

# Complementary Medicine Techniques (Hirudotherapy, Cupping Therapy and Apitherapy) in the Management of Cervical Abscess in a Diabetic Patient: A Case Report

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## ABSTRACT

**Introduction:** Deep neck abscesses are serious infections, particularly in diabetic patients. Standard treatment involves surgical drainage and antibiotics, which may be challenging in high-risk individuals. This report details an alternative treatment approach using complementary medicine techniques (Hirudotherapy, Cupping Therapy and Apitherapy) for a patient deemed ineligible for surgery.

**Methods:** A 72-year-old male with poorly controlled type 2 diabetes presented with a cervical abscess. Following shared decision-making in agreement with the patient's family, surgical intervention was not undertaken due to the patient's advanced age and high operative risk. An integrative protocol, including medicinal Leech Therapy, cupping therapy, and apitherapy (honey, propolis, and bee venom), was applied. Clinical progression was monitored over 18 days.

**Results:** The integrative regimen led to complete abscess resolution, reduced inflammation, alleviated neurological symptoms, and restored motor function. No surgical drainage or systemic antibiotic therapy was required. Close monitoring for systemic infection was maintained throughout the treatment.

**Conclusions:** This case suggests that selected complementary medicine modalities may serve as a feasible alternative option for managing complex deep neck abscesses in carefully selected high-risk patients. Further rigorous clinical trials are needed to validate the efficacy and safety of such integrative protocols.

**Keywords:** Cervical Abscess, Leech Therapy, Cupping Therapy, Apitherapy, Wound Healing

## Introduction

Abscesses are localized accumulations of pus resulting from microbial invasion, tissue necrosis, and inflammatory responses. They are distinguished by oedema, erythema, and discomfort, and may manifest in various anatomical locations, including the cutaneous, hepatic, pulmonary, or spinal regions. They also present a considerable risk of systemic dissemination, including organ dysfunction or sepsis [1,2]. Due to hyperglycemia-induced immune dysregulation, compromised neutrophil function, and microvascular complications, individuals with diabetes exhibit increased vulnerability to infections and experience delayed wound healing. Diabetic patients are nearly 5 times more likely to develop pyogenic liver abscesses and account for up to 56.0% of all deep neck space infection cases.

Globally, the prevalence of chronic diabetic wounds is estimated at 6.3%, with a significantly higher mortality rate (up to 19.2%) in diabetic deep neck space infections compared to non-diabetic cohorts [3–6].

Surgical drainage is the sole effective treatment for accessible abscesses, as it enables the rapid decompression, source control, and microbiological analysis. In comparison to primary suturing, free drainage is recommended for superficial abscesses (e.g., cutaneous/subcutaneous), as it reduces the likelihood of recurrence [7]. Necrotic tissue involvement in diabetic patients frequently requires extended debridement, underscoring the critical role of surgery in infection management [8, 9]. The gold standard for accessible abscesses remains prompt surgical incision and drainage, administration of broad-spectrum intravenous

antibiotics (e.g., piperacillin-tazobactam), and aggressive glycemic control. Alternatives such as ultrasound-guided needle aspiration may be considered for smaller collections, though surgical drainage is preferred for deep-seated infections [10–13].

This study aims to explore the use of complementary medicine methods as potential therapeutic options in abscess management when surgical drainage or antibiotic treatment is impractical. These methods involve the application of medicinal leeches, whose saliva comprises biologically active compounds including anticoagulants, vasodilators, antibacterial agents, analgesics, and anti-inflammatory substances [14]. Cupping therapy is a traditional practice historically utilized to facilitate detoxification and improve blood circulation [15]. A combination of honey and propolis has exhibited synergistic effects in wound healing [16]. Clinical studies have validated the effectiveness of honey in treating diabetic foot ulcers and deep neck abscesses, demonstrating a healing rate enhancement of approximately 30.0–40.0% relative to standard dressings [17]. Research has demonstrated that propolis possesses extensive antimicrobial activity against multiple bacterial strains, including *Escherichia coli* and *Staphylococcus aureus*, which are prevalent causative agents of abscess formation [18, 19]. Moreover, bee venom and its primary constituent, melittin, exhibit significant antibacterial properties against various skin pathogens, including *Streptococcus pyogenes* and methicillin-resistant *Staphylococcus aureus* (MRSA) [20, 21].

