Maggots Clear Necrosis From Purpura Fulminans

BY SHERRY BOSCHER

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. Xuexia (John) 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 1986 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 post-surgical 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 gangrenous.

Conventional wound management using Dakin’s solution, Vaseline petroleum gauze dressing over the eecrhythmic 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 retacting lower leg slid off, said Dr. Nguyen, a pediatric dermatologist at the hospital.

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 major functions: It debrides necrotic tissue, acts as an antimicrobial therapy, and stimulates wound healing. Maggots like a moist environment and are relatively transtioning bacteria. “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 green bottle fly (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 neither necrotic tissue, and 200 maggots can consumne up to 15 g/day. Mouth hooks on their front ends make them remarkable eating machines.

The maggots secrete proteolytic enzymes including collagenase, trypsln,ie enzymes, and chymotrypsinlike enzymes that facilitate wound healing. Their activity disrupts tissue planes only minimally and 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 stockinette. Maggots were fed twice daily. Five rounds of therapy were given and two Regronplex immersions were given.

Wound healing after maggot debridement was remarkable. Healing was complete and no further therapy was needed. He resumed all activities with no sequelae.

Maggot debridement is a viable option for wounds that are resistant to conventional management. It is a safe option for use in immunocompromised children who may be at high risk for infectious complications.

Maggots are used for deep and extensive wounds in the treatment of chronic non-healing wounds. Maggots secrete trypsins, chymotrypsins, collagenses, nuclease and deoxyribonuclease to help in the healing process. In addition, they also produce other non-protein enzymes like collagenase, elastase and phospholipases. These enzymes help in the degradation of necrotic tissue and stimulate the wound healing process.

**Maggots**

- **Necrosis:** A condition of the skin characterized by destruction of the tissue.
- **Maggots:** Larvae of the housefly that are used in wound debridement.
- **Biosurgery:** A medical treatment involving the use of maggots to remove necrotic tissue.
- **Dakin’s solution:** A disinfectant solution used in wound care.

**References**


**Conclusion**

Maggot debridement therapy is a viable option for wounds that are resistant to conventional management. It is a safe option for use in immunocompromised children who may be at high risk for infectious complications.