ISSN 2456-3110
Vol 5 · Issue 1
Jan-Feb 2020

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Charaka Publications

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
REVIEW ARTICLE Jan-Feb 2020

Maggot debridement therapy an Ayurvedic understanding

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ABSTRACT

Maggot debridement therapy also known as larva therapy, bio debridement or bio surgery, is practiced widely in Western countries. It manages to clean the wound by removing dead and infected tissue ('debridement'), disinfecting the wound (kill bacteria).[1] The available references say that this procedure was started during the late 1920s by William Bear, at Johns Hopkins University in Baltimore, Maryland. He first studied lifecycle of maggots, successfully treated the wounds and published a series of articles. And he recommended to rear and disinfect the maggots and he is the one to recommend application of specific species of blow flies. This method of Wound debridement has been explained in our classical treaties Sushruta Samhita by The Father of Indian surgery - Acharya Sushruta in the name of Krimi Utpattikara Chikitsa in the context of Arbuda.[2]

Key words: *Maggot debridement therapy, Krimi Utpattikara Chikitsa, Arbuda.*

INTRODUCTION

Any wound becomes a headache for the doctor to cure once it attains chronicity. Chronic wound causes the wound to have a continuous accumulation of necrotic and unhealthy tissue. And hence a chronic wound definitely needs debridement frequently in order to facilitate the natural wound healing process. Debridement also helps to reduce the bacteria in a chronic wound which in turn assists the wound to return to the normal healing process.[3]

There are various forms of wound debridement:

- Autolytic debridement
- Surgical/Sharp debridement
- Enzymatic debridement
- Mechanical debridement
- Larvae therapy debridement[3]

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Submission Date: 08/01/2020 Accepted Date: 15/02/2020

Access this article online

Quick Response Code

Website: www.jaims.in

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LARVAE DEBRIDEMENT THERAPY

Also known as maggot debridement therapy is a debridement method where the larvae of the *Lucilia sericata* fly are applied on the wound. The larvae ingest and breakdown dead tissue and also decrease the bacterial load on the wound.[3] The efficacy of larvae in debriding the wound was first observed and inculcated in early 1930s and soon in 1940s popularity of Maggot Debridement therapy was declined due to introduction of antibiotics and again in late 1980s it gained back its popularity due to increased incidences of pressure ulcers, leg ulcers, diabetic foot ulcers.[3]

Ayurveda in 1500BC has explained the method of debriding the unwanted materials through a procedure called Krimi Utpattikara Chikitsa.

Procedure as explained by Acharya Sushruta

While explaining treatment for Kapharbuda Acharya advices to apply Kalka of *Nishpava* (*Shimbi Dhanya* -

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Cyamopsis tetragnolobus, Vigna catjang, Dolichos lablab), *Pinyaka* (*Tilakitta*), *Kulattha* (*Dolichos biflorus*) mixed with *Mamsa*, *Dadhi* and *Mastu*. This application attracts the flies, and the flies produce *Krimi*. In turn these *Krimi* ingest the unhealthy part of *Arbuda* and thus cleaning the lesion.[2]

Procedure explained in contemporary system of medicine

Larvae therapy can be applied on the wound either in loose or bagged form. The loose method involves protecting the peri-wound with a hydrocolloid dressing or Sudocrem, applying the larvae, covering it with a mesh type dressing and securing it with tape. The wound can then be covered with a loose secondary dressing. Loose larvae applied to the wound is recommended at a dose of 10-15per^{2}cm and should be changed every 48-72 hours. The bagged form of larvae, also called a bio-bag, are applied directly on wound bed, having protected the peri-wound. A loose secondary dressing is then appliedover the wound.

In order to cause efficient debridement, it isimportant that there is sufficient exudate from the wound. The excess exudate from the wound is soaked into the loose secondary dressing. In some casesit may be possible to make a dry wound suitable for larval therapy by moistening it with saline soaks, applied for 48 hours. Dressings must be designed to prevent any maggot from escaping, while allowing air to get to the maggots. Dressings are also designed to minimize the uncomfortable tickling sensation that the maggots often cause.[4]

Discussion

Damp surfaces, compost, manure, decomposing organic material, old rotting food are the favorite habitat for the larvae. These rotting food/waste materials release methane gas which attracts flies.

In the same way a moist, exudating wound with sufficient oxygen supply is a prerequisite for maggot therapy. Wounds which are dry or open wounds of body cavities do not provide a good environment for the maggots to feed.

Mechanisms of action

There are 2 principles of action,

1. Debridement[5]
2. Disinfection of the wound[6]

Debridement

In maggot therapy a large number of maggots consume necrotic tissue far more precisely than is possible in a normal surgical operation, and can debride a wound in a day or two. They derive nutrients through a process known as 'extra-corporeal digestion' by secreting a broad spectrum of proteolytic enzymes[7] that liquefy necrotic tissue and absorb the semi liquid within a few days.

Further more, the p^H level of a wound increases with larvae therapy due to the antibacterial secretions, thus allowing the wound bed to become anenvironment that enhances the healing process due to the elimination of bacteria.

Disinfection

As early as 1957 a specific antibiotic factor was found in maggot secretions.[8] Secretions believed to have broad-spectrum antimicrobial activity include allatoin, urea, phenylacetic acid, phenyl acetaldehyde, calcium carbonate, proteolytic enzymes.[8] In vitro studies have shown that maggots inhibit and destroy a wide range of pathogenic bacteria including Methicillin Resistant Staphylococcus Aureus (MRSA), Group - A and B Streptococci and gram positive aerobic and anaerobic strains. Other bacteria like E. coli and Pseudomonas are not attacked by maggots.

