

## EFFECTIVENESS OF LEECH THERAPY (JALAUKAVACHARANA) IN POST-TRAUMATIC CHRONIC SYNOVITIS OF KNEE: A CASE STUDY

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### ABSTRACT

The knee joint, recognized as a complex anatomical structure, is the most frequently injured articulation in the human body. Traumatic events can lead to damage in the soft tissues, such as ligaments, or the osseous components within the joint, often culminating in the condition of inflammatory synovitis. This article presents a detailed account of an identified case of post-traumatic chronic inflammatory synovitis of a 52 years old male patient who was treated with allopathy medications including Ibuprofen at a dosage of 400 mg twice daily, Naproxen at 250 mg twice daily, and Diclofenac gel 1% for local application for a duration of two months but not got any relieve in symptoms. Later patient came with presenting complaints of significant swelling localized to the left knee joint, pain during ambulation, restricted range of motion in the

affected joint to OPD Dept of Shalya Tantra, PTKLS Bhopal for further treatment. Leech therapy was provided to the patient and signs and symptoms were assessed before and after the treatment. The leech therapy was found to be the ultimate choice of treatment for relieving symptoms and pain reduction, thus effective in trigeminal neuralgia. The therapeutic strategy was meticulously designed by integrating the principles of *Janu Sandhi*

*Marmaghata* pathophysiology, specifically addressing the afflicted Sandhi Marma (vital joint point). Symptomatic relief was also a significant consideration in the planning phase. Objective improvements across critical metrics—including range of motion, knee joint circumference, ambulation capacity (walking distance), and the Visual Analog Scale (VAS) score—were registered within a seven-day period. Furthermore, the absence of disease recurrence was confirmed one year post-cessation of the medication regimen. This leech therapy Ayurvedic therapeutic protocol is thus demonstrated to be a safe and efficacious intervention, offering accelerated healing and superior long-term clinical outcomes.

**KEYWORDS:** Leech therapy, Synovitis of knee, Janu sandhi *marmaghata*.

## INTRODUCTION

The knee joint is acknowledged as one of the body's largest and most intricate articulations. Structurally, it is a composite synovial hinge joint, encompassing two condylar articulations between the femur and the tibia, and a saddle joint between the femur and the patella. Its stability is derived from an elaborate network of reinforcing structures, including the collateral and cruciate ligaments, the fibrous capsule, the patellar ligaments, and the menisci, all surrounded by numerous bursae. Functionally, it is crucial for locomotion, permitting primary movements of flexion and extension, in addition to a limited degree of rotation. Muscles such as the quadriceps femoris, hamstrings, gastrocnemius, and popliteus are integral to its mechanics. Despite being the body's largest joint, the knee is considered structurally weak; its stability is critically dependent on the integrity of the cruciate and collateral ligaments and the iliotibial tract. Consequently, it is highly susceptible to a range of pathologies, including osteoarthritis, accidental injuries to the collateral and cruciate ligaments, and various overuse syndromes.<sup>[1]</sup>

The Knee Joint in Ayurvedic Context: Janu Sandhi Marma-In the classical texts of Ayurveda, the knee joint is termed *Janu Sandhi* (knee joint). Acharyas like *Vagbhata* and *Sushruta* specifically categorize it as a *Marma* (a vital point), designating it as *Janu Marma*. This vital point is believed to be a structural confluence of five essential tissues (*Panchaka Dravyas*): *Sira* (vessels), *Snayu* (ligaments/tendons), *Asthi* (bone), and *Sandhi* (joint). Critically, Janu Marma falls under the category of a *Vaikalyaka Marma* (Disabling Marma) and a *Sandhi Marma* (Joint Marma).<sup>[2]</sup> Trauma to this *Marma* is classically associated with *Khanjatva* (limping or lameness), manifesting as a gait deformity and impaired lower limb function.<sup>[3]</sup>

Pathophysiological Link between Trauma and Synovitis-Given its designation as a *Marma Sthana* (site of vital energy), the knee joint is considered a locus *where Prana* (life force) resides.<sup>[4]</sup> Any physical trauma to this vital area instigates the vitiation of *Vata Dosha*, the bio-energy responsible for movement and neurological function. Furthermore, as a joint (*Sandhi*), it is also the anatomical seat of *Shleshaka Kapha*, the sub-dosha responsible for lubrication and joint strength. The consequent vitiation of both *Vata* and *Kapha Doshas* leads to a cascade of symptomatic manifestations, including localized pain (*Shoola*), swelling (*Shotha*), and stiffness.

