



ROLE OF LEECH THERAPY IN MODERN SURGICAL PRACTICE: A REVIEW

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ABSTRACT

Unani medicine is based on the holistic approach that focuses on the various elements of an individual. The Role of Unani medicine in surgical problems is significant, as it provides natural and effective practice for conditions such as haemorrhoid, varicose veins, Non-healing wounds, etc. Furthermore, Unani physician incorporates different Ilaj Bit Tadbeer procedures such as massage, cupping therapy, and leech therapy for various diseases. Leech therapy is an ancient Unani traditional procedure that has seen resurgence in popularity in medicine, particularly in surgical diseases like Cellulitis, Varicocele, Arthritis, Pain, Surgical wounds, Diabetic foot, Urological diseases etc. In this review we tried to review the role of leech therapy in modern surgical practice. Further research into the mechanisms of action and standardization of treatment protocols may enhance the integration of leech therapy into mainstream surgical procedures.

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INTRODUCTION

Unani medicine, an ancient system of alternative medicine originating in Greece, focuses on balancing the four humours of the body to maintain health and treat diseases. While treating the patients Unani doctor consider all the aspect of individual viz physical, mental, and spiritual, also known as holistic approach. The role of Unani medicine in surgical problems is significant, as it provides natural and effective protocol for conditions such as haemorrhoid, varicose veins, non-healing wound, kidney stones, prostate issues, and various orthopedic problems. Unani practitioners believe in concept of

maintaining a balance in temperament and body humours in the body to ensure the finest state in health. In addressing surgical conditions, Unani medicine frequently recommends herbal treatments, dietary adjustments, lifestyle changes, and physical therapies. Common categories of drugs used in surgical ailments include *Jali*, *Mujafif*, *Jazib*, *Musaffie dam*, and *Mudammil Quruh*. Additionally, Unani medicine highlights the importance of a healthy diet rich in nutrients and hydration to support internal organ function. Furthermore, Unani medicine incorporates therapeutic techniques (Ilaj Bit Tadbeer) such as massage, cupping therapy, and exercise to

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improve circulation, reduce inflammation, and strengthen the body function. The well-known scholar of Unani medicine, *Ibne Sina* in his legendary book "Canon of Medicine has mentioned thirty-six *Ilaj bit Tadbeer* procedure (regimes)". (Sina I.)

MATERIALS AND METHODS:

The databases utilized for obtaining information for the current review were MEDLINE, PubMed, and related databases, such as AYUSH Research Portal, Web of Science, Google Scholar etc.

RESULT AND DISCUSSION

Leech therapy

Leech therapy or hirudotherapy, is an ancient medical procedure that has seen a surge in popularity in medical treatment, particularly in surgical diseases. The history of Leech therapy in surgery dates back thousands of years and has proven beneficial in various medical conditions. Ibn e Sina (980- 1037AD) described in his treatise "Al Qanoon" that leeches can suck blood from deep veins. (Lone AH et al, 2011).

Indication of leech therapy (Lone AH et al, 2011, Tabri R, 2002)

Diseases name (Unani)	Possible Allopathic name
<i>Bars</i>	Vitiligo
<i>Bawaseer</i>	Piles
<i>Daaul feel</i>	Elephantiasis
<i>Dardepindali</i>	Painful Calf Muscle
<i>Daulsadaaf</i>	Psoriasis
<i>Dawali</i>	Varicose Vein
<i>JarabulAjfaan</i>	Blepharitis
<i>Kalaf</i>	Warts
<i>Khanaazeer</i>	Lymphadenitis
<i>Malankhoonia</i>	Mania
<i>Namash</i>	Chloasma
<i>Narfarsi</i>	Eczema
<i>Nawaseer</i>	Fistula In Ano
<i>Qooba</i>	Ringworm
<i>Qooruhekhabisa</i>	Septic Wound, Non-Healing Ulcer
<i>Saafa</i>	Tinea Corporis
<i>WajaulMufasil</i>	Osteoarthritis
<i>Warm</i>	Inflammation
<i>Warmehalq</i>	Pharyngitis
<i>WarmeTajawefulAnaf</i>	Nasal sinusitis

Recently the application of leeches in thromboembolic diseases (coronary artery thrombosis and Ischemic heart diseases), plastic surgery, replantation and various reconstructive surgeries is increasing globally. (Kreamer B A et al, 1988)

