

FPIN's Help Desk Answers

Primary Closure of Animal Bites

Angela Cade, MD; Sarah Low, MD; and Hayden Head, MD

University of Texas Health Northeast, Tyler, Texas

Clinical Question

Is there a role for primary closure in animal bites?

Evidence-Based Answer

Dog bites can have a primary closure at the time of injury. (Strength of Recommendation [SOR]: A, based on a meta-analysis of randomized controlled trials [RCTs].) Primary closure of dog bites does not increase the rate of wound infections compared with nonclosure. Primary closure of mammalian bites (e.g., dogs, cats, humans) is associated with low infection rates, and more than two-thirds will have optimal cosmetic results. (SOR: C, based on a case series.)

Evidence Summary

A 2014 meta-analysis of patients with dog bites assessed the rate of infection for primary closure compared with nonclosure (four RCTs, N = 998).¹ Patients ranged from one to 83 years of age. One trial investigated only facial bites; no other trials mentioned the bite location. Time from bite to initial presentation was not discussed. Wound cleansing and debridement varied among the studies. Almost all trials explicitly noted saline irrigation, and most included application of various antiseptics. All closures were done with nonabsorbable sutures; one trial specified simple interrupted closure. Pooled data from all four trials showed no apparent difference in infection rates between primary closure and nonclosure (7.0% vs. 7.6%; relative risk = 0.93; 95% confidence interval, 0.6 to 1.4). The study was limited by inclusion of only dog bites, which may have lower rates of infection compared with bites from other mammals; unknown time from bite to closure; and lack of definition for infection.

A 2000 prospective case series of patients with dog, cat, or human bites who were evaluated in the emergency

department evaluated infection risk associated with primary closure of wounds (n = 145).² Patients ranged from 0 to 93 years of age. More men (58%) than women were included, and patients were predominantly white (86%). All patients presented within seven hours of the bite. Wound management techniques were not standardized and included high-pressure irrigation, local scrubbing, and/or surgical debridement. Deep-layer closure was required in 16% of patients. Oral antibiotics were administered to 81% of patients during initial treatment; these patients were more likely than those not receiving antibiotics to undergo high-pressure irrigation (91% vs. 70%; $P = .01$) and to have a bite on the upper extremity (41% vs. 12%; $P = .02$). Infection was defined as the presence of stitch abscess, localized cellulitis greater than 1 cm, purulent drainage, or diagnosis of infection requiring antibiotics. The incidence of infection at the time of suture removal was 5.5% (95% confidence interval, 1.8% to 9.2%). Cosmetic outcomes were not uniformly measured throughout the study. Most wounds that received primary closure (69%) achieved optimal cosmetic outcome based on a nonvalidated, author-derived, six-point scale that included presence or absence of step-off at the borders, contour irregularities, wound margin separation, wound distortion, and overall appearance.

Copyright © Family Physicians Inquiries Network. Used with permission.

Address correspondence to Angela Cade, MD, at angela.cade@uthct.edu. Reprints are not available from the authors.

References

1. Cheng HT, Hsu YC, Wu CI. Does primary closure for dog bite wounds increase the incidence of wound infection? A meta-analysis of randomized controlled trials. *J Plast Reconstr Aesthet Med.* 2014;67(10):1448-1450.
2. Chen E, Hornig S, Shepherd SM, Hollander JE. Primary closure of mammalian bites. *Acad Emerg Med.* 2000;7(2):157-161. ■

Help Desk Answers provides answers to questions submitted by practicing family physicians to the Family Physicians Inquiries Network (FPIN). Members of the network select questions based on their relevance to family medicine. Answers are drawn from an approved set of evidence-based resources and undergo peer review. The strength of recommendations and the level of evidence for individual studies are rated using criteria developed by the Evidence-Based Medicine Working Group (<http://www.cebm.net>).

The complete database of evidence-based questions and answers is copyrighted by FPIN. If interested in submitting questions or writing answers for this series, go to <https://www.fpin.org> or e-mail: questions@fpin.org.

This series is coordinated by John E. Delzell Jr., MD, MSPH, Associate Medical Editor.

A collection of FPIN's Help Desk Answers published in *AFP* is available at <https://www.aafp.org/afp/hda>.

Author disclosure: No relevant financial affiliations.