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CASE STUDY

Tuttha Powder ($CuSO_4$) for Unwanted Hyper granulation in Diabetic Ulcers: A Novel Approach to Debridement

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ABSTRACT
Diabetic foot ulcers (DFUs) are a prevalent complication of diabetes, often requiring debridement to promote wound healing. Hypergranulation tissue, characterized by excessive granulation tissue growth, can hinder the healing process. Current debridement methods, such as surgical, enzymatic, and autolytic debridement, have limitations and potential complications. This case study presents a novel approach to debridement using Tuttha Powder ($CuSO_4$) for managing unwanted hypergranulation tissue in DFUs. A 55-year-old male patient with a non-healing DFU and hypergranulation tissue was treated with Tuttha Powder ($CuSO_4$) application. The patient's wound was assessed for hypergranulation tissue, wound size, and healing progress. Results showed a significant reduction in hyper granulation tissue, with a decrease in wound size and improvement in wound healing. The patient experienced no adverse reactions or complications. This case study demonstrates the potential of Tuttha Powder ($CuSO_4$) as a safe and effective debridement agent for managing unwanted hyper granulation tissue in DFUs, promoting wound healing and improving patient outcomes.
Keywords: *Diabetic foot ulcers, Hyper granulation tissue, Debridement, Tuttha Powder, $CuSO_4$, wound healing.*

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INTRODUCTION

Diabetic foot ulcers (DFUs) are a prevalent and debilitating complication of diabetes, affecting approximately 15% to 25% of individuals with diabetes worldwide [1]. DFUs are characterized by chronic wounds that fail to heal, often resulting in prolonged hospitalization, increased healthcare costs, and reduced quality of life. One of the significant challenges in managing DFUs is the presence of hyper granulation tissue, which can hinder the healing process [2].

Hyper granulation tissue is a type of excessive granulation tissue growth that can occur in response to chronic inflammation, infection, or repetitive trauma [3]. This tissue can lead to the formation of a thick, fibrotic scar that can impede wound contraction and epithelialization, ultimately delaying wound healing. Current debridement methods, such as surgical, enzymatic, and autolytic debridement, have limitations and potential complications, including pain, bleeding, and infection [4].

Tuttha Powder ($CuSO_4$) is a traditional Ayurvedic medicine that has been used for centuries to treat various skin conditions, including wounds and ulcers [5]. Copper sulfate, the active ingredient in *Tuttha* Powder, has anti-microbial, anti-inflammatory, and wound-healing properties, making it a potential adjunctive treatment for DFUs. However, there is limited scientific evidence on the use of *Tuttha* Powder for managing hypergranulation tissue in DFUs [6].

This case study aims to explore the efficacy and safety of *Tuttha* Powder ($CuSO_4$) as a novel approach to debridement in managing unwanted hypergranulation tissue in DFUs. We present a case of a 60-year-old male patient with a non-healing DFU and hypergranulation tissue, who was treated with *Tuttha* Powder

($CuSO_4$) application. The patient's wound was assessed for hyper granulation tissue, wound size, and healing progress and the results are presented below.

Case report

A 60-year-old male patient presented to the Shalya Tantra OPD, xxxxx with a 1-year history of a non-healing ulcer on the dorsal aspect of his left little toe. He complained of pain, foul odour, pus discharge, swelling, and redness. The patient has a known history of diabetes mellitus for 2 years and was being managed with Tab. Glyciphage 500 mg BD, Tab. Voglibose 0.3 BD. Despite medication, his laboratory investigations revealed suboptimal glycemic control, with HbA1c levels of 11.70 %, Fasting blood sugar (FBS) of 200 mg/dl, and Postprandial blood sugar (PP_2BS) of 310 mg/dl. Bleeding time (BT) was 1 minute, and Clotting time (CT) was 2.45 minutes. To achieve better glycemic control and facilitate wound healing, he was initiated on insulin therapy with inj. Basolog 10 Units subcutaneously in afternoon.

Previous Treatment:

Patient had undergone regular wound dressings, antibiotic therapy, and topical silver nitrate application for hyper granulation, but these treatments were unsuccessful.

Intervention:

Patient presented with excessive hyper granulation tissue at the ulcer site, hindering epithelialization. A decision was made to use *Tuttha* powder ($CuSO_4$) for controlled debridement.

Procedure [7]

1. **Wound Preparation –** Cleansed with normal saline and dried**.**
2. **Application –** A small amount of *Tuttha* Powder was sprinkled over the hypergranulated tissue.
3. **Observation –** The powder was left for 5-10 minutes, followed by rinsing with normal saline**.**
4. **Dressing –** A sterile dressing was applied post-treatment**.**
5. **Follow-Up –** The procedure was repeated every 3 days for 2 weeks.

