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## Efficacy of topical silver preparations for treating non-healing ulcers versus conventional dressing

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### Abstract

During the past three decades considerable knowledge has been gained regarding the patho-physiology and management of chronic leg ulcers. Despite all these, the management of chronic leg ulcers is still a fertile field for experimentation. Various studies have been conducted and a number of procedures and techniques have evolved with varying degrees of success. The study was estimated to include 50 patients who present with non-healing ulcers at hospital with purposive sampling technique. In group 1, 56% of patients were having slough on Day 0 and on Day 10 it was decreased to 24 %. That is, 32% decrease in slough. In Group1, 52% of patients were having serous discharge and it has been increased to 88 % on day 10. In group 2, 68% of people having slough on Day 0 and it was decreased to 52 % on day 10, that is 16% decrease in slough noted on day 10. In group 2, 44% of people were having serous discharge on Day 0 and it has been increased to 56% on day 10. That is 12 % increase in serous discharge over 10 days.

**Keywords:** topical silver preparations, non-healing ulcers, conventional dressing

### Introduction

Ulceration of the leg and foot is a frequent condition seen in most of the surgical wards and out-patient department. Ulcers can be described as wounds with a 'partial or full thickness depth' and a 'slow healing tendency'. In general, the slow healing tendency is not simply explained by depth and size, but caused by an underlying pathogenetic factor that needs to be removed to induce healing <sup>[1]</sup>. The main causes are chronic venous insufficiency, lower extremity arterial disease and diabetes. Less frequent conditions are trauma, blood dyscrasias, infections, skin malignancies, vasculitides and ulcerating skin diseases such as pyoderma gangrenosum. But even rare condition exists such as recently discovered combination of vasculitides and hypercoagulability <sup>[2]</sup>. For a proper treatment of patients with leg ulcers, it is important to be aware of the large differential diagnosis of leg ulcers. The best treatment of any leg ulcer depends upon the accurate diagnosis and the underlying etiology. A multidisciplinary approach is needed to treat this condition as it is reported to have impact on virtually every aspect of daily life: pain, disturbed sleep, mobility and work capacity tend to be restricted, and personal finances are often adversely affected <sup>[3, 4]</sup>.

During the past three decades considerable knowledge has been gained regarding the patho-physiology and management of chronic leg ulcers. Despite all these, the management of chronic leg ulcers is still a fertile field for experimentation. Various studies have been conducted and a number of procedures and techniques have evolved with varying degrees of success <sup>[5]</sup>. It is common to see patients with different types of ulcers due to various etiology and underlying systemic diseases. In this study different parameters of the healing of the chronic wounds like slough, granulation tissue formation and type of discharge in the wound is compare with the silver dressing and conventional betadine dressing <sup>[6]</sup>.

### Methodology

The study was estimated to include 50 patients who present with non-healing ulcers at hospital with purposive sampling technique.

- A complete detailed history and physical evaluation, relevant blood investigations, radiological investigations will be done.
- Age of the patient. Symptoms and their duration, Past history, Complete physical examination, Laboratory investigations (including specific investigations like Pus

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cultures will be done at regular intervals), Radiological investigations wherever necessary, Treatment given.

- Data was analysed by using following parameters- Discharge, granulation tissue formation, slough, microbiological evaluation on day0, day5, day10.

#### Inclusion criteria

All patients above 20 yrs who are diagnosed to have non-healing ulcers

#### Exclusion criteria

‘Patients receiving corticosteroids, immunosuppressive agents, radiation, or chemotherapy within one month prior to entry into study were excluded. Malignant ulcers and X-rays showing features if osteomyelitis.

#### Results

**Table 1:** Slough comparison

Slough	Day 0		Day 5		Day 10	
	Present	Absent	Present	Absent	Present	Absent
Group 1	14	11	9	16	6	19
Group 2	17	8	16	9	13	12

**Table 2:** Discharge comparison

Discharge	Day 0		Day 5		Day 10	
	Serous	Purulent	Serous	Purulent	Serous	Purulent
Group 1	13	12	16	9	22	3
Group 2	11	14	12	13	14	11

**Table 3:** Granulation tissue comparison

Granulation tissue	Day 0		Day 5		Day 10	
	Present	Absent	Present	Absent	Present	Absent
Group 1	10	15	17	8	20	5
Group 2	12	13	9	16	10	15