The primary objective of this case report is to evaluate the feasibility and clinical outcome of a multimodal complementary medicine protocol integrating medicinal leech therapy, cupping, and apitherapy as an alternative management strategy for a deep cervical abscess in a high-risk diabetic patient where conventional surgical intervention and systemic antibiotics were not feasible. Furthermore, 'complementary medicine' refers to the integration of therapeutic modalities, specifically hirudotherapy, cupping, and apitherapy, used in conjunction with or as an alternative to standard allopathic care to support physiological healing and infection resolution in a high-risk patient.

## Case presentation

### Patient Information

A 72-year-old male presented to the hospital with a chief complaint of a sudden-onset, painful swelling on the right side of his neck. The pain was severe and radiated down his right arm, associated with a decreased range of motion in both his neck and arm. He also reported subjective fever and general malaise (Fig 1).



**Figure 1** Initial presentation of the deep cervical abscess, showing significant swelling and inflammation.

**Clinical Findings and Medical History:** On physical examination, the patient was febrile and appeared to be in significant discomfort. A deep, tender, fluctuant mass was palpable in the right posterior cervical triangle, with overlying erythema and warmth, consistent with a deep neck abscess. The palpable mass in the right posterior cervical triangle measured approximately 5x4 cm. It extended from the mid-cervical region posteriorly towards the trapezius muscle, with poorly defined anatomical boundaries due to significant surrounding edema. His past medical history was significant for a long-standing, poorly controlled type 2 diabetes mellitus. Laboratory results on admission confirmed severe hyperglycemia, with a random blood glucose level of 400 mg/dL and a glycated hemoglobin (HbA1c) level of 11.0%, he was taking 60 units of insulin daily, indicating very poor glycemic control over the preceding months.

### Therapeutic Intervention and Rationale

The medical team recommended immediate surgical incision and drainage. However, the patient's family refused consent due to his advanced age and frail condition secondary to chronic diabetes. Given this refusal, and with informed consent from the patient and family, an integrative treatment plan was devised under direct physician supervision. The plan focused on complementary therapies to promote drainage, control infection, reduce inflammation, and facilitate healing. Systemic antibiotics were not initiated due to the family's preference for a non-pharmacological approach, given the patient's overall frailty and the decision to proceed with close clinical and laboratory monitoring.

### Ethical statement

This case report was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from the patient's legal guardians for the administration of the integrative treatment protocol and the subsequent publication of the case details and clinical images.

### Treatment procedures

The integrative treatment protocol was designed to address the infection, inflammation, and purulent collection through a multi-modal approach. The procedures were performed in a series of sessions (Table 1), and Fig 2.

**Table 1** Treatment Protocol

Session/Day	Procedure	Rationale
<b>Day 1</b> (Session 1) <b>Figure 2</b>	i. Medicinal leech therapy applied to the abscess. ii. Wet cupping applied over the leech bite site after detachment. iii. Disinfection with 3% hydrogen peroxide. iv. Topical application of honey-propolis mixture. v. Intramuscular Vitamin K injection.	- Leeches: Reduce venous congestion, anti-inflammatory, analgesic. - Cupping: Promote drainage of pus and blood. - H <sub>2</sub> O <sub>2</sub> : Antiseptic cleansing. - Honey/Propolis: Antimicrobial and wound healing. - Vitamin K: Control post-leech bleeding.
<b>Day 2</b> (Session 2)	Repeat of Session 1 protocol.	Reinforce initial therapeutic effects.
<b>Day 3</b> (Session 3)	i. Wet cupping over the C7 cervical vertebra with superficial skin incisions. ii. Dry cupping applied bilaterally on the L2 lumbar vertebra.	- Wet Cupping (C7): Counter-irritation, stimulate local and systemic immune response. - Dry Cupping (L2): Address referred pain, promote general relaxation.
<b>Day 6</b> (Session 4)	i. Cupping cup with honey applied directly over the abscess opening for 5 minutes, inducing discharge. ii. Disinfection with hydrogen peroxide. iii. Topical application of honey-propolis mixture.	- Honey Cupping: Osmotic effect to draw out purulent material. - Honey/Propolis: Continued antimicrobial action and wound bed preparation.
<b>Day 9</b> (Session 5)	Bee venom therapy injections (1:1 concentration) administered to the perilesional area, shoulders, C7 region, and L2 region after a negative allergy test.	Introduce potent anti-inflammatory and antimicrobial effects of melittin and other venom components.
<b>Days 12, 15, 18</b> (Subsequent Sessions)	i. Topical application of honey-propolis mixture. ii. Bee venom injections (20 units per session) to the perilesional area, C7, and L2 regions.	Maintain therapeutic levels of apitherapy agents to ensure complete resolution and tissue regeneration.