Hence the main motto of Krmi Utpatthikara Chikitsa is to convert a Dushta Vrana into a Shuddha Vrana and thereby accelerating the speed of wound healing. Arbuda being a Chedya Sadhyavyadhi needs to be excised without leaving behind any reminent. Acharya Sushruta advices to go for *Shastra Karma* if the vaidya finds it necessary.[9] In this era where so many researches have been carried out proving *Krimi Utpatthi Chikitsa* to be one of the best choices in debriding an unhealthy wound, it is the best option to go for such therapy for effective wound management.

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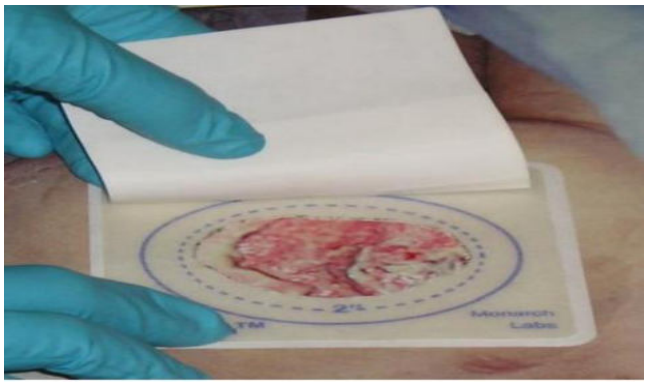
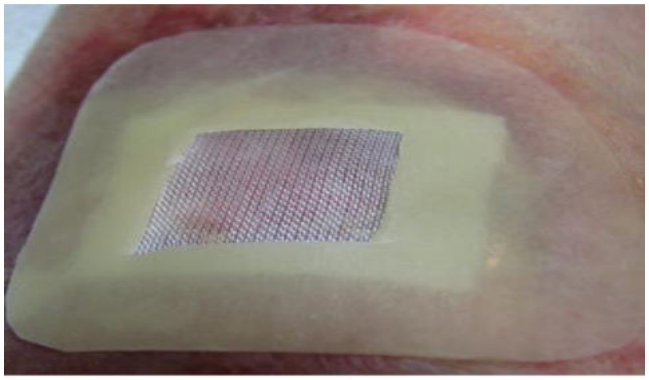
Loose form of larvae therapy



Loose form of larvae therapy



Mesh covering

Bio Bag

Granthi and *Arbuda* require complete debridement in order to avoid recurrence.[10] Since maggots burrow and debride the wound effectively and completely reducing the recurrent rate to a marked extent it is wise to opt this variety of therapy.

A normal healthy wound requires minimum of 12 weeks to develop epithelialization where as an unhealthy wound requires even more number of days for its cure. The ultimate time course and outcome will depend on the nature of the wound - its location, size, depth, and type. When other pathological factors come into play such as underlying disease, wound somehow deviates from natural physiologic course of events and stalls at same point. Hence effective wound debridement would be necessary to accelerate the wound healing process.

Though *Krimi Utpatthikara Chikitsa* is explained in our classics it has shown a marked decline in India due to lack of thorough knowledge and low acceptance among both the practitioners as well as patients and uneasiness they feel on having maggots on their body. But it has been widely practiced in the Western countries as a main stream of treatment in wound debridement due to negative impacts seen in the use of Antibiotics like systemic side effects (nausea, vomiting, diarrhea, abdominal pain, loss of appetite), allergic reactions like urticarial or hives, coughing, wheezing, tightness of throat and drug resistance. So there is need to educate and bring awareness among people about the benefits of *Krimi Utpatthikara Chikitsa* over other treatment modalities and to adopt it as a main stream of medicine.

Conclusion

For Maggot therapy - the debridement of necrotic tissue with the sterile fly larvae is fast, securing aplace in wound care. *Krimi Utpatthi Chikitsa* which is explained in our classics is an effective and safe treatment option for debridement and disinfection.

References

1. Sun, Xinjusn: jiang, Kechun; Chen, Jingan; (2014) ' A Systemic review of maggot debridement therapy for

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chronically infected wounds and ulcers'. International Journal of Infectious Diseases 25: 32-7.

2. Acharya Sushruta, Sushruta Samhita, chikitsa sthana, 19 Adhyaya, 37-38. Published by chauhamba Surabharati Pratishtana.
3. Máire O' Meara (2014) 'The Impact of Larvae Therapy on the Debridementof Chronic wounds: A Systematic Review'
4. Morgan, Rosemary (2002), 'Larval therapy' Student BMJ 10: 259-302.
5. Chan, Dominic CW; Fong, Daniel HF;(Oct 2007), 'Maggot debridement therapy in chronic wound care' Hong Kong Medical Journal 13.
6. Sherman, R.A .(2014), ' Mechanisms of maggot Induced Wound Healing: What do we Know and where do we Go from here?, Evidence based Complementary and alternative medicine 2014.
7. Reams, Mark K; Christensen, Chris; Luce, Edward A.(1988) ' The Use of Maggots in Wound Debridement' Annals of Plastic Surgery 21.
8. Pavillard, ER Wright, EA (1957), 'An Antibiotic from Maggots', Nature 180.
9. Acharya Sushruta, Sushruta Samhita, Sutrastana, Adhyaya 24, shloka 3.
10. Acharya Charaka, Charaka Samhita, Chikitsa Sthana, 12 Adhyaya, Shloka 83.

How to cite this article: Dr. Nagashree H. Krishna, Dr. Shilpa P.N., Dr. Chiranthkumar R. Maggot debridement therapy an Ayurvedic understanding. J Ayurveda Integr Med Sci 2020;1:118-121.

Source of Support: Nil, **Conflict of Interest:** None declared.

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