This paper presents a clinical demonstration of how a case of post-traumatic chronic inflammatory synovitis of the knee joint was successfully managed by applying leech therapy as a comprehensive Ayurvedic therapeutic approach, carefully integrating these principles from both Ayurvedic and modern medical sciences.<sup>[5]</sup>

### **Patient Demographics and Initial Presentation**

The patient is a 54-year-old male who presented to the OPD walking with difficulty, requiring the use of family assistance for sitting. He carried a diagnosis of persistent inflammatory synovitis. The patient reported receiving consistent allopathic medical care for the preceding year, involving frequent consultations and treatment.

### **History of Presenting Illness and Chief Complaints**

Despite the year-long allopathic treatment, the patient experienced only minimal clinical improvement. Consequently, he discontinued the prescribed medication and elected to pursue Ayurvedic therapy.

His primary presenting complaints, enduring for one year, included

- Significant swelling localized to the left knee joint.
- Pain during ambulation.
- Restricted range of motion in the affected joint.

### **Etiological History**

The onset of symptoms was directly correlated with a traumatic event one year prior. The mechanism of injury involved a torsional strain to the knee joint due to fall, ultimately resulting in the patient falling.<sup>[6]</sup>

### Concurrent Medical History

The patient's general health status was reported as excellent, with no concurrent systemic illnesses identified. Specifically, there was no history of significant infectious diseases (e.g., tuberculosis), neurological disorders (e.g., epilepsy), or metabolic conditions (e.g., diabetes mellitus).

### Pharmacological History

Over the past year, the patient's pharmacologic regimen included regular consumption of analgesics, anti-inflammatory drugs, and calcium supplementation.<sup>[7]</sup>

### Physical and Local Examination Findings

#### General Examination

The patient's vital signs were stable and within normal limits:

- Blood Pressure (Sitting): 120/80 mm of Hg
- Pulse Rate: 88 beats/min

#### Local Examination (Left Knee Joint)

- Inspection revealed pronounced swelling in the left knee joint compared to the contralateral (right) knee.
- Musculature: Observable disuse atrophy was noted in the left quadriceps and hamstring muscle groups.
- Tenderness: Palpation elicited moderate tenderness, quantified at a Grade 2 level.
- Joint Movement:
- Pain was manifest during passive mobilization.
- The maximal achievable flexion was severely limited to only 30°. Full extension could not be achieved, even passively.

Pain Assessment: The patient's subjective pain level, measured on the Visual Analog Scale (VAS), was recorded as 8 out of 10. The patient's general health status was reported as excellent, with no concurrent systemic illnesses identified. Specifically, there was no history of significant infectious diseases (e.g., tuberculosis), neurological disorders (e.g., epilepsy), or metabolic conditions (e.g., diabetes mellitus).

### NIDANA PANCHAK

- *Nidana* (Causative Factor)- *Abhighata* (Trauma) The specific injury due to fall.

- *Samprapti* (Pathogenesis)- *Dosha: Vata, Pitta, and Kapha* Involvement of all three regulatory factors.
- *Dushya: Rakta* (Blood tissue) and *Mamsa* (Muscle tissue) Tissues primarily affected by inflammation and injury.
- *Agni: Mandagni* (Diminished Digestive Fire) Indicating impaired metabolism leading to *Ama*.
- *Ama: Jatharagni* and *Dhatvagni Janya* Toxins originating from both gross and tissue-level metabolism.
- *Strotasa* (Channels): *Raktavaha* and *Mamsavaha* Channels related to circulation and muscle integrity are affected.
- *Adhithana* (Site): *Janu* (Knee Joint) The localized site of the pathology.
- *Rogamarga* (Disease Pathway): *Bahya* (External) Pathology manifesting in the musculoskeletal system.
- *Vyadhi Swabhava* (Nature): *Chirakari* (Chronic) The condition has persisted for one year.
- *Sadhyasadyata* (Prognosis): *Kricchrasadhya* (Difficult to Treat) Indicating a challenging but manageable condition.
- *Roopa* (Signs & Symptoms) *Shotha* (Swelling), *Ruja* (Pain), *Khanjata* (Altered gait), *Balahani* (Weakness) The symptomatic manifestation of the disease.
- *Upashaya* (Alleviating Factors) *Bahya Ushna Sparsha* and *Abhyanga* Improvement upon warm sponging and oil application.
- *Anupashaya* (Aggravating Factors) *Sheeta Sparsha* Increased symptoms when exposed to cold climate/touch.

