



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

LEECH THERAPY (JALAUKAVACHARANA) IN SANDHIGATA VATA WITH REFERENCE TO OSTEOARTHRITIS

Author file

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Abstract

Sandhigata Vata is a Vata-dominant musculoskeletal condition described in Ayurvedic classics, characterized by joint pain, swelling, stiffness, and restricted movement. It shows close clinical resemblance to Osteoarthritis, a degenerative joint disorder marked by progressive cartilage loss and inflammation. Among Panchakarma therapies, Jalaukavacharana (leech therapy), a form of Hirudotherapy, has been traditionally indicated for pain and inflammatory conditions. This article reviews the therapeutic relevance, mechanism, and clinical evidence of leech therapy in Sandhigata Vata/Osteoarthritis.

Keywords : -sandhigata vata, vata-dominant , Jalaukavacharana, Osteoarthritis``

Introduction

Sandhigata Vata is described in Ayurvedic texts as a condition where aggravated Vata lodges in the joints (Sandhi), leading to Shoola (pain), Shotha (swelling), and Hanti Sandhigata Gati (restricted movement) [1]. It closely correlates with osteoarthritis in modern medicine, which involves cartilage degeneration, synovial inflammation, and osteophyte formation [2].

Conventional management includes analgesics, NSAIDs, physiotherapy, and intra-articular injections, but long-term use may lead to adverse effects. Hence, complementary therapies like leech therapy have gained attention for their anti-inflammatory and analgesic effects.

Concept of Leech Therapy in Ayurveda

Jalaukavacharana is one of the Raktamokshana (bloodletting) procedures described in Sushruta Samhita. It is especially indicated in conditions involving Pitta and Rakta vitiation [3]. Leeches are considered “Anushastra” (non-instrumental surgical tools) because they remove impure blood without causing major tissue damage.

Mechanism of Action of Leech Therapy

The therapeutic effect of leech therapy is attributed to bioactive substances present in leech saliva, including:

- **Hirudin** – potent thrombin inhibitor, improves microcirculation
- **Calin** – inhibits platelet aggregation
- **Bdellins & Eglins** – anti-inflammatory and protease inhibitors
- **Hyaluronidase** – enhances tissue permeability
- **Vasodilators** – improve local blood flow [4]

Relevance in Osteoarthritis

In osteoarthritis, synovial inflammation and microcirculatory impairment contribute to pain and stiffness. Leech therapy helps by:

- Reducing local inflammation
- Improving joint microcirculation
- Decreasing venous congestion
- Providing analgesic effects through bioactive compounds [5]

Procedure of Jalaukavacharana⁶

Jalaukavacharana is a parasurgical procedure described in Sushruta Samhita under Raktamokshana (bloodletting therapy). It involves the application of medicinal leeches to remove vitiated blood and alleviate pain, inflammation, and swelling. The procedure is performed in three stages: Purva Karma (pre-operative measures), Pradhana Karma (main procedure), and Paschat Karma (post-operative measures).

1. Purva Karma (Pre-procedural Measures)

a. Patient Assessment

- Detailed clinical examination of the patient.
- Assessment of Dosha involvement, disease severity, and suitability for leech therapy.
- Exclusion of contraindications such as severe anemia, bleeding disorders, and active infections.

b. Selection and Preparation of Leech

- Healthy, active, non-poisonous medicinal leeches are selected.
- Leeches are purified by keeping them in clean water and washing them before application.

c. Preparation of the Site

- The affected area is cleaned with sterile water or antiseptic solution.
- If necessary, mild rubbing or pricking is done to facilitate attachment of the leech.

2. Pradhana Karma (Main Procedure)

a. Application of Leech

- The leech is gently placed on the affected site.
- Once attached, it begins sucking blood from the area.

b. Bloodletting Phase

- During feeding, the leech secretes saliva containing biologically active substances such as hirudin, bdellins, and eglins.
- These substances help reduce inflammation, improve circulation, and provide analgesic effects.
- The leech continues feeding until it becomes fully engorged.

c. Detachment of Leech

- Usually, the leech detaches spontaneously after adequate blood sucking.
- If removal is required, a small amount of turmeric powder or rock salt may be applied near its mouth.

3. Paschat Karma (Post-procedural Measures)

a. Wound Care

- The bite site is cleaned and dressed with sterile gauze.
- Mild bleeding may continue for a short period due to the anticoagulant effect of leech saliva.

