

# Role of Ayurveda in the management of Post-traumatic chronic inflammatory synovitis of knee joint - A Case Report

## Case Report

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### Abstract

Knee is a complex joint. It is the most commonly injured joint in the body. Trauma may injure soft tissues such as ligaments or bones of the joint. Inflammatory synovitis is one of the conditions developed after trauma. This article encompasses a diagnosed case of Post traumatic chronic inflammatory synovitis. Treatment protocol was opted considering its *samprapti* (Pathophysiology) as *janu sandhi marmaghata*. Treatment was planned considering *Sandhi marmaghata*. Symptomatic treatment was also considered. Significant improvement was observed in parameters like range of motion, knee joint circumference, walking distance and VAS scale within a week. No recurrence observed even after 1 year of suspended treatment. This multimodular *Ayurveda* treatment appears to be safe and efficient for early recovery and better outcomes.

**Key Words:** *Inflammatory synovitis, Sandhi marma, Knee joint, Panchakarma.*

### Introduction

The Knee Joint is one of the largest and complex joints in the body. It is compound joint with two condylar joints between femur and tibia and one saddle Joint between femur and patella. It is hinge synovial joint. It is strengthened by collateral ligaments and cruciate ligaments. Also, this joint is supported by number of ligaments including fibrous capsule, ligaments patellae, menisci. It is surrounded by bursae. This joint is related with quadriceps femoris, hamstring, popliteus, gastrocnemius. Being the hinge joint the chief movements are flexion and extension and rotatory movements of a negligible range. Knee joint is a largest but structurally weak joint and stability is maintained by cruciate ligaments and collateral ligaments and iliotibial tract. The common diseases of knee joint are osteoarthritis, injury to cruciate ligaments, collateral ligaments due to accident and overuse (1).

In Ayurved scriptures knee joint is considered as *Janu sandhi*. Both Sushruta & Vagbhata explained *Janu marma*. It is considered to be the combination of *Sira, Snayu, Asthi & Sandhi*. It is included in *sandhi marma* and *vaikalyakar*(Disabling)*marma* (2). Injury to this *marma* leads to *Khanjatva* that is deformity and altered gait, limping of lower limb (3). Trauma to this joint may

lead to Ligament injury, Meniscus injury, Tendon injury or Fracture.

As the knee joint is *marma sthana*, *Prana* resides there(4). Any injury to this marma causes the vitiation of *Vata dosha*. Also as it is a joint (*sandhi*) it is a seat of *Shleshaka kapha*, which lubricates and give strength to the joint. Due to vitiation of *vata* and *kapha*, there develops pain, swelling, stiffness etc.

Considering these aspects of Ayurveda and modern science, here is a case of post traumatic chronic inflammatory synovitis of knee joint treated successfully with Ayurveda management.

### Case report

#### Patient information

A27 year old female patient visited Shalyatantra OPD with crutches in hand and limping gait. She sat on stool with the help of relatives. She was a diagnosed case of chronic Inflammatory synovitis. She was under allopathic treatment for last 1 year with regular follow-ups. Her general health was good. There was no associated concomitant illness. However due to insignificant improvement, the patient discontinued allopathic treatment and consulted for Ayurveda treatment.

#### Chief complaints

Left knee joint marked swelling, pain on walking, restricted movements of the same joint, assisted walking for 1 year were the chief complaints.

#### History

There was history of trauma 1 year ago.

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Mechanism of trauma – while doing ice skating, when she attempted to keep her balance and resisted to fall, twisting of knee occurred and she fell down.

There was no history of any major illness like Tuberculosis, Epilepsy, Diabetes mellitus.

### Drug history

She was on Analgesics, anti-inflammatory and calcium supplements since last 1 year.

### General Examination

On general examination her vitals were stable (BP- 110/80mm of Hg in sitting position, pulse- 88/min, regular in rhythm, normal volume)

### Local examination

On local examination there was significant swelling on left knee as compared to right knee. Quadriceps, hamstring muscles showed disuse atrophy on left. Tenderness was moderate and graded as 2. On passive movements, there was pain and flexion limited to 30°. Full extension was not possible even passively. VAS scale was 8 score.

### Ashtvidh Pariksha

*Nadi* (pulse) – *VatPittaja*; *Mala* (stool)– *Sandra-picchila*, Bowel habit was regular; *Mutra* (urine) – *Prakrita*; *Jivha* (tongue)– *Sama* (coated); *Shabda* – *Prakrita*; *Sparsha* (touch)–*Ruksha*; *Drika* (vision) – *Prakrita*; *Aakriti* – *Madhyam* (medium built)

### Nidan Panchak

- *Nidana* – *Abhighat* (Trauma)
- *Samprapti* – *Dosha* – *Vat*, *Pitta* and *Kapha* ; *Dushya* – *Raktadhatu* and *Mamsadhatu*; *Agni* – *Mandagni*;
- *Aam* – *Jatharagni* and *Dhatvagni janya*; *Strotasa* – *Raktavaha* and *Mamsavaha*; *Adhisthana* – *Janu*;
- *Rogamarga* – *Bahya*;
- *Vyadhi Swabhava* – *Chirakari* (chronic);
- *Sadhyasadyata* – *Kricchrasadhya* (difficult to treat);
- *Roopa*: *Shotha*(Swelling of left knee), *Ruja* (Pain in left knee), *Khanjata* (Altered gait),
- *Balahani* (generalized weakness);
- *Upashaya* – *Bahya ushna sparsha* and *abhyang* (improvement on warm sponging and oil application);
- *Anupashaya* – *Sheeta sparsha* (increased symptoms on work in cold climate).