Mechanism of action of leech

One of the main indications of hirudo therapy in surgical diseases is in promoting blood circulation

and preventing blood clots. Leeches have a natural anticoagulant in their saliva that helps to prevent blood from clotting while they are feeding. This is especially beneficial in surgeries where there is a potential for blood pooling or clot formation, such as replantation surgeries or skin graft procedures. During procedure leech injects more than 20 identified bioactive substances such as antistasin, eglins, guamerin, hirudin, saratin, bdellins,

complement, and carboxypeptidase inhibitors. These chemical substances have proven analgesic, anti-inflammatory, platelet inhibitory, anticoagulant, and thrombin regulatory activity, as well as extracellular matrix degradative and antimicrobial effects. (M Alaama, et al, 2024)

Leech Therapy in Surgical Diseases

Leech therapy in Reconstructive and Plastic Surgery
The mechanism of action of Leech therapy in Reconstructive and Plastic Surgery is to improve tissue capillary pressure and promote local anticoagulation through three main mechanisms, active suction, secretion of vasoactive substances such as hirudin, and passive oozing of blood through bite wounds after leech removal. (Kreamer B A et al, 1988).

Diabetic foot

Zaidi et al published an article titled "Unani treatment and leech therapy saved the diabetic foot of a patient from amputation" demonstrates an option to treat poorly healing diabetic wounds with Unani medicine (blood purifier and deobstruent) in addition to hirudotherapy successfully. (Zaidi SMA, 2016).

Varicose vein:

Eminent Unani scholars have mentioned venesection in varicose but A. Arzani and M. Azam Khan mentioned leech therapy in varicose veins. The result of hirudotherapy in the varicose vein is due to the chemical in leech saliva which contain anticoagulant, thrombolytic, anti-inflammatory, antibiotic, anaesthetic and analgesic properties. Hirudin and calin are anticoagulants. Enzyme Destabilase has thrombolytic effect. Histamine-like substances, acetylcholine and carboxypeptidase has a vasodilator effect. Anticoagulant, thrombolytic and vasodilators present in leech saliva produce prolonged bleeding and hypovolemic haemodilution of the blood which reduces pressure at the vessels and excretion of metabolites at the site of microcirculatory units. (Bapat RD et al, 1998).

Venous congestion

Venous congestion occurred because of change between arterial inflow and venous outflow, leads to stasis of blood in the tissues. The lack of tissue perfusion causes hypoxia, acidosis, and arterial thrombi formation, which can progress to tissue necrosis and wet gangrene. (Weinfeld AB 2000) In cases of venous congestion, where blood flow is obstructed due to compromised veins, leech therapy

can alleviate the congestion and improve blood flow to the affected area. By delicately attaching leeches to the skin, they can help to remove excess blood and promote circulation, which can be crucial in saving compromised tissue. (Mousavian A, 2022).

Haemorrhoids

Haemorrhoids, commonly known as piles, are swollen veins in the anal and rectal area that can cause discomfort, pain, and bleeding. Hirudotherapy has been explored as a potential management option for piles, offering a natural and alternative approach to managing this common condition. One of the key benefits of leech therapy in piles is its ability to improve blood circulation and reduce congestion in the affected area. When leeches are applied to the anal region, they release their saliva containing anticoagulant and anti-inflammatory properties. This can help to reduce swelling, alleviate pain, and promote healing of the inflamed hemorrhoidal veins. Furthermore, leech therapy is a minimally invasive and relatively low-risk treatment option for piles. Unlike surgical interventions or other medical procedures, leech therapy for piles does not involve incisions or anaesthesia, making it a more appealing option for some patients. (Bhagat PJ et al, 2012).

Surgical wound

Leech therapy is effective in helping to reduce swelling and inflammation in surgical wounds. The saliva of leeches contains enzymes that have anti-inflammatory properties, which can help to improve healing outcomes and reduce the risk of infection. (Das B.K, 2014).

Pain

Enzymes present in leech saliva have been found to have analgesic properties, which can help to relieve surgical pain. By improving blood flow and reducing inflammation, leech therapy may offer symptomatic relief for individuals suffering from pain. (Koeppen D et al, 2013).