b. Care of the Leech

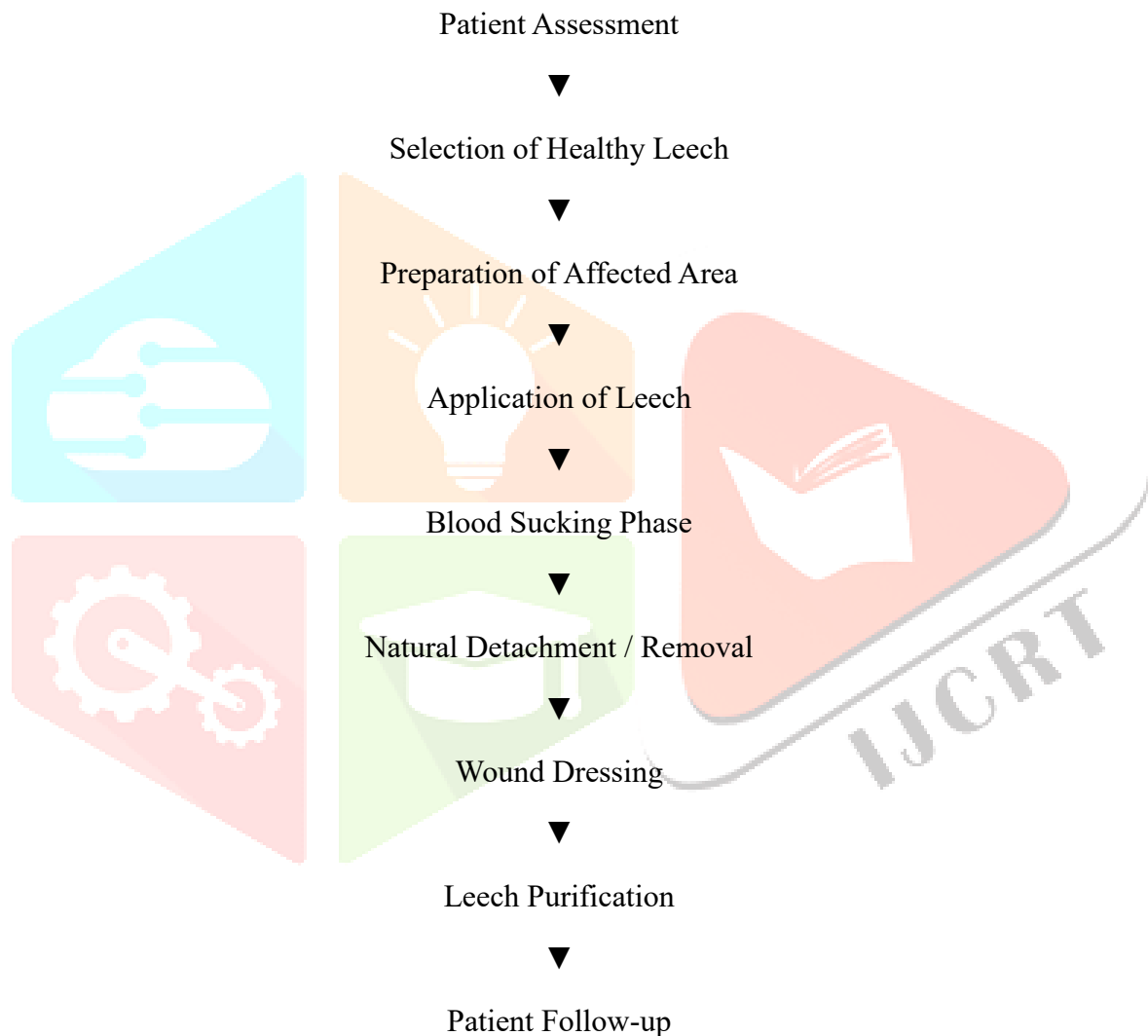
- The leech is induced to expel ingested blood by applying turmeric powder and gently squeezing its body.

- It is then washed thoroughly and stored in fresh water for future use according to standard protocols.

c. Follow-up

- The patient is observed for bleeding, infection, allergic reactions, or discomfort.
- Improvement in pain, swelling, tenderness, and joint mobility is assessed during subsequent visits.

Flowchart of Jalaukavacharana



Outcome in Sandhigata Vata (Osteoarthritis)

Jalaukavacharana helps in:

- Reduction of pain (Shoola)
- Decrease in swelling (Shotha)
- Improvement in joint mobility
- Enhancement of local blood circulation
- Reduction of inflammation associated with Osteoarthritis and Sandhigata Vata.

Clinical Evidence in Osteoarthritis

Several clinical studies have reported beneficial effects of leech therapy in knee osteoarthritis:

- Significant reduction in pain scores (VAS scale)
- Improvement in joint function (WOMAC index)
- Long-lasting analgesic effect compared to topical NSAIDs

Randomized controlled trials suggest that a single session of leech therapy can provide pain relief lasting up to several weeks in knee osteoarthritis patients ^[7].

DISCUSSION

Sandhigata Vata is one of the most common Vatavyadhi described in Ayurveda and is characterized by pain (Shoola), swelling (Shotha), crepitus (Atopa), stiffness, and restricted joint movement. Clinically, it closely resembles Osteoarthritis, which is characterized by progressive degeneration of articular cartilage, subchondral bone remodeling, synovial inflammation, and functional disability. The increasing prevalence of osteoarthritis among the elderly population has created a need for safe and effective therapeutic approaches. Jalaukavacharana (leech therapy) is one such Ayurvedic intervention that has shown promising results in managing pain and inflammation associated with osteoarthritis.