### ***Ashtavidha Pariksha***

The standard eight-point Ayurvedic examination revealed the following key observations:

- *Nadi* (Pulse): *Vata-Pitta* predominant constitution.
- *Mala* (Stool): Dense and sticky consistency (*Sandra-picchila*); bowel habits were regular.
- *Mutra* (Urine): Normal (*Prakrita*).
- *Jivha* (Tongue): Coated (*Sama*), indicating the presence of *Ama* (metabolic toxins).
- *Shabda* (Voice/Speech): Normal (*Prakrita*).
- *Sparsha* (Touch/Skin): Rough (*Ruksha*).
- *Drik* (Vision): Normal (*Prakrita*).
- *Aakriti* (Physique): Medium built (*Madhyam*).

### Modern Diagnostic Focus

The clinical evaluation was supplemented by imaging and laboratory investigations to exclude structural and systemic pathologies.

X-ray (Left Knee): Revealed no significant bony pathology, effectively ruling out fracture or severe degenerative changes.

MRI (Left Knee): Confirmed generalized synovitis, suggesting an inflammatory or infectious process.

### Laboratory Tests

Complete Blood Count (CBC): Within the normal reference range, mitigating the likelihood of an acute infectious pathology. Hb- 10.08 gm/dl, Packed cell volume- 36.60% ,RBC- 5.14 mill/mm<sup>3</sup> , RDW- 18.90% , BT- 4.5 mins ,CT- 5 mins ,HIV- non reactive HbsAg – non reactive.

C-Reactive Protein (CRP) and Rheumatoid Arthritis (RA) Factor: Both were within normal limits, reducing suspicion of systemic inflammatory or autoimmune arthritis.

**Final Diagnosis:** Based on the clinical history and investigative findings, the case was definitively diagnosed as post-traumatic chronic inflammatory synovitis of the left knee.

### Therapeutic Rationale: Janu Sandhi Marmaghata

- The treatment approach was strategically anchored on the Ayurvedic concept of *Janu Sandhi Marmaghata* (affliction to the knee joint vital point):
- *Marma* Significance: The *Janu* is classified as both a *Sandhi Marma* (joint vital point) and a *Vaikalyakara Marma* (disabling vital point).
- *Vata Vitiating*: Trauma (*Abhigata*) causes immediate vitiation of Vata Dosha at this Marma, which subsequently leads to *Khanjata* (altered gait/limping), likely through secondary damage to supporting soft tissues such as collateral and cruciate ligaments.
- Symptom Manifestation: This *Vata* aggravation is the primary cause of *Ruja* (pain) and localized inflammation.
- *Kapha Vitiating*: The injury also vitiates *Shleshaka Kapha*, the lubricating factor residing in the joint, resulting in *Sandhi Shotha* (joint swelling).

### Therapeutic Focus

Consent : A Informed written consent was taken from the patient before treatment.

Leech therapy was planned in 7 days of interval for relief in symptoms .

Leech Therapy was done on 11/0/202 on left knee after all the essential blood investigations like CBC, Clotting time, Bleeding time, HIV, HBsAg, HbA1c(6.2) and all the findings were normal. After 1st sitting of this therapy there was 50% relief which was graded as five according to VAS scale ( Visual Analog Scale) of pain and patient didn't get attack until next sitting however, oral medications continued.

Next 2nd sitting was done on 18/06/2024 and after which there was 80% reduction in symptoms graded as two according to VAS scale ( Visual Analog Scale).

3rd sitting was done after 7 days and the patient got complete relief in symptoms of pain as graded zero over VAS ( Visual Analog Scale).

#### **Therapeutic Intervention and Timeline Protocol : Table no. 1.**

Sitting no.	Interval	No. of Sitzings of leech		Site
		Procedure	Duration	
1.	Leech Therapy	1 <sup>st</sup> sitting 11/06/2024	30 mins	Left knee
2.	Leech therapy	2 <sup>nd</sup> sitting	30 mins	Left knee
3.	Leech therapy	3 <sup>rd</sup> sitting	30 mins	Left knee

#### **Leech Therapy Procedure**

The patient was positioned supine, and a site of pronounced discomfort on the left side of the knee was meticulously selected. The area was cleansed with a Betadine solution. One leech was strategically selected. and placed on the left knee. The leech was subsequently enveloped with soft, moist cotton. The leech engaged in the extraction of impure blood, exhibiting a movement reminiscent of '*ashwakhurvati*' (the hoof of a horse). Upon the patient's sensation of pruritus in the affected region, it was inferred that the leech was extracting pure blood; thus, it was removed by gently sprinkling turmeric powder over its mouth.<sup>[9]</sup>

#### **Post therapy**

The area was again cleaned with cotton and sphaatik ( alum) bhasma was applied to stop bleeding after which bandaging was done.



