

same specimen observed over time. This may very well account for the variability of signs and symptoms in pit viper envenomation.<sup>51</sup>

Wingert contributes that:

The venoms are the product of modified salivary glands which are triangular shaped and located toward the outer edge of the upper jaw. Muscles that are innervated separately from the biting mechanism contract to discharge the venom. As a result, the snake can control the amount of venom to be injected. The snake may discharge venom from either or both glands but rarely ejects the full contents at a single bite.<sup>40</sup>

The venom of the pit vipers produces degradation of blood vessel walls (which affects vessels' resistance and permeability), changes in blood cells and the blood coagulation cascade, and direct or indirect changes that affect the heart, lung, kidneys, and the nervous system. According to Wingert large amounts of venom can result in...

an immediate profound fall in systemic arterial pressure and a decrease in circulating blood volume believed due to pooling of blood in the major vessels and capillary beds in the lung. Hypovolemic shock and pulmonary edema appear to cause most fatalities. Hemoglobin decreases and bleeding occurs throughout the body, often as soon as 6 hours after envenomation.<sup>37</sup>

Pit viper envenomation can rise to the level of a complex poisoning, affecting every organ system, resulting in coagulopathy, hemoconcentration (early) followed by a decrease in erythrocytes (anemia), thrombocytopenia, hematuria, proteinuria, hematemesis, melena, hemoptysis, epistaxis, and hypotension.<sup>19</sup> Bradykinin releasing activity present contributes to the severe pain and {short of a shock state} may cause pronounced but transient hypotension<sup>15</sup>. Difficulty in swallowing, blurred vision, and marked thirst may occur, and the patient may feel marked weakness after eastern and western diamondback envenomations.<sup>12</sup> The patient may feel faint, nauseated, and may have numbness or tingling around the mouth, tongue, scalp, fingers, toes, or site of the bite.<sup>19</sup> {Such paresthesias indicate that a significant envenomation exists}. Fasciculations are very common in human victims and when present after a bite by an unidentified snake should suggest the eastern diamondback, the Mojave or the southern Pacific rattlesnake as the offending reptile. Fasciculations in severe cases may become generalized, especially with eastern diamondback rattlesnake.<sup>15</sup> Transient myosis is said to be a symptom of severe envenomation due to the bite of the eastern diamondback rattlesnake.<sup>15</sup> Convulsions are said to be particularly common in children.<sup>12</sup> Prolongation of bleeding and clotting times may occur.<sup>19</sup> In addition to visible tissue destruction (including blebs, sloughing and gangrene), changes in capillary permeability may occur and blood vessel walls may be dissolved, which can lead to great fluid loss, pulmonary edema, swelling of entire limbs and more, and hypovolemic shock (a frequent cause of death). Anaphylaxis is an unlikely but possible result of snakebite, and should be considered in the overall assessment of the patient.

Local tissue is the body's first line of defense, sacrificing to neutralize the venom to a greater or lesser degree. Depending on venom load, swelling can be very impressive, extending over a day or so in spite of what is thought to be reasonable doses of antivenom. This makes sense when one thinks of poor