**Figure 1** Treatment in progress during the second session, showing the application of complementary therapies. (A) During the application of leeches, (B) The shape of the abscess appears after cupping.

### Outcomes and follow-up

The patient's clinical condition was monitored on a daily basis. After the initial sessions, there was a gradual increase in progress. The patient had made a full recovery by the conclusion of the 18-day treatment period (Fig 3). Included in the specific results were: (i) Infection Resolution: The abscess's swelling, erythema, and tenderness have completely resolved. The patient's body temperature returned to its normal state; (ii) The localized neck pain and radiating pain in the right arm were alleviated; (iii) Functional Recovery: The neck and right arm were restored to a full and painless range of motion. The symptoms of nerve root compression, including numbness, were resolved; (iv) Healing of the wound site: The wound site exhibited healthy granulation tissue formation, which was followed by complete re-epithelialization and healing without significant scarring; and (v) Adverse events were systematically monitored daily through clinical examination, focusing on signs of systemic infection (fever, tachycardia), localized allergic reactions to bee venom or leeches, and any prolonged bleeding at the hirudotherapy sites. No such adverse events were recorded during the 18-day treatment course.



**Figure 2** The healed cervical region after 18 days of the integrative complementary treatment, showing complete recovery and minimal scarring

Following discharge, the patient reported a subjective improvement in overall comfort and neck mobility, which he described as a return to his baseline functional status. The patient was monitored for three months. This included a tele-consultation at two weeks and two months, and an in-person follow-up at one month post-discharge. No recurrence of the abscess or secondary complications was observed during this period.

## Discussion

The successful resolution of a deep neck abscess in a high-risk diabetic patient, which was exclusively treated with complementary therapies, is significant and requires a more in-depth discourse. In the absence of surgical drainage and antibiotics, the standard of care presented a difficult clinical dilemma. Wieland et al utilized the integrative protocol to replicate and potentially improve the objectives of conventional treatment, including drainage, infection control, and tissue healing, by utilizing the proposed mechanisms of several traditional therapies [22].

**Mechanisms of Integrated Wound Healing:** The multimodal approach was essential, as each therapy likely contributed to a different aspect of healing, resulting in a synergistic effect. **Hirudotherapy (Medicinal Leech Therapy):** The initial treatment for non-surgical drainage and decongestion was the use of medicinal leeches (*Hirudo medicinalis*). Leech saliva is a complex biological fluid that contains more than 100 bioactive substances [23]. Hirudin, a potent thrombin inhibitor that prevents clotting and maintains blood flow, calin, which inhibits platelet aggregation, and hyaluronidase, which increases tissue permeability, allowing other salivary components to penetrate deeper, are key components. In addition, saliva contains antimicrobial substances, anti-inflammatory agents (e.g., bdellins and eglins), and vasodilators [24]. Medicinal Leech Therapy likely aided in this instance by reducing the localized pressure, draining purulent and sanguineous fluid, improving microcirculation to the ischemic tissues, and reducing local inflammation. This is particularly advantageous in a diabetic patient with compromised blood flow [25].

**Cupping Therapy:** Dry and wet cupping were implemented. The drainage effect was likely augmented by the initial dry cupping following the leech application, as a result of the negative pressure. Wet cupping, which is traditionally performed at the C7 vertebra, is believed to have systemic effects. Al-Bedah et al. [26] propose that the transmission of negative pressure to underlying connective tissue, which promotes decongestion, improves lymphatic drainage, and enhances local circulation, is the mechanism. Hussein et al. [27] reported the successful treatment of a hand abscess with wet cupping in a case report. This suggests that suction-based evacuation may be more effective than manual squeezing because it better

preserves the pyogenic membrane, thereby preventing the spread of bacteria. In this instance, the objective of cupping was to induce a systemic immune and circulatory response while simultaneously draining the local abscess [27].

