Burton-Hall K, HSOA J Altern Complement Integr Med 2026, 12: 686
DOI: 10.24966/ACIM-7562/100686

HSOA Journal of
Alternative, Complementary & Integrative Medicine

Review Article

Integration of Electroacupuncture as Part of a Pain Management Protocol during Surgical Dental Extractions in Dogs-A Pilot Study

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The goal of the study, "Integration of Electroacupuncture as Part of a Pain Management Protocol During Surgical Dental Extractions in Dogs-A Pilot Study," was to determine the efficacy of adding electroacupuncture (EAP) into a multimodal pain management protocol during surgical dental extractions in dogs. 30 dogs undergoing surgical dental extractions took part in the study -15 were randomly assigned to the Test Group (EAP) and 15 were assigned to the Control (non-relevant-EAP) Group. A cumulative pain score based on the Modified Glasgow Composite Pain Scale (mGCPS), consisting of assessments on four behaviors (vocalization, response to touch, demeanor, and posture/activity was collected at.0.5, 1, 2, 4, and 24 hours after extubation and was used for comparison of treatment effects between the two treatment Groups. Heart rate (HR) Respiratory Rate (RR) and body temperature (BT) were also collected at all times but 24 hours post-extubation [1].

All subjects underwent standard anesthetic procedure before receiving EAP or non-relevant-EAP. Test Group had needles placed bilaterally at Tai-yang, LI-4, ST-42 and ST-6 with the electrical stimulation performed at 80 Hertz for 10 minutes followed by 120 Hertz for 10 minutes prior to the start of the extractions. The needles the Control Group had placed bilaterally at BL-20, LIV-13, GB-34, and KID-3, with the same electrical stimulation settings. The acupuncture points chosen for the treatment group were a combination of both local and distal points. LI4 was a distal point and stimulation of the distal points cause the release of endorphins. LI4 is also very important point in clearing stagnation and the master point of the head/face. Pain and stagnation go hand in hand. Gupta et.al. in their paper on acupuncture as an adjunct to oral care, states that LI4 is an "excellent point for pain in the face and teeth."12 ST42 was the other distal point. ST42 was chosen as the second distal point as it is a useful point for dental issues and facial swelling. Swelling often accompanies any surgical procedure. Tai-yang and ST6 were chosen as the local points as they are both useful for dental pain. Grupa et.al. also mentions ST6 as useful point for dental pain.12 The control points were chosen primarily for the ease of placement in a patient in ventral-dorsal recumbency and to provide similar effects on the channels. LIV13 was chosen as a balance to Tai-yang as they are both crossing points of several meridians. The EAP was done for 10 minutes at 20 Hz and then 10 minutes as 80/120 Hz. The frequency of 20 Hz stimulates beta-endorphin release, and the higher frequency stimulates the release of serotonin [2,3].

The study showed a significant "Group" effect ($p = 0.001$) on the overall mGCPS score, supporting the hypothesis. Based on the assessments on post-extubation pain score (mGCPS), the study found that EAP had a significant effect ($p = 0.001$) on the overall mGCPS score during the 24 hours (5 assessment time points) after the extubation, and the mGCPS scores in patients receiving EAP were better (smaller) than Control Groups' scores in all 5 post-extubation assessments, with statistical significance (i.e., $p < 0.05$) concluded at 0.5-hr, 1-hr, 4-hr, and 24-hr assessments, respectively. The EAP-treated Group had a sixty percent lower pain score than the Control Group at 24 hours post-operatively. This was the time period in which the owners were assessing the pain scores as the pets were at home, so this information has a higher degree of variability than the other pain scores. There was also a significant difference at 24-hour post-operative time for the response to touch, demeanor and posture/activity parameters. The vocalization and response to touch are especially important parameters 24 hours post operatively as owners do not want to have a pet at home that is crying/whining or one that gets upset when they touch it.

The EAP Group also had significantly lower post-extubation HR than the Control Group ($p = 0.002$). The Group difference was not significant in post-extubation RR ($p = 0.336$) or BT ($p = 0.299$), although consistently over time the Test Group showed lower RR Group mean and higher BT Group mean. With the physiologic parameters, a statistically significant difference was only found between the two Groups in the HR parameter. This difference existed at all 4 times. As HR is often elevated in painful patients, it is encouraging that the EAP-treated patients had a statistically significant lower HR than the Control Group. A difference in the RR rate was not found, even though pain can also cause an increased RR. This may be due to the effects of the anesthesia. Patients can metabolize and recover from the same anesthetic protocol differently. A difference is BT between the two Groups would not be expected and was not found.

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Citation: Burton-Hall K (2026) Integration of Electroacupuncture as Part of a Pain Management Protocol during Surgical Dental Extractions in Dogs-A Pilot Study. HSOA J Altern Complement Integr Med 12: 686.

Received: February 24, 2026; **Accepted:** March 10, 2026; **Published:** March 17, 2026

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No similar experiments have been done in veterinary medicine. This study provided useful information and suggested that EAP should be considered as part of the pain Control regiment for canine dental extractions, but given the limitations of the study further investigations are needed. There was a significant reduction in the pain score at all times except the 2 hour post extubation.

Dental extractions are one of the most common procedures done in small animal veterinary clinics. Current standards of care for pain management includes local blocks, Non-steroidal Anti-inflammatory pain medications and opioids. These medications all have side effects and/or contraindications. Adding acupuncture can benefit the patient for several reasons. First EAP has few if any side effects and few contraindications, a few examples of contraindications being a known history of seizures, neoplasia and around the abdomen of a pregnant animal. Non-steroidal anti-inflammatory drugs must be used with caution in animals with underlying liver or kidney dysfuction. Dental extractions are often done in older animals which are more likely to have underlying organ dysfuction. The effect of NSAID on the kidneys can be especially harmful when the blood pressure is low – as commonly happens during anesthesia. In the Wun et al., article published in veterinary anesthesia and analgesia in 2025, they note that that pharmacovigilance data suggest adverse events with NSAIDs may occur more commonly than we think stating that from 2004 to the time of the articles writing over 700 instances of meloxicam induced renal insufficiency in dogs have been reported to European Medicines Agency (EMA.) [4]. Other studies appear to find that there is no change in the glomerular filtration rate renal or liver values between young healthy animals administered nonsteroidal anti-inflammatories and saline prior to anesthesia. These studies include: Cardell et. al. that was published in the American Journal of Veterinary Research in 2024, which looked at the effects of meloxicam and carprofen on renal function and found no difference [5]. Hernández-Avalos et al., found similar results in their study in 2020 when they looked at the effects of paracetamol, meloxicam, and carprofen in dogs undergoing ovariohysterectomy [6]. The important thing to note for both of these studies is that they were done on young healthy dogs. Many times, the dental extractions are being done on a more geriatric population that may already have pre-existing mild to moderate to moderate elevations and liver and kidney values. While this study had limitations such as the small sample size, there are few contraindications to acupuncture and incorporating it into the pre-anesthetic pain management protocol can be beneficial to patients.

Conflicts of Interest

The author has no conflicts of interest associated with the writing or research for this publication. No financial support was received from grants or third-party sources.

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