Larval therapy as a means of debridement

With the advent of online databases of medical literature, modern wound care specialists have at their disposal a vast body of knowledge to inform their clinical decision-making. From the massive quantity of published evidence, one can discern trends that have cemented a number of core tenets into the mind of every wound care practitioner: the importance of a moist wound healing environment to successful healing, the importance of dressing selection in effective exudate management throughout the course, of treatment and of course, the need to prepare the wound bed for optimal treatment and thus healing.

Debridement is an essential process of wound bed preparation (EWMA, 2004) and of total patient care; indeed it is often 'the first goal of wound care' (Fowler, 1995). Whilst sharp debridement has been touted as 'the gold standard' (Leaper, 2002), hi-tech variants such hydrosurgical and ultrasound debridement have taken wound bed preparation to the next level, in technological terms.

Larval debridement therapy is rather at odds with these advances. Indeed, it may seem counter-intuitive to employ a live creature with no means of direct control over its activity as a method of wound bed preparation, and use of maggots, has on occasion, been unpopular with both practitioners and patients (Wainright, 1988). However, according to Gray et al (2011), maggots work by secreting proteolytic enzymes to facilitate debridement, and imparting their own antimicrobial action while selecting only devitalised tissue. With the first mention of larval therapy having been traced to the Old Testament (Whitaker et al, 2007), it seems our ancestors recognised the benefits, and evidence of larval use within medicine has been found amongst aboriginal peoples in Australia and Central America (Gottrup, 2011).

According to Whitaker et al (2007), Ambroise Pare (1510–1590), the most prominent renaissance surgeon, was the first to employ maggots as a considered treatment for wounds, followed by Dominique Jean Larrey (1766–1842), who observed the debriding and wound healing benefits of larvae while on expedition in Syria: *'These larvae are, indeed, greedy only after putrefying substances, and never touch the parts which are endowed with life'* (p34, Larrey, 1832).

Once initial objections have been overcome, debridement by larval therapy is effective, rapid and highly selective (Leaper 2002; Gray et al, 2011)

Despite their inherent benefits, maggots as a debridement therapy were almost forgotten as the medical community embraced the work of Louis Pasteur and Robert Koch — introducing non-sterile maggots to a wound bed flew in the face of all that germ theory espoused. Their partial resurgence can arguably be attributed to US-based surgeon William Baer (1872–1931), who, having used them during WWI, utilised *Lucilia sericata* larvae in 1929 to successfully treat child osteomyelitis patients who had failed primary treatment during his tenure as Professor of Orthopaedics in Baltimore. However, mass production of penicillin was underway by 1944, along with the arrival of new antiseptics; larval therapy as a treatment for infected wounds was all but over.

Now known under the more patient-friendly pseudonym of 'biosurgery' or 'biotherapy', larval therapy has seen something of a renaissance, thanks in part to the problem of increasing bacterial resistance to antibiotics (Sherman, 1988). Moreover, modern-day clinicians have realised that once initial objections have been overcome, debridement by larval therapy is effective, rapid and highly selective (Leaper 2002; Gray et al, 2011). WUK

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