RESULT

Figure No.1
Day- 0

Figure No.2 Day- 3
Reduction in hyper granulation, no signs of infection

Figure No.3
Day 7- Noticeable epithelialization, reduced wound size

Figure No.4
Day 14- Complete resolution of hyper granulation, improved wound bed with progressing healing

Table No. 1: After treatment of *Tuttha* powder

Day	Observation
Day 3	Reduction in hyper granulation, no signs of infection
Day 7	Noticeable epithelialization, reduced wound size
Day 14	Complete resolution of hyper granulation, improved wound bed with progressing healing

- ✓ No significant pain, irritation, or adverse reactions were reported.

Management of Hyper granulation Tissue:

Patient presented with a significant challenge in the management of the diabetic foot ulcer, specifically the presence of excessive hyper granulation tissue at the ulcer site. This tissue hindered the process of epithelialization, thereby delaying wound healing.

Decision for Controlled Debridement:

A decision was made to utilize *Tuttha* powder ($CuSO_4$) for controlled debridement of the hyper granulation tissue. *Tuttha* powder, containing copper sulfate, has been shown to have antimicrobial and anti-inflammatory properties, making it an effective agent for promoting wound healing.

Rationale for *Tuttha* Powder:

The use of *Tuttha* powder was chosen for several reasons:

1. Controlled Debridement: *Tuttha* powder allows for controlled debridement of hyper granulation tissue, promoting a clean wound environment conducive to healing.
2. Antimicrobial Properties: Copper sulfate in *Tuttha* powder has antimicrobial properties, reducing the risk of infection and promoting a healthy wound environment.
3. Anti-Inflammatory Effects: *Tuttha* powder has anti-inflammatory effects, reducing edema and promoting wound healing.

Expected Outcomes:

The use of *Tuttha* powder for controlled debridement of hyper granulation tissue is expected to:

1. Promote Epithelialization: By removing excessive hyper granulation tissue, *Tuttha* powder is expected to promote epithelialization and wound healing.
2. Reduce Infection Risk: The antimicrobial properties of *Tuttha* powder are expected to reduce the risk of infection, promoting a healthy wound environment.
3. Improve Wound Outcomes: The use of *Tuttha* powder is expected to improve wound outcomes, reducing the risk of complications and promoting timely wound healing.

DISCUSSION

Diabetic foot ulcers (DFUs) are a common complication of diabetes, often requiring debridement to promote wound healing. Hyper granulation tissue, characterized by excessive granulation tissue growth, can hinder the healing process. Current debridement methods, such as surgical, enzymatic, and autolytic debridement, have limitations and potential complications.

The use of *Tuttha* Powder ($CuSO_4$) for controlled debridement of hyper granulation tissue in DFUs presents a novel approach to managing this challenging condition. Copper sulfate, the active ingredient in *Tuttha* Powder, has antimicrobial, anti-inflammatory, and wound-healing properties, making it an attractive agent for promoting wound healing. In this case report, the patient presented with a non-healing DFU and excessive hyper granulation tissue, which hindered epithelialization. The use of *Tuttha* Powder ($CuSO_4$) resulted in controlled debridement of the hyper granulation tissue, promoting a clean wound environment conducive to healing. The outcomes of this case report suggest that *Tuttha* Powder ($CuSO_4$) may be a valuable adjunctive treatment for managing hyper granulation tissue in DFUs. The antimicrobial properties of copper sulfate may reduce the risk of infection, while its anti-inflammatory effects may promote wound healing.

LIMITATIONS

While the outcomes of this case report are promising, there are several limitations to consider:

1. Small sample size: This case report presents a single patient, and further studies are needed to confirm the efficacy of *Tuttha* Powder ($CuSO_4$) in managing hyper granulation tissue in DFUs.
2. Short follow-up period: The follow-up period in this case report was relatively short, and longer-term follow-up is needed to assess the sustainability of the treatment outcomes.

CONCLUSION

In present case study, significant improvement was seen in hyper granulation tissue in DFUs. Hence it can be concluded that *Tuttha* Powder ($CuSO_4$) is effective for the management of DFUs. But its efficacy has to be validated through large scale clinical studies.

FUTURE DIRECTIONS:

Further research is needed to fully explore the potential benefits of *Tuttha* Powder ($CuSO_4$) in managing hyper granulation tissue in DFUs. Future studies should aim to:

1. Recruit larger sample sizes: Larger studies are needed to confirm the efficacy of *Tuttha* Powder ($CuSO_4$) in managing hyper granulation tissue in DFUs.
2. Assess long-term outcomes: Longer-term follow-up is needed to assess the sustainability of the treatment outcomes.
3. Compare with existing treatments: Comparative studies are needed to assess the efficacy of *Tuttha* Powder ($CuSO_4$) relative to existing treatments for hyper granulation tissue in DFUs.

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Declaration of Patient Consent: The authors declare that they have obtained consent from patient for publication of clinical information.

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