**Apitherapy (Bee Venom, Propolis, and Honey):** Infection control and wound regeneration were significantly influenced by apitherapy. Propolis and honey: The synergistic antimicrobial and wound-healing properties of honey and propolis are well-documented [28]. Honey's broad-spectrum antibacterial activity is facilitated by its low pH and the production of hydrogen peroxide through glucose oxidase, which create a hyperosmolar environment that dehydrates bacteria. It also has anti-inflammatory properties and stimulates the growth of granulation tissue and autolytic debridement [29]. Propolis, a resinous mixture that honeybees collect, is abundant in phenolic compounds and flavonoids that possess potent antibacterial, antifungal, and anti-inflammatory properties [30]. Bee Venom: Bee venom, and its primary peptide melittin, exhibit significant antibacterial activity against a range of pathogens, including *Staphylococcus aureus* and MRSA [31]. This combination, when used as a topical dressing, provides a continuous antimicrobial barrier and a moist, pro-healing environment, which is essential for diabetic wounds [32]. It is also a potent anti-inflammatory agent. The purpose of its application in the later stages of treatment was to alleviate the prolonged inflammatory response that is a hallmark of diabetic wounds and to eradicate any remaining infection.

The synergistic effects between the various interventions: The success of this protocol lies in the synergistic interaction between the three modalities. Medicinal leech therapy initiated the process by reducing venous congestion and increasing tissue permeability through hyaluronidase. This was followed by cupping therapy, which utilized negative pressure to mechanically evacuate the loosened purulent material. Finally, apitherapy (honey, propolis, and bee venom) provided a broad-spectrum antimicrobial environment and stimulated granulation tissue, effectively replacing the need for systemic antibiotics and surgical debridement.

Evaluation against the standard of care and clinical context. Surgical emergencies are categorized as deep neck infections. Ensuring airway patency, administering intravenous broad-spectrum antibiotics (e.g., ampicillin-sulbactam, clindamycin), and expeditiously executing surgical incision and drainage constitute the standard of care [33, 34]. The success of the complementary protocol in this case is notable for its capacity to fulfil the primary goals of surgical intervention, drainage and source control using non-invasive or minimally invasive techniques. The components of apitherapy served as a topical antibiotic,

modulating the polymicrobial milieu, whereas medicinal leech therapy and cupping functioned as a biological scalpel, facilitating the drainage of the abscess.

The diabetic context is critically significant. Diabetes poses a considerable clinical challenge due to compromised wound healing [35]. The therapies utilized in this protocol may have directly mitigated certain pathophysiological defects associated with diabetic wounds. Medicinal Leech Therapy's improved microcirculation may have mitigated vascular insufficiency, while the anti-inflammatory properties of its components may have interrupted the cycle of chronic inflammation that hinders healing [36].

The report's primary limitation is that it constitutes a singular case study. The findings, while remarkable, are not suitable for generalization. The favorable result may be ascribed to the particular characteristics of the infecting organisms or individual patient factors. The causative pathogens and their susceptibility to treatments remain unidentified due to the lack of microbiological culture. Furthermore, the documentation of the patient's glycemic control throughout the treatment period was insufficient, a vital factor in the healing process. This case should not be construed as an endorsement to supplant traditional surgical management for deep neck abscesses. Surgery is the treatment that has demonstrated reliability, speed, and efficacy. This report presents a persuasive case for the efficacy of integrative medicine in particular, clearly delineated situations: for high-risk patients who are unsuitable for surgery or decline surgical intervention. It strongly suggests that a systematic, multi-modal complementary strategy, administered under medical oversight, may serve as a feasible alternative.

To evaluate the efficacy and safety of this integrative protocol relative to standard care, rigorous randomized controlled trials are necessary. Such studies should incorporate standardized wound healing assessments, comprehensive microbiological analyses, and the quantification of inflammatory markers. The distinct contributions and possible synergies of each component therapy would be elucidated through individual and combinatorial investigations.

## Conclusion

This case report describes clinical improvement in a patient with a deep cervical abscess following a multi-modal complementary medicine protocol (apitherapy, cupping, and hirudotherapy). During 18 days, the treatment successfully managed drainage, infection control, and wound healing, thus obviating the need for high-risk surgery. Although surgical drainage and antibiotics are the standard treatment for deep neck abscesses, this case demonstrates that a supervised, integrative approach may be a viable therapeutic alternative for patients who

are contraindicated or decline conventional treatment. While these findings suggest that selected complementary medicine modalities may serve as a feasible alternative in high-risk patients, the results from a single case report must be interpreted with caution and require validation through more rigorous clinical trials. It highlights the significance of examining traditional medical systems to discover innovative solutions for complex clinical problems and stresses the urgent need for thorough clinical research to validate these promising, albeit unverified, therapeutic approaches.

## Competing interests

The authors declare no conflict of interest.

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## Author contributions

A.A.R. and E.A.F.H. were involved in the conception and design of the study and the treatment of the patient. A.H.S. contributed to the data analysis and interpretation. All authors participated in drafting and revising the manuscript and have approved the final version for publication.

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