Letters to the Editor

The “Knot Method” of Tick Removal

To the Editor:

Prompt and complete tick removal is vital in areas where paralysis-causing ticks are found. Over 40 species have been implicated in causing paralysis, including *Dermacentor andersoni* in the United States and the Australian paralysis or scrub tick (*Ixodes holocyclus*). The Australian paralysis tick does not produce a cement substance but is a deep feeder and is generally difficult to remove, similar to Lone Star ticks (*Amblyomma americanum*). The problem of tick paralysis is in addition to other complications common to tick bites such as transmission of zoonoses, allergy, secondary infection, and foreign body inflammatory reactions. Salivary secretions from this Australian species contain holocyclotoxins that cause symmetric, flaccid, ascending paralysis, probably by in-

hibiting presynaptic neurotransmitter release.¹ At least 20 deaths have been reported in Australia from tick paralysis.¹ Although effective antitoxin is available, a few days must pass before sufficient salivary toxin is produced by the engorging female to cause paralysis.

Various methods have been described for the removal of ticks, each with its own problems, efficacy, and requirement for instruments or equipment. Some methods can be dangerous and potentially environmentally damaging and may lack efficacy (such as burning, dousing with petrochemicals, or suffocation).² Other methods require instruments or commercial tools that add to the weight to be carried in the wilderness.³ We wish to describe a method we have used over many years with success, which can be used in the wilderness with readily available equipment.

A simple open overhand knot is placed in suitable thread. Suture material such as 1/0 or 0 silk, dental floss,

Knot method of tick removal using dental floss.

or any thick cotton thread (including unwanted stitching from garments, if nothing else can be found) can be used (Figure). The open knot is placed over the tick as close as possible to the skin surface and then gently closed to form a loop around the parasite. Firm traction, lifting the body of the tick over its head in a somersault-type fashion then removes the tick. The Figure demonstrates the knot around a removed tick using dental floss. This method is effective, as the thread naturally inserts between the tick podosoma and gnathosoma and allows the removal of the entire tick, including mouth parts, without damage. This technique is simple, effective, safe for the patient, tick, and environment, and generally requires no additional equipment to be specifically carried for this purpose. We suggest the use of the "knot method" as an alternative to fine forceps or commercially available

tools for prompt tick removal in the wilderness to prevent complications from the bite.

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