Maggots Clear Necrosis From Purpura Fulminans

BY SHERRY BOSCHERT

SAN FRANCISCO — Maggot debridement therapy helped clear necrotic tissue from purpura fulminans in a 9-month-old boy who was not responding to standard wound care, according to Dr. Xuan Nguyen.

Reports of maggot debridement therapy in children are scarce. This appears to be the first case of using the therapy in a child with purpura fulminans, Dr. Nguyen said at a meeting of the Society for Pediatric Dermatology.

Maggot debridement therapy—also called biosurgery—was used in the United States in the 1930s and 1940s and reintroduced into medical practice in the 1980s and 1990s. In 2004, the Food and Drug Administration approved the production and marketing of medical maggots for debridement of nonhealing necrotic skin and soft tissue wounds, pressure ulcers, venous stasis ulcers, neuropathic foot ulcers, and nonhealing traumatic or postsurgical wounds.

Although purpura fulminans is not a specific indication, it is a chronic wound infection that seems amenable to maggot debridement therapy, she said.

The previously healthy boy presented to the Phoenix Children's Hospital with mottled skin 24 hours after receiving immunizations. He developed *Staphylococcus aureus* septicemia that led to extensive purpura fulminans, a diffuse necrosis of the skin and subcutaneous tissue secondary to microvascular thrombosis from transient protein C deficiency. All four extremities and some other areas became necrotic.

Conventional wound management using Dakin's solution, Vaseline petroleum gauze dressing over the ecchymotic wounds, Kerlix wraps, and daily wound dressing changes was applied as some of the wounds and mummified regions started to demarcate. Wounds on the face healed relatively well, but the lower extremities of the patient, in particular, had trouble healing. One patella was exposed after the rotting lower leg slid off, said Dr. Nguyen, a pediatric dermatologist at the hospital.

The maggots ingest nothing but necrotic tissue, and 200 maggots can consume up to 15 g/day. Mouth hooks on their front ends make them remarkable eating machines.

Dr. Nguyen and her associates applied five rounds (lasting 4-5 days each) of maggot debridement therapy combined with adjunctive daily whirlpool baths to which bleach was added. After five rounds of maggot treatment, whirlpool baths were scheduled three times per week as maintenance.

Maggot therapy serves three functions: It debrides necrotic tissue, acts as an antimicrobial therapy, and stimulates wound healing. Maggots like a moist environment and are relatively contraindicated in dry wounds. "We try not to use them in open wounds of body cavities, because the maggots get lost" when it is time to remove them, she said.

The maggots, which are larvae of the greenbottle blowfly (*Lucilia sericata*), are applied when 1-2 mm in size and grow to 10 mm after 4-5 days, when they are removed from the wound. The maggots ingest nothing but necrotic tissue, and 200 maggots can consume up to 15 g/day. Mouth hooks on their front ends rake in decaying flesh, making them remarkable eating machines.

The maggots secrete proteolytic enzymes including collagenase, trypsinlike enzymes, and chymotrypsinlike enzymes that facilitate wound healing. Their activity disrupts tissue planes only minimally, and some of their secretions inhibit gram-positive and gram-negative bacteria.

Sterile maggots on gauze were tied over the boy's leg wounds and covered with a Kerlix wrap, netting, and a stocking to keep the maggots in the wound. The boy is healing after amputation of his hands and feet, maggot debridement therapy, and use of maintenance baths, Dr. Nguyen said.

Information about conflicts of interest could not be obtained by press time. ■