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Brown Tree Snake (*Boiga irregularis*) Bites

The Brown Tree Snake (*Boiga irregularis*) is a colubrid snake native to Australia, New Guinea and the Solomon Islands, and inadvertently introduced to Guam around the time of World War II. Unique features of this species are: 1) The posteriormost teeth on each maxilla are enlarged and curved posteriorly with grooves on the anterior surface; 2) the reputation for attacking humans while sleeping (the Krait is the only other snake known to do this); 3) lack of a fang apparatus.

The venom sack is not delivered through fangs like other venomous snakes, including vipers; rather, the posterior teeth are connected to Duvernoy's glands. This is clinically relevant because *Boiga irregularis* cannot generate significant pressure during a single strike to release a harmful amount of venom. Significant envenomation appears to require constant "chewing" on the victim, though the exact amount of time required to produce toxicity is unknown, and will vary depending on both victim and snake size. About half of the venom transferred to the victim will likely remain in the skin.

The venom is a complex mixture of proteins, with metalloprotease and acetylcholinesterase the only two enzyme components. The brown tree snake does not lose its predatory abilities if deprived of this venom, suggesting that its main mechanism of predation is constriction with the "venom" serving a digestive role. Perhaps this is why victims, particularly infants, are often found with the snake's mouth clamped onto an extremity, with the body of the snake wrapped around the neck of the victim. Animal studies and human clinical observations suggest that systemic intoxication results in neurotoxicity.

Bites are common in Guam. Estimated frequency is one per 1,200 ED visits. Between 1987 and 2004, 446 cases were identified, and 20% occurred in persons less than one year of age. Bites in June to November are twice as common as December to May. Signs and symptoms following bites have included: bleb formation, local swelling with proximal limb progression, nausea, vomiting, tachypnea, ptosis, bradycardia or tachycardia, altered mental status, muscle or generalized weakness, spastic movements and respiratory arrest. Systemic toxicity has only been previously reported in infants less than one year of age. No deaths have been reported.

Recommendations

1. Adult victims with a clear story of a single strike need only generalized wound care and tetanus prophylaxis.
2. All children under two years of age should be monitored for at least 12 hours even in the absence of symptoms upon arrival.
3. Children over two who present without signs of systemic toxicity or adults who present without a clear story of a single strike should be evaluated on a case by case basis. These individuals are unlikely, however, to develop serious systemic toxicity.
4. There is no antidote available.
5. Recovery for severely poisoned children is usually within one to two days, but may be up to four days in some cases.