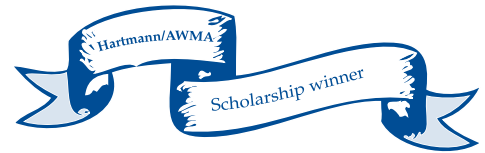


# Case study: maggot debridement therapy

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## Abstract

This case study looks at the use of maggot debridement therapy on a non-healing wound in a middle-aged lady.

## Introduction

Hazel [pseudonym] was a 60 year old single woman living independently with her cat for company. She demonstrated good mental health; however, physically, she had an extensive past medical history including type II diabetes mellitus, a total nephrectomy requiring haemodialysis and ischaemic heart disease (IHD) which resulted in a coronary artery bypass grafting (CABG) in 1995. She had peripheral vascular disease (PVD) with clear visual signs of venous disease such as haemosiderin deposits. Hazel's mobility was limited but she managed well with a tri-wheeler frame.

## Case report

In May 2007 Hazel suffered a minor trauma to her lower left leg whilst descending the steps of a bus. Initially there was no break in skin integrity but a large haematoma developed over the following 3 days. She did not seek medical advice nor attention at this time but chose to treat the injury herself. The area of original insult deteriorated slowly over a period of several weeks into a full thickness black necrotic wound. Hazel was seen at this time by her general practitioner and was immediately admitted to hospital for management. An intravenous line was inserted for a regime of antibiotics, pain was controlled with oral medication, the plastic surgery team was consulted and Hazel was rested in bed with bathroom privileges.

The wound required radical surgical debridement under a general anaesthetic. A topical negative pressure dressing was applied postoperatively and continued for several days, after which time it was decided that Hazel would require a split skin graft. Dialysis continued and her diabetes remained

stable throughout her admission. Other medications at the time included mixtard BD, calcitrol, caltrate, clopidogrel, domperidone, erythropoietin, atorvastatin, folic acid, isosorbide mononitrate, metoprolol and aspirin.

The application of a split skin graft under general anaesthetic was uneventful and Hazel recovered well. Over a period of 2 weeks, the graft had taken to 70% of the area. Three weeks later, Hazel was discharged home with ongoing wound management and dressings by the community nurses.

## Wound profile and treatment

Four weeks after discharge, Hazel was reviewed in the hospital's outpatient clinic by the plastic surgery team. The graft site was clearly infected. It was malodorous, highly exuding, and inflamed with significant oedema of the lower leg and a thick layer of slough covering the entire wound bed. It measured approx 20x7cm, with a depth of 7mm.

A lengthy discussion amongst the clinical team led to numerous ideas and approaches which included maggot debridement therapy (MDT). There was some difficulty within the healthcare team in agreeing upon this solution, although it was unanimous that further surgical debridement was not an option. Autolytic and biosurgical debridement were the preferred treatment options despite there being some doubt that MDT may disturb what viable graft tissue was left. However, it was agreed that Hazel would be re admitted and MDT applied to her wound.

Due to Hazel having a past history of IHD, CABGs and PVD, to have another general anaesthetic would have remarkably increased her intraoperative risks<sup>1</sup>. This was why biosurgical debridement therapy was considered and thought to be Hazel's best option. The objectives of the wound management team were therefore to control exudate, debride the slough, increase granulating tissue and epithelialisation, and ultimately attain wound closure.

In Tasmania, the maggot used for this treatment is not readily available and maggots used by the Royal Hobart Hospital are

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specially bred by the department of entomology at Westmead Hospital in Sydney. *Luciella sericata* is not endemic to Tasmania, therefore quarantine precautions have to be followed and a strict protocol is in place. When a patient is to have MDT, a phone call is made to a New South Wales company, the maggots are then incubated and grown to an adequate size in a sterile environment before they are exported via airplane to Tasmania. This takes up to 10 days from the phone call to application of MDT. The *L. sericata* required for this case were ordered and 72 hours later were applied according to the maggot application guidelines recommended by the clinical nurse consultant for wounds. Three days later, they were removed and incinerated following quarantine guidelines.

A moderate amount of graft was then visible (Figure 1). The majority of slough had been biosurgically debrided and the remaining viable graft was pink and healthy, with areas of epithelial tissue apparent.



Figure 1. The wound after MDT.

## Discussion

Biosurgical therapy is a debridement therapy using maggots to remove non-viable tissue from a wound<sup>2</sup>. Maggots feed only on devitalised tissue, therefore not harming/hindering vital or healthy tissue<sup>2</sup>. This was evident upon the removal of Hazel's first application of MDT as the epithelial tissue of the split skin graft was visualised. Photographs were taken before and after MDT and scanned into Hazel's patient file. A second application of MDT was applied; this exposed 80% of the graft tissue and MDT treatment was then ceased (Figure 2).

Wounds of any aetiology have been shown to be positively affected by biosurgical debridement<sup>3</sup>. This means that arterial/venous wounds, diabetic ulcers, pressure ulcers and infected wounds may benefit from MDT<sup>4</sup>. In Hazel's case, 80% of the graft had been uncovered by the MDT.

Obtaining patient consent for MDT treatment can be problematic for the practitioner, perhaps in part due to the common misconceptions held about the cleanliness of



Figure 2. Hazel's leg 2 months after discharge.

maggots by the general public; this is often described as the 'yuck' factor<sup>5</sup>. Additionally, in some ischaemic wounds, MDT may be felt as pain as these wounds are already hypersensitive and minute movements can increase this sensitivity<sup>6</sup>. Maggots may also be felt if they move onto the peri-wound area on healthy skin<sup>6</sup>. Hazel was reassured about MDT and her consent was easily obtained, therefore it was not a barrier at this time. Throughout the two applications of MDT, Hazel reported not to feel any discomfort whatsoever.

## Summary

Although Hazel encountered differing opinions in relation to the treatment of her wound, through discussion of options and a cohesive team approach, MDT was clearly a very good decision. Two applications of MDT were prescribed, all devitalised tissue was biosurgically removed, and the healthy graft underneath was exposed. MDT saved her leg from widespread infection and possibly amputation, and also reduced the risk from surgery and general anaesthetic. Hazel had many co-morbidities that contributed to a lengthy stay in hospital and, had MDT not been applied, Hazel may have lost her leg.

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