

# **In vivo evaluation of a dental anesthetic hydrogel dressing in post-extraction sockets**

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## **Abstract**

A novel dental anesthetic hydrogel (DAH) dressing can absorb water then slowly release lidocaine, an anesthetic agent, to relieve the pain after an extraction or a dry socket. The purpose of this in vivo study was to evaluate the DAH's release pharmacokinetics of lidocaine, and histological wound healing in post-extraction sockets. Adult beagles were used as the animal model. To establish the lidocaine release profile, DAHs were first placed in extraction sockets, then removed at various time intervals of 10, 30, 60, 90, 120, 150, or 180 minutes. The residual lidocaine in the DAH was analyzed and calculated at each time interval. To examine the healing process of the extraction site, 3 incisors in each arch were selected for extraction in 5 beagles. Post-extraction sockets were randomized for each treatment modality: extraction site without dressing control group, Spongostan(superscript ®) dressing control group, and DAH dressing experimental group. The above animals were sacrificed later at the time interval of 2 days, and 1, 2, 4, and 12 weeks for further histological evaluations. The results showed that lidocaine in DAH began to be released within 10 minutes, and up to 40%~50% had been released at 2~3 hours. DAH was degraded within 2 weeks; the biocompatibility of residual DAH was quite good with no adverse reaction noted in histological tissue sections. The wound healing of sockets treated with the DAH or Spongostan(superscript ®) dressing was slightly delayed for up to 2 and 4 weeks, respectively, but no significant differences were observed at 12 weeks within the 3 groups.