Arthritis

The analgesic action of leech therapy was established in various clinical studies on patients with osteoarthritis which claimed that leeching was more relieving than the local application of diclofenac without any adverse effects. (Michalsen A et al, 2003). Similarly, another study proved that hirudin can reduce synovial inflammation in arthritis by inhibiting DING protein, a derivative of synovial stimulatory protein acting as autoantigen in arthritis

patients. (Cott K *et al*, 2002) In another study, a group of women with osteoarthritis of the first carpometacarpal joint were given a treatment course by two to three leeches locally. All treated individuals revealed less pain and disability improvement. The effect of leech therapy was observed after seven days of treatment and lasted for sixty days. (Michalsen A *et al*, 2008).

Another clinical trial on patients with chronic osteoarthritis at the knee joint verified that leech therapy can effectively reduce the necessity for analgesic intake. It has been observed that a double treatment regimen at a 4-week interval exhibited a longer-term relieving and enhanced physical activity than a single treatment course. (Andereya *et al*, 2008) Furthermore, the effectiveness of leech therapy in combination with the traditional Unani herbal formulation was also evaluated. It was observed that patients who received the combined treatment showed less pain and stiffness with better working ability. (Zaidi *et al*, 2009) Michalsen A *et al*, states that the study indicated leech therapy as an analgesic for iliosacral joints pain and cervicobrachialgia. (Michalsen A *et al*, 2007)

Cellulitis

A study conducted by Kshirsagar *et al* concluded that leech therapy has anti-cellulite action without causing any toxicity or side effects. (Kshirsagar *et al*, 2023).

Varicocele

Varicocele is characterized by the enlargement of veins of the scrotum, which leads to discomfort, pain, and in some cases, male infertility. While varicoceles can be managed through various treatment options, including surgery and medication, leech therapy has emerged as a potential alternative approach to addressing this condition. The anti-inflammatory action of leech saliva decreases the swelling and discomfort associated with varicocele. This may lead to symptomatic relief for individuals experiencing pain or heaviness in the scrotum. A single case study on Varicocele done by Sudha HM *et al* concluded that leech therapy helps in reducing local inflammation, ischaemic and localized venous congestion, thereby reduces the need for surgical intervention in varicocele. (Sudha HM *et al*, 2019).

Leech therapy in urology

Battin O *et al* published an article in a reputed journal, African Journal of Urology by the titled Systematic Review of Medicinal Leech Therapy In Urology

concluded that leech therapy was used in 10 of the 13 (75%) cases for the treatment of congested blood viz. five cases (38.5%) of venous congestion status post-penile replantation, two cases (15.4%) of scrotal hematoma presenting as postoperative complication, two cases (15.4%) of venous congestion of the glans following neonatal bladder exstrophy repair, and one case (7.6%) for refractory priapism. The remaining cases (23.1%) treated penoscrotal oedema in patients with hormone refractory prostate CA treated with radical radiation therapy. (Battin A.O *et al*, 2023).

Hirudotherapy was the first and only treatment reported for urological indication in 10 of the 13 urological cases (76.9%). One case reported a scrotal hematoma refractory to intraoperative evacuation during a bilateral hydrocele procedure. The other case documented an attempt to relieve glans venous congestion status post-bladder exstrophy and epispadias repair by bilateral incision after dilute heparin injection to the site. (Battin A.O *et al*, 2023).

DISCUSSION

The role of Unani medicine in surgical problems lies in its emphasis on restoring the body's natural balance and promoting overall well-being. By addressing the root cause of surgical issues and focusing on prevention through lifestyle modifications, Unani Medicine offers a holistic approach to managing and treating these conditions. Overall, leech therapy in surgical diseases has proven to be a valuable adjunct to modern medical practices. While it may seem unconventional, the benefits of using leeches in certain surgical procedures are well-documented and continue to be explored in various medical disciplines. It is important to emphasize that additional research is required to fully comprehend the effectiveness and safety of leech therapy. As research in hirudotherapy continues further clinical trials and scientific investigations are essential to establish leech therapy as a recognized and evidence-based treatment for various diseases.

CONCLUSION

In conclusion, leech therapy represents an intriguing approach to managing varicocele, piles, varicose veins, urological problems and pain offering a natural and alternative option for individuals seeking non-surgical interventions. As research in this field continues to evolve, the role of leech therapy in various surgical treatments may become more defined, providing patients and healthcare providers with additional therapeutic choices in addressing this

modern surgical practice In conclusion, we can anticipate an expanded range of applications for leeches in modern surgical practices as advancements continue.

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