According to Ayurvedic principles, Sandhigata Vata develops due to aggravation of Vata Dosha caused by factors such as excessive physical activity, intake of dry and cold food, aging (Jara), trauma, and depletion of body tissues (Dhatu Kshaya). Aggravated Vata localizes in structurally weak joints (Khavaigunya) and produces symptoms such as pain, stiffness, and restriction of movement. Since aging is considered a natural cause of Vata predominance, degenerative disorders like Sandhigata Vata become increasingly common in older individuals. This Ayurvedic understanding closely parallels the modern concept of age-related degeneration of cartilage and reduction in synovial lubrication observed in osteoarthritis.⁸

Jalaukavacharana is included under Raktamokshana therapy in the Sushruta Samhita and is considered particularly useful in conditions involving localized pain, inflammation, and vitiation of Rakta. Although Sandhigata Vata is primarily a Vata disorder, chronic inflammation around the joint may involve Rakta Dushti, making leech therapy beneficial. By removing a small quantity of vitiated blood and introducing therapeutic salivary secretions into the affected area, leech therapy helps restore local tissue homeostasis.⁹

The therapeutic efficacy of leech therapy can be explained through both Ayurvedic and modern scientific perspectives. During feeding, medicinal leeches release numerous biologically active substances into the surrounding tissues. Among these, hirudin is the most studied compound and acts as a potent thrombin inhibitor. Hirudin prevents blood coagulation and improves local microcirculation. Improved blood flow enhances oxygen delivery and removal of inflammatory mediators from affected tissues. Other salivary components such as calin, bdellins, eglins, destabilase, and hyaluronidase contribute to anti-inflammatory, analgesic, and antithrombotic effects.¹⁰

The anti-inflammatory activity of leech saliva is particularly relevant in osteoarthritis. Modern research has demonstrated that inflammatory cytokines such as interleukin-1 β (IL-1 β), tumor necrosis factor-alpha (TNF- α), and various matrix metalloproteinases play a crucial role in cartilage destruction and pain generation. Bioactive substances present in leech saliva inhibit inflammatory pathways and reduce tissue edema, thereby decreasing pain and improving joint function. This mechanism may explain the rapid symptomatic relief frequently observed after Jalaukavacharana.¹¹

Pain reduction is one of the most significant outcomes reported with leech therapy. In Ayurveda, pain is considered the cardinal manifestation of aggravated Vata. The removal of vitiated blood combined with the analgesic properties of leech saliva helps alleviate pain at the local level. Several studies have reported substantial reductions in Visual Analog Scale (VAS) pain scores following leech application. Improvement in pain subsequently enhances mobility and quality of life in patients suffering from osteoarthritis.¹²

A landmark randomized controlled trial conducted by Michalsen et al. demonstrated that a single session of leech therapy produced significant improvement in pain and functional status among patients with knee osteoarthritis compared with conventional treatment. The benefits were observed within a few days and persisted for several weeks. The study suggested that leech therapy may serve as an effective complementary treatment option for patients who experience inadequate relief or adverse effects from long-term NSAID use.¹³

Another important aspect of Jalaukavacharana is its effect on local circulation. In degenerative joint diseases, reduced microcirculation contributes to tissue hypoxia and accumulation of inflammatory metabolites. The anticoagulant and vasodilatory actions of hirudin and other salivary constituents improve local blood perfusion. Enhanced circulation supports tissue nutrition and may contribute to improved joint function. From an Ayurvedic perspective, this can be interpreted as the restoration of normal Vata movement and reduction of Srotorodha (obstruction of channels).¹⁴

Leech therapy also possesses advantages over conventional pharmacological treatment. Long-term administration of NSAIDs may cause gastrointestinal irritation, renal dysfunction, cardiovascular complications, and drug dependency. In contrast, Jalaukavacharana is a localized procedure with relatively fewer systemic adverse effects when performed under proper aseptic conditions. This makes it particularly valuable in elderly patients who often have multiple comorbidities and are already receiving several medications.¹⁵

Despite its therapeutic potential, certain limitations must be acknowledged. The procedure requires trained personnel and strict aseptic precautions. Adverse effects such as prolonged bleeding, local infection, itching, allergic reactions, and rarely anemia may occur if the procedure is not performed appropriately. Furthermore, most available clinical studies involve small sample sizes, and standardized treatment protocols are still lacking. Additional multicentric randomized controlled trials are required to establish definitive evidence regarding efficacy, dosage, frequency, and long-term outcomes.

Overall, the available Ayurvedic literature and modern scientific evidence suggest that Jalaukavacharana is an effective and safe adjunctive therapy for Sandhigata Vata/Osteoarthritis. Its multimodal actions, including anti-inflammatory, analgesic, anticoagulant, and microcirculatory effects, address several pathological aspects of the disease simultaneously. Therefore, Jalaukavacharana may be considered a valuable integrative approach in the management of osteoarthritis, particularly for reducing pain and improving functional capacity.

Conclusion

Leech therapy (Jalaukavacharana) is an effective traditional intervention for managing Sandhigata Vata, showing significant therapeutic potential in osteoarthritis. Its bioactive salivary compounds provide anti-inflammatory and analgesic effects, supporting its role as a complementary therapy. Further large-scale randomized clinical trials are required to establish standardized protocols and long-term efficacy.

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