

Certain flies are attracted to blood and pus, laying their eggs on open or draining sores. Newly hatched larvae enter wounds or diseased skin. Larvae of several types of green bottle flies (*Lucilia/Phaenicia* species) usually remain superficial and confined to necrotic tissue. Specially raised, sterile “surgical maggots” are sometimes used intentionally for wound debridement. Larvae of screwworm flies, *Cochliomyia*, and the flesh fly invade viable tissues more deeply and produce large suppurating lesions. Larvae that infest wounds also may enter body cavities such as the mouth, nose, ears, sinuses, anus, vagina, and lower urinary tract, particularly in unconscious or otherwise debilitated patients. The consequences range from harmless colonization to destruction of the nose, meningitis, and deafness. Treatment involves removal of maggots and debridement of tissue.

The maggots responsible for furuncular and wound myiasis also may cause ophthalmomyiasis. Sequelae include nodules in the eyelid, retinal detachment, and destruction of the globe. Most instances in which maggots are found in human feces result from deposition of eggs or larvae by flies on recently passed stools, not from an intestinal maggot infestation.

PENTASTOMIASIS

Pentastomids (tongue worms) inhabit the respiratory passages of reptiles and carnivorous mammals. Human infestation by *Linguatula serrata* is common in the Middle East and results from the consumption of encysted larval stages in raw liver or lymph nodes of sheep and goats, which are true intermediate hosts for the tongue worms. Larvae migrate to the nasopharynx and produce an acute self-limiting syndrome—known as *halzoun* or *marrara*—characterized by pain and itching of the throat and ears, coughing, hoarseness, dysphagia, and dyspnea. Severe edema may cause obstruction that requires tracheostomy. In addition, ocular invasion has been described. Diagnostic larvae measuring ≤ 10 mm in length appear in copious nasal discharge or vomitus. Individuals become infected with another type of tongue worm, *Armillifer armillatus*, by consuming its eggs in contaminated food or drink or after handling the definitive host, the African python. Larvae encyst in various organs but rarely cause symptoms. Cysts may require surgical removal as they enlarge during molting, but they usually are encountered as an incidental finding at autopsy. Parasite-induced lesions may be misinterpreted as a malignancy, with the correct diagnosis confirmed histopathologically. Cutaneous larva migrans-type syndromes of other pentastomes have been reported from Southeast Asia and Central America.

LEECH INFESTATIONS

Medically important leeches are annelid worms that attach to their hosts with chitinous cutting jaws and draw blood through muscular suckers. The medicinal leech (*Hirudo medicinalis*) is still used occasionally for medical purposes to reduce venous congestion in surgical flaps or replanted body parts. This practice has been complicated by intractable bleeding, wound infections, myonecrosis, and sepsis due to *Aeromonas hydrophila*, which colonizes the gullets of commercially available leeches.

Ubiquitous aquatic leeches that parasitize fish, frogs, and turtles readily attach to the skin of human beings and avidly suck blood. More notorious are arboreal land leeches that live among moist vegetation of tropical rain forests. Attachment is usually painless, and the leeches will detach themselves when satiated with a blood meal. Hirudin, a powerful anticoagulant secreted by the leech, causes continued bleeding after the leech has detached. Healing of a leech-bite wound is slow, and bacterial infections are not uncommon. Several kinds of aquatic leeches in Africa, Asia, and southern Europe can enter the mouth, nose, and genitourinary tract and attach to mucosal surfaces at sites as deep as the esophagus and trachea. Externally attached leeches generally drop off after they have engorged, but removal is hastened by gentle scraping aside of the anterior and posterior suckers the leech uses for attachment and feeding. Some authorities dispute the wisdom of removing leeches with alcohol, salt, vinegar, insect repellent, a flame or heated instrument, or applications of other noxious substances.

Internally attached leeches may detach on exposure to gargled saline or may be removed by forceps.

SPIDER BITES

Of the more than 30,000 recognized species of spiders, only ~ 100 defend themselves aggressively and have fangs sufficiently long to penetrate human skin. The venom that some spiders use to immobilize and digest their prey can cause necrosis of skin and systemic toxicity. Whereas the bites of most spiders are painful but not harmful, envenomations by recluse or fiddleback spiders (*Loxosceles* species) and widow spiders (*Latrodectus* species) may be life-threatening. Identification of the offending spider is important because specific treatments exist for bites of widow spiders and because injuries attributed to spiders are frequently due to other causes. Except in cases where the patient actually observes a spider immediately associated with the bite or fleeing from the site, lesions reported as spider-bite reactions are most often due to other injuries or to infections with bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA).

Recluse Spider Bites and Necrotic Arachnidism Brown recluse spiders live mainly in the south-central United States and have close relatives in Central and South America, Africa, and the Middle East. Bites by brown recluse spiders usually cause only minor injuries, with edema and erythema. Envenomation, however, occasionally causes severe necrosis of skin and subcutaneous tissue and more rarely causes systemic hemolysis. These spiders are not aggressive toward humans and will bite only if threatened or pressed against the skin. They hide under rocks and logs or in caves and animal burrows. They invade homes and seek dark and undisturbed hiding spots in closets, in folds of clothing, or under furniture and rubbish in storage rooms, garages, and attics. Despite their impressive abundance in some homes, these spiders rarely bite humans. Bites tend to occur while the victim is dressing and are sustained primarily on the hands, arms, neck, and lower abdomen.

Initially, the bite is painless or may produce a stinging sensation. Within the next few hours, the site becomes painful and pruritic, with central induration surrounded by a pale ischemic zone that itself is encircled by a zone of erythema. In most cases, the lesion resolves without treatment in just a few days. In severe cases, the erythema spreads, and the center of the lesion becomes hemorrhagic or necrotic with an overlying bulla. A black eschar forms and sloughs several weeks later, leaving an ulcer that eventually may create a depressed scar. Healing usually takes place in ≤ 6 months but may take as long as 3 years if adipose tissue is involved. Local complications include injury to nerves and secondary bacterial infection. Fever, chills, weakness, headache, nausea, vomiting, myalgia, arthralgia, maculopapular rash, and leukocytosis may develop ≤ 72 h after the bite. Reports of deaths attributed to bites of North American brown recluse spiders have not been verified.

TREATMENT RECLUSE SPIDER BITES

Initial management includes RICE (rest, ice, compression, elevation). Analgesics, antihistamines, antibiotics, and tetanus prophylaxis should be administered if indicated. Early debridement or surgical excision of the wound without closure delays healing. Routine use of antibiotics or dapsone is unnecessary. Patients should be monitored closely for signs of hemolysis, renal failure, and other systemic complications.

Widow Spider Bites The black widow spider, common in the southeastern United States, measures ≤ 1 cm in body length and 5 cm in leg span and is shiny black with a red hourglass marking on the ventral abdomen. Other dangerous *Latrodectus* species occur elsewhere in temperate and subtropical parts of the world. The bites of the female widow spiders are notorious for their potent neurotoxins.

Widow spiders spin their webs under stones, logs, plants, or rock piles and in dark spaces in barns, garages, and outhouses. Bites are most common in the summer and early autumn and occur when a web is disturbed or a spider is trapped or provoked. The initial bite