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Accelerated Wound Healing Through Ayurvedic Herbal Formulation Post Sacrococcygeal Fistulectomy: A Case Study on Efficacy and Clinical Outcomes

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Abstract:

Sacrococcygeal fistulas are routinely managed by surgical excision; however, postoperative wound healing in this anatomical region remains challenging due to high infection risk, prolonged inflammation, and delayed tissue regeneration. This study evaluates the efficacy of an Ayurvedic herbal formulation in promoting wound healing following sacrococcygeal fistulectomy in a 25-year-old male patient. The formulation comprises a synergistic blend of bioactive ingredients: bromelain (50 mg), curcumin (50 mg), papaya extract (50 mg), nagdon (10 mg), neem (10 mg), aloe vera (10 mg), calendula oil (0.002 mg), and sunflower oil. In addition to standard postoperative care, the herbal formulation was applied topically to the surgical wound. Wound healing was systematically assessed over a 28-day period using the Wound Healing Index (WHI), the Visual Analog Scale (VAS) for pain, and serial photographic documentation, with bi-weekly evaluations to monitor infection, inflammation, granulation tissue formation, and overall wound closure. Results demonstrated a marked improvement in healing, with WHI scores increasing from 3 (indicative of poor healing) on Day 1 to 9 (optimal healing) by Day 28. Concurrently, pain intensity, as measured by VAS, decreased significantly from 7/10 on Day 1 to 1/10 by Day 14. Early granulation tissue formation was noted by Day 7, and complete epithelialization was achieved by Day 21 without any signs of infection. The observed therapeutic benefits are attributed to the anti-inflammatory and proteolytic actions of bromelain, curcumin, and papaya extract, alongside the antimicrobial and soothing properties of neem, aloe vera, and calendula oil, while sunflower oil provided a protective barrier. These findings suggest that the integrative use of this Ayurvedic herbal formulation may substantially enhance postoperative wound healing in sacrococcygeal fistulectomy cases. Further controlled clinical trials are warranted to validate these preliminary observations and to establish broader clinical applicability.

Keywords: Sacrococcygeal fistulas, Wound Healing Index, Ayurvedic herbal formulation, Pain

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INTRODUCTION:

Sacrococcygeal fistulas, though routinely managed by surgical excision, remain a significant clinical challenge due to their predisposition to postoperative wound complications. Studies have reported wound infection rates as high as 20–30% following sacrococcygeal fistulectomy, a figure that underscores the complexity of healing in this anatomically challenging region (Smith et al., 2018; Kumar & Jain, 2020). One recent incident documented in a tertiary care center in North India involved a young male patient whose postoperative course was complicated by prolonged inflammation and infection, ultimately resulting in an extended hospital stay and increased healthcare costs.The inherent difficulty in achieving timely wound healing in the sacrococcygeal area is multifactorial. The region's constant exposure to moisture, high bacterial colonization, and relatively poor vascularity contribute to delayed tissue regeneration and a persistent inflammatory state. In this context, conventional postoperative care sometimes falls short, prompting the need for integrative approaches that enhance tissue repair mechanisms. Recent advances in integrative medicine have drawn attention to the potential benefits of Ayurvedic herbal formulations in wound management. Bioactive compounds such as bromelain, curcumin, and papaya extract, along with other herbal agents like nagdon, neem, aloe vera, calendula oil, and sunflower oil, have demonstrated anti-inflammatory, antimicrobial, and tissue-regenerative properties in various preclinical and clinical studies (Patel et al., 2019; Rao & Singh, 2021). These properties suggest that an Ayurvedic formulation combining these ingredients may accelerate wound healing, reduce infection rates, and ultimately improve clinical outcomes.This case study, evaluates the clinical efficacy of such an Ayurvedic formulation in a young male adult. By addressing the shortcomings of traditional wound management in the sacrococcygeal region, this study aims to provide valuable insights into a novel, integrative therapeutic strategy that could potentially transform postoperative care in similar high-risk surgical scenarios.

Methodology

Patient Profile

A 25-year-old male presented with a recurrent sacrococcygeal fistula. He underwent a standard fistulectomy under general anesthesia. The postoperative wound measured approximately 5 cm × 3 cm and was classified as a clean-contaminated surgical wound.

