The use of maggot therapy in paediatric surgery: a case report

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Key Points

1. Maggot therapy was used to cleanse an extensive post-traumatic amputation wound that had become infected and necrotic, not as a last resort, but because it was judged to be safer than extensive surgical debridement with the attendant risks of vessel injury, blood loss, postoperative bleeding and sepsis.

2. Although the application of maggots is normally not recommended close to large vessels and open body orifices, we observed no bleeding and no penetration of maggots into the bladder or rectum.

3. Our experiences suggest that maggot therapy may have a place as an alternative or adjunct to surgical debridement in other paediatric wounds.

Abstract

A post-traumatic amputation wound involving the loss of the left leg and left hemipelvis was successfully debrided using a combination of limited surgical debridement and larval therapy. Larval debridement of the wound took only three days, and was followed by uneventful skin grafting of the whole area. Maggot use in the treatment of an extensive wound surface, where classical surgical cleaning may pose a risk to major
vital organs, should be considered as a possible first-choice procedure rather than a last-resort remedy.

**Presentation**

An unsecured fastening strap on a passing lorry became entangled with a 10-year boy and pulled him under the wheels, causing almost complete traumatic amputation of his left leg and left hemipelvis (Figure 1).

![Figure 1](image1.png)

**Figure 1** - X-ray showing the extent of the traumatic amputation of the left leg and hemipelvis, and the partial dehiscence of the right sacro-iliac joint.

The skin was also stripped from his buttocks, perineum and lumbar regions, and his urethra was disrupted close to the bladder neck. Following thorough surgical debridement to remove dirt and fragments of his clothing, the area was loosely covered with a poorly vascularised pedicle skin flap from his amputated left leg and a transversostomy performed to keep the wound clean. The disrupted urethra could not be closed because of the displacement caused by the external rotation of the right lower limb and the pubic bone. After demarcation of the temporary skin flap and removal of the necrotic tissue from the lumbar area, the wound was treated with dressings soaked in normal saline or chlorhexidine gluconate (Hibitane) and daily baths with a potassium permanganate (KMnO₄) solution. On Day 4 the appearance of pus and odour indicated an overt wound infection. Initial microbiological examination revealed the presence of *Candida albicans*, later followed by *Enterococcus faecalis*, *Escherichia coli* and *Clostridium tetani*, all of which were adequately treated with systemic antibiotics. On Day 10 all the necrotic skin was surgically removed (Figure 2), but more extensive surgical debridement was avoided because of the risks involved, including vessel injury, blood loss, postoperative bleeding and sepsis.

![Figure 2](image2.png)

**Figure 2** - Extensive necrotic tissue and infection were present on Day 10.

Maggot therapy was initiated in an attempt to complete the debridement process and prepare the wound bed. Eight pots of maggots were applied as a single application to
the 600cm² wound and covered with a fine nylon mesh dressing and moist gauze (Figure 3).

Figure 3 - The maggot dressing in place. The bladder neck and anus are open, protected only with zinc paste.

When the maggots were removed after 72 hours, the clinical signs of infection had been eliminated and the wound bed was clean and beginning to granulate. At this point split-skin grafts were applied, which were almost entirely successful: only a small area around the bladder neck needed regrafting (Figure 4). The wound subsequently healed completely and the patient is awaiting the fitting of a prosthesis.

Figure 4 - Complete coverage of the wound. Visible anus and catheter in bladder.

Discussion

Historical reports document the benefits of opportunistic larval infestation on the healing of wounds sustained on the battlefield. Maggot therapy, which was popular in the early part of the 20th century, fell into disuse when antibiotics were developed in the 1940s. Recently, the development of resistant bacterial species has led to the commercial production of sterile maggots. Maggot therapy has been used in Europe and the USA in the treatment of many types of wound, including leg ulcers, pressure ulcers and diabetic ulcers [1] [2]. Despite widespread acceptance of maggots, their use in children has been limited. In 1929 Baer successfully treated three children with osteomyelitis, but our review of the literature has revealed no further reports of their use in paediatric wound care since that time [3]. The patient was treated with maggot therapy not as a last resort, but because it was judged to be safer than extensive surgical debridement with the attendant risks of vessel injury, blood loss, postoperative bleeding and sepsis. Although the application of maggots is not normally recommended close to large vessels and open body orifices, we observed no bleeding and no penetration of maggots into the bladder or rectum. This case study suggests that maggot therapy may have a place as an alternative or adjunct to surgical debridement in other paediatric wounds.
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References

