grow excessively and require regular trimming.
- Owners of 57 from 98 cats who underwent the surgeries during a 5 year period responded to the study. 39 of these cats underwent onychectomy, while 18 underwent tendonectomy. The follow-up period ranged from 2 months to 5.4 years post-op.
- Reasons for electing surgery included: scratching household materials (69% of onychectomy and 78% of tendonectomy patients), concern for injury to humans (49% of onychectomy and 17% of tendonectomy patients), concern for injury to other household pets (26% of onychectomy and 6% of tendonectomy patients), desire to keep the cat indoors (90% of onychectomy and 67% of tendonectomy patients), and recommendation by another person (15% of onychectomy and 78% of tendonectomy patients).
- 13 (33%) of the onychectomy (6 house soiling, 2 refusing to cover feces, and 7 biting) and 3 (17%) of the tendonectomy (2 house soiling, 1 biting) patients developed behavioral problems following surgery. Statistical differences were not observed between the two surgical procedure groups.
- Benefits of surgery as reported by owners included a decreased perceived risk of injury to humans (77% of onychectomy and 28% of tendonectomy patients) and a better relationship between the cat and other animals (46% of onychectomy and 11% of tendonectomy patients). Significant differences were not detected in owner perceptions between the 2 surgical groups regarding the benefits of decreased damage to household materials, better relationships between owner and pet, or the need for less discipline of the cat following either procedure.

- 80% of onychectomy and 61% of tendonectomy patients had more than 1 immediate medical complication following surgery. 1 cat who was declawed had regrowth of P3. 1 cat who had tendonectomy had prolonged lameness (not further described in the text).
- Most owners perceived a return to normalcy for their cats within 14 days after surgery. 10% of onychectomy patients took more than 14 days to fully recover, as reported by their owners.
- 94% of tendonectomy and 87% of onychectomy patients' owners reported a positive attitude toward the surgery.

Jankowski, A., Brown, D., Duval, J., Gregor, T., Strine, L., Ksiazek, L., Ott, A. Comparison of effects of elective tenectomy or onychectomy in cats. JAVMA 1998; 213:370-373.

- This study prospectively compared the complication rates and owner satisfaction for onychectomized and tenectomized cats. It included 38 healthy cats.
- Bilateral forelimb onychectomy and tenectomy of the tendon of the deep digital flexor muscle are commonly performed on cats in the United States to prevent use of claws.
- Postoperative complications include pain, lameness, bleeding, swelling, incisional dehiscence, nerve trauma secondary to use of a tourniquet, and tissue necrosis resulting from improper bandaging. These complications develop in up to 50% of onychectomized cats.
- Long term complications include lameness, infection, regrowth of claws, development of chronic draining tracts from remnants of the distal phalanx, protrusion of the second phalanx, and development of palmargrade stance. These complications develop in up to 20% of onychectomized cats.
- Cats were examined by clinicians until discharge the day following surgery, then re-checked within 14 days post-operatively to assess short-term complications. Clients were contacted by telephone survey at least 5 months after surgery to assess long-term complications.
- The short-term complication rate in this study was 24%. Complications included hemorrhage, infection, persistence of sutures causing lameness, and behavioral changes.
- Long-term complications in this study included chronic lameness. No claw regrowth occurred in any of the cats.
- 2 of 18 owners whose cats underwent onychectomy were dissatisfied with the results. One cat had signs of extreme pain and inappropriate urination for 2 days after discharge. The other cat had long-term lameness and did not walk normally for 300 days after surgery. 6 of 20 owners whose cats underwent tenectomy were dissatisfied with the results. Dissatisfaction was related to ability to scratch somewhat after surgery (11 of 20), owner difficulty with trimming claws (6 of 20), excessively thick claws on the forelimbs that seemed to irritate cats, or long-term lameness (1 cat did not walk normally for 180 days after surgery). Two cats in the tenectomy group were disqualified from the study because their owners later admitted the cats for onychectomy due to dissatisfaction with tenectomy results.
- Cats who underwent tenectomy appeared to have significantly less pain than cats who underwent onychectomy.

Patronek, G., Glickman, L., Beck, A., McCabe, G., Ecker, C. Risk factors for relinquishment of cats to an animal shelter. JAVMA 1996; 209:482-588.

- This study examined the role of various risk factors for relinquishment of cats to an animal shelter. The study was conducted via telephone survey and included 624 cat-owning households and 218 households that relinquished a cat to the Humane Society of St. Joseph County during the study period.
- Euthanasia of healthy but unwanted pets by animal shelters is believed to be the leading cause of death in cats, claiming approximately 4 million lives annually.

- Increased risk factors for relinquishment included being declawed, having behavioral problems, households with a specific expectation about the cat's role in the household, inappropriate care expectations, owners who had never read a book about feline behavior, age < 6 months, being sexually intact, being a mixed-breed, being acquired at no cost from the previous owner, spending most of the day in a basement or garage, having access to the outdoors, never receiving veterinary care, owners who did not carry or display a picture of the cat, owners who had not previously owned a cat since childhood, annual family income < \$40,000, renting or living in an apartment or mobile home, and owners who lived in their current home for < 5 years.
- Cats that were found as strays, cared for by the entire family, viewed as family members, or unexpectedly acquired had a decreased risk of relinquishment.
- There was no statistical difference in incidence of behavioral problems between declawed and non-declawed cats.

Tobias, K. Feline onychectomy at a teaching institution: a retrospective study of 163 cases. Vet Surg 1994; 23:274-280.

- This study assessed the frequency of complications with onychectomy and any correlations with patient age, weight, or surgical technique. It studied 163 healthy cats who underwent onychectomy at a teaching hospital over a period of 7 years.
- At least one early complication was noted in 50% of patients. Early complications included pain, hemorrhage, swelling, lameness, and non-weight-bearing. Early complications occurred more frequently in patients who underwent scalpel vs Rescoe declaw.
- Late complications were noted in 19.8% of patients. Late complications included infection, regrowth of claws, P2 protrusion, palmargrade stance, and lameness. Late complications occurred more frequently in patients who underwent Rescoe vs scalpel declaw.

Martinez, S., Hauptman, J., Walshaw, R. Comparing two techniques for onychectomy in cats and two adhesives for wound closure. Veterinary Medicine 1993; 88:516-525.

- This study compared wound healing using disarticulation amputation via scalpel or bony amputation with Resco nail trimmers and two brands of surgical glue for closure. The study included 252 healthy cats. Cats were discharged the day after surgery and returned for re-check 7 days and 6 months after surgery.
- Complications associated with onychectomy include claw regrowth, chronic draining tracts, hemorrhage, and radial nerve paralysis.
- At the 1 week re-check, 11% of patients were lame (16% of scalpel and 5% of Resco declaws), 17% had dehiscence (22% of scalpel and 12% of Resco declaws). No differences were observed between tissue glue groups.
- At the 6 month re-check, 10% of patients had claw regrowth. These patients had all been in the Resco nail trimmer group.
- At both re-check visits, P3 remnants were noted in patients. The number of patients affected was not discussed. No clinical complications associated with these remnants were observed.