Treatment Protocol

Topical Application: The wound was treated twice daily with the Ayurvedic herbal formulation.

Standard Care: The wound was cleansed with saline, and dressings were applied after each application of the herbal formulation.

Follow-Up: Assessments were conducted on Days 1, 7, 14, 21, and 28.

Criteria for Assessment

1.Wound Healing Index (WHI): A score from 0 (poor healing) to 10 (complete healing).

2.Visual Analog Scale (VAS): Pain intensity rated from 0 (no pain) to 10 (severe pain).

3.Photographic Documentation: Progression of wound closure and granulation.

4.Infection Signs: Redness, swelling, pus, or foul odor were monitored.

Results

Wound Healing Progression

Day 1: WHI score of 3. The wound appeared clean, with mild redness and swelling. Pain was rated at 7/10.

Day 7: WHI score increased to 5. Granulation tissue was evident, and swelling had reduced. Pain reduced to 4/10.

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Day 14: WHI score of 7. The wound size decreased by approximately 40%, and epithelialization was underway. Pain reduced to 1/10.

Day 21: WHI score of 8. Complete epithelialization was observed with no infection.

Day 28: WHI score of 9. The wound was fully healed, with a smooth scar and no residual pain.

Pain Reduction

•Day 1: 7/10
•Day 7: 4/10
•Day 14: 1/10
•Day 21: 0/10

Photographic Evidence: Images showed significant reduction in wound size and inflammation over the 28-day period.

DISCUSSION:

The healing of postoperative wounds in the sacrococcygeal region is notoriously complex due to inherent anatomical challenges, including constant moisture, high bacterial colonization, and limited vascularity. In this case study, the utilization of an Ayurvedic herbal formulation post-surgery demonstrated promising clinical outcomes. The formulation's constituent bioactives—bromelain, curcumin, and papaya extract—are known for their anti-inflammatory and proteolytic properties. Bromelain facilitates the debridement of necrotic tissue and reduces local inflammation, thereby setting the stage for effective healing (Patel, 2020). Curcumin, a potent anti-inflammatory agent, not only inhibits pro-inflammatory cytokines but also promotes collagen synthesis, essential for tissue repair (Singh et al., 2019). Papaya extract further contributes by serving as a natural enzymatic debriding agent that accelerates wound cleansing.Moreover, the inclusion of neem and calendula oil in the formulation offers antimicrobial benefits that are critical in preventing postoperative infections—a common complication in sacrococcygeal surgeries (Pradhan & Suresh, 2018). Aloe vera and sunflower oil add a soothing effect and provide a protective barrier, respectively. Aloe vera enhances epithelialization, and sunflower oil maintains skin hydration, both crucial for reducing scar formation and ensuring a smoother healing process (Rao & Singh, 2021). The observed clinical improvements—an increase in WHI from 3 to 9 and a reduction in pain from 7/10 to 1/10 within two weeks—underscore the potential of this integrative approach. Early granulation tissue formation by Day 7 and complete epithelialization by Day 21 highlight the accelerated healing process when compared to conventional wound care protocols reported in the literature (Smith et al., 2018; Kumar & Jain, 2020). The rapid progression of healing in this patient also suggests that such a formulation could reduce hospital stay durations and overall healthcare costs.However, it is important to note that these findings are based on a single case study. While the results are encouraging, they warrant further validation through randomized controlled trials involving a larger cohort. Future studies should also explore the long-term effects on scar quality and patient satisfaction. Additionally, the mechanistic pathways through which these bioactive compounds interact synergistically remain an area for further investigation. Integrative approaches such as this may pave the way for innovative, cost-effective solutions in postoperative care, especially in regions where traditional Ayurvedic practices are well established (Gupta et al., 2022).

CONCLUSION:

This case study demonstrates that the Ayurvedic herbal formulation significantly accelerated wound healing, reduced pain, and improved overall patient outcomes after

sacrococcygeal fistulectomy. The results support its potential as an effective, low-cost adjunct to conventional postoperative wound care, meriting further clinical research.

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Fig.1: Wound on Day 1

Fig.2: Granulation tissue formation on Day 7

Fig.3: Complete epithelialization by Day 21

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