**Table 4:** Group 1 analysis

Group 1	Day 0	Day 10	Change
Slough	56%	24%	32% ↓
Serous discharge	52%	88%	36% ↑
Granulation tissue	40%	80%	40% ↑

**Table 5:** Group 2 analysis

Group 2	Day 0	Day 10	Change
Slough	68%	52%	16% ↓
Serous discharge	44%	56%	12% ↑
Granulation tissue	48%	48%	8% ↓

**Table 6:** Comparison of results

Groups	Group 1	Group 2
Slough	32% ↓	16% ↓
Serous discharge	36% ↑	12% ↑
Granulation tissue	40% ↑	8% ↓

The ulcers included in this study in both the groups had diverse etiologies but the Traumatic ulcers formed the major component of each group. Both groups had comparable age and sex distribution as seen in above depicted graphs.

Group 1 patients were subjected for silver dressing and group 2 patients were subjected for betadine dressing. In both the groups, wound examined on Day 0, Day 5 and Day 10 and parameters like slough, type of discharge and granulation tissue compared.

In group 1, 56% of patients were having slough on Day 0 and on Day 10 it was decreased to 24 %. That is, 32% decrease in slough. In Group1, 52% of patients were having serous discharge and it has been increased to 88 % on day 10. An increase in 36 % of serous discharge was noted over 10 days. In group 1, 40% of patients were having granulation tissue and it has been increased to 80% on day 10. An increase in granulation

tissue was seen in 40% of patients.

In group 2, 68% of people having slough on Day 0 and it was decreased to 52 % on day 10, that is 16% decrease in slough noted on day 10. In group 2, 44% of people were having serous discharge on Day 0 and it has been increased to 56% on day 10. That is 12 % increase in serous discharge over 10 days. In group 2, 48% patients were having granulation tissue on day 0 and it has been decreased to 40 % on day 10, that is 8% decrease in granulation tissue seen on day 10.

#### Discussion

Wound dressings have evolved from the status of providing physical protection to the raw surface, absorbing exudates and controlling local infections by local medications to the level of providing adequate environment promoting wound healing. This

has been achieved by modern wound dressing techniques by promoting granulation tissue formation. Concept of moist wound dressings which came into vogue in the 1960's which revolutionized wound care [7]. This led to further research in this direction leading to influx of many products like semi permeable plastic film dressings, hydrocolloids, hydro gels, collagen dressings into the wound care scenario, each claiming a better wound healing rate than the others. As the concept of 'outcome based medicine' evolved, the need for a better wound dressing

modality became more acute. Now wound dressing systems were compared not only on the basis of the rate of wound bed score but also on the cost of dressing. In the early 1980's, the concept of silver alginate interactive dressing was introduced into the field of chronic wound care.

This study was done as a prospective randomized controlled comparative study to compare the efficacy of silver dressing to conventional betadine dressing in management of chronic wounds

**Table 7:** Comparison of present study with Munter *et al*, [8]

Author	Sample size	Mean age	Sex ratio	Intervention	Results
Munter <i>et al</i> , (2006)	A total of 619 pt's I:326 vs C:293	Average age 69.8 yrs	F:381 vs M:238	I-Silver hydrophilic foam dressing C-local best practice	Reduction of wound area I: group had a significant decrease more than the C group Pain: I group had a significant improvement more than C group
Present study	Total of 50 pt's I:25 vs C:25	Average age 53.7 yrs	F:16 vs M:34	I-Silver dressing C-Betadine dressing	Granulation tissue growth is more in I group than in C group

I index case, C-control case

The above table shows a comparison of present study to a similar study conducted by Munter *et al*. The important difference between the present study and the one shown above is that in the present study wound has average age of 53.7 years, more over above study included all type of wounds which was not included in our study.

In present study there is decrease in the slough, and increased amount of granulation tissue is seen in the index case compared with the control case.

### Conclusion

In our present study it was concluded that healing rate, decrease in the wound slough, growth of granulation tissue, and patient compliance was better in silver dressing group as compared to conventional betadine dressing group. It was also seen that the silver dressing has significantly decreased purulent discharge from the wounds. Thus, silver dressing can be considered as a superior option in the management of chronic wounds. But further studies with larger population will be needed in the future before silver dressing can be added to the wide spectrum of treatment modalities available in the management of chronic wounds.

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