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### Follow up and outcome

Follow-up assessments were conducted over a span of two months at weekly intervals. The patient experienced complete alleviation of pain. No episodes occurred during this period. The patient was advised to adhere to a balanced diet and engage in pranayama exercises. There was no recurrence of symptoms.

Joint Name	Left knee	Right knee
Swelling	Present	No
Crepitating	Present	No
Fluid	No	No
Redness	No	No
Angle of flexion	30	130
Angle of extension	20	0

### DISCUSSION

Chronic inflammatory synovitis of the knee joint is a condition characterized by persistent inflammation of the synovial membrane, leading to pain, swelling, and restricted joint mobility. In the present case, the condition developed following trauma (Abhighata), which is a well-recognized causative factor in both modern medicine and Ayurveda. Trauma initiates an inflammatory cascade in the synovial membrane, resulting in effusion, pain, and functional limitation of the joint.<sup>[10]</sup>

From an Ayurvedic perspective, the knee joint (Janu Sandhi) is considered a Marma Sthana, specifically a Sandhi Marma and Vaikalyakara Marma. Injury to this vital point leads to vitiation of Vata Dosha, which is primarily responsible for pain (Ruja) and impaired movement. Simultaneously, the involvement of Shleshaka Kapha results in Shotha (swelling)

and stiffness. The chronicity of the condition further indicates the presence of Ama and Tridosha involvement, as reflected in the Nidana Panchaka of the patient.

In this case, the patient did not respond adequately to prolonged conventional treatment with NSAIDs, which primarily provide symptomatic relief but may not address the underlying pathology effectively. This highlights the need for alternative therapeutic approaches that target both symptom relief and root cause.

Leech therapy (Jalaukavacharana), a form of Raktamokshana, has been described in Ayurvedic classics as an effective treatment for inflammatory and blood-related disorders. The therapeutic effect of leech therapy can be explained through both Ayurvedic and modern mechanisms. According to Ayurveda, it helps in the removal of vitiated Rakta and pacifies aggravated Vata and Kapha Dosha at the site of pathology, thereby reducing inflammation and pain.

From a modern scientific viewpoint, leech saliva contains several bioactive substances such as hirudin (anticoagulant), calin (platelet aggregation inhibitor), and destabilase (fibrinolytic agent). These substances contribute to improved local blood circulation, reduction of edema, and alleviation of pain. Additionally, the anti-inflammatory and analgesic properties of leech saliva play a crucial role in symptom relief.

The clinical outcome observed in this case was highly significant. There was a progressive reduction in pain as evidenced by the decrease in VAS score from 8 to 0 within three sittings. Swelling reduced markedly, and the range of motion improved substantially, enabling the patient to regain functional mobility. The rapid response to therapy within a short duration (three weeks) indicates the efficacy of leech therapy in managing inflammatory conditions.

Furthermore, the absence of recurrence during follow-up suggests that the therapy not only provided symptomatic relief but also contributed to long-term stabilization of the condition. This aligns with the Ayurvedic principle of treating the root cause (Samprapti Vighatana) rather than merely alleviating symptoms.<sup>[11]</sup>

However, as this is a single case study, the findings cannot be generalized without further large-scale clinical trials. Future studies with larger sample sizes and controlled designs are necessary to establish the efficacy and safety of leech therapy in synovitis and other musculoskeletal disorders.

## CONCLUSION

The present case study demonstrates that leech therapy (Jalaukavacharana) is an effective and safe therapeutic modality in the management of post-traumatic chronic inflammatory synovitis of the knee joint. The patient, who did not respond satisfactorily to prolonged conventional allopathic treatment, showed remarkable improvement following three sittings of leech therapy administered at weekly intervals.

Significant reduction in pain (VAS score from 8 to 0), decrease in swelling, and improvement in range of motion and functional mobility were observed within a short duration. The absence of recurrence during long-term follow-up further highlights the sustained benefits of this intervention.

From an Ayurvedic perspective, the therapy effectively addressed the vitiation of Vata and Kapha doshas at the Janu Sandhi Marma, thereby reducing Shotha (inflammation) and Ruja (pain). The bloodletting action of leech therapy, along with its anti-inflammatory and analgesic effects, contributed to rapid symptomatic relief and restoration of joint function.

Thus, leech therapy can be considered a valuable, minimally invasive, and cost-effective treatment option in cases of chronic synovitis, especially where conventional therapies fail to provide adequate relief.

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