### Diagnostic focus

X-ray left knee showed no significant bony pathology.

MRI left knee showed diffuse synovitis likely to be inflammatory/ infective synovitis. Her CBC was done to rule out infective pathology if any. It was within normal limit. Other blood parameters like CRP, RA factor were within normal limit.

Considering history, clinical examination finding the case was diagnosed as post traumatic chronic inflammatory synovitis of left knee and decided to treat with Ayurveda medication and basti upakrama.

### Therapeutic relevance

- Considering this as *janu sandhi marmaghat* -
- *Janu* is a *sandhi marma* and *Vaikalyakara marma* (Disabling)
- This *janu marma* when get traumatized *vata dosha* gets vitiated, it produce *Khanjatva* (Altered gait). This may be due to injury to surrounding soft tissues like ligaments (Collaterals, cruciate).
- This injury results in local inflammation.
- *Vata* produces *ruja* (Pain). As *sandhi* (Joints) is site of *Shleshak kapha*, due to injury this *kapha* also gets vitiated and results in *sandhi shotha* (Swelling)

Treatment was aimed at-

- *Vatakapha shaman*
- To correct *Kha vaigunya* (weakness at knee joint due to trauma) Strengthening soft tissues and bones.
- To correct *rakt dushti*, which take place after any trauma.
- To alleviate pain and swelling.
- To improve movements of knee joint for better quality life.

### Therapeutic focus and assessment

After obtaining written informed consent, considering samata , Initial deepana and pachana was given for 3 days. As soon as Niram avastha was noticed, the patient was advised Anuvasan basti with Sahachar tail 60 ml for 5 days. After the signs of snehana seen, she was switched on to Panchtiktsheer basti for 15 days. 5<sup>th</sup> day onwards she was advised *sthanik snehana*( *kati Pradesh and ubhaya adho shakha*)with *bala tail* and *nadi sweda* with *dashamool kwath*.

*Janu basti* with *shatavari tail* was given for 7 days. Simultaneously oral medications like *Yogaraj guggul* 250 mg twice daily, *Ashwagandha ghan vati* twice daily, *Kushmand awaleha* 1 tsf BD, *Rasnasaptak kwath* 30 ml twice daily, *Dashamool Ghan vati* 1 tab thrice daily and *Anulomak Vati* 2 tablets at night advised with this management her pain while walking and range of flexion and extension was improved.

**Table 1: Timeline**

Date	Plan	Medicine	Dose	Duration in days
13/2/2021	<i>Deepan Pachan</i>	<i>Aampachak Vati</i> 250 mg	2 tab TDS	3 days
16/2/2021	<i>Anuvasan Basti</i> and	<i>Sahachar tail</i>	60 ml	5 days
16/2/2021	<i>Sthanik snehana</i> and <i>mridu swedan</i>	<i>Bala tail Dashamool Kwath</i>	-	Daily
16/2/2021	<i>Janu Basti</i>	<i>Shatavari Tail</i>	-	7 days
19/2/2021	<i>Leech Application</i>	-	-	1 <sup>st</sup> sitting, then Weekly once
21/2/2021	<i>Yapana Basti</i>	<i>Panchtiktsheer basti</i>	250 ml	15 days

**Table 2: Therapeutic Regime**

Sr. No.	Formulation	Dose, frequency	Adjuvant	Duration
1	<i>Yogaraj guggul</i>	250 mg twice daily	With Luke warm water	Daily for 15 days
2	<i>Ashwagandha ghan vati</i>	250 mg twice daily	With Luke warm water	Daily for 15 days
3	<i>Kushmand awaleha</i>	1 tsf twice daily	With Luke warm water	Daily for 15 days
4	<i>Rasnasaptak kwath</i>	30 ml twice daily	-	Daily for 15 days
5	<i>Dashamool Ghan vati</i>	250 mg Thrice daily	With Luke warm water	Daily for 15 days
6	<i>Anulomak Vati</i>	250 mg , 2 Tab. H.S.	With water	Daily for 15 days

**Table 3: Local Examination of Bilateral Knee- Before treatment**

Joint Name	Right Knee joint	Left Knee joint
Local temperature	Normal	Raised
Swelling	No	++
Crepitation	No	Present
Redness(Rubor)	No	No
Fluid	No	No
Angle of flexion	130	30
Angle of extension	0	20

### Follow up and outcome of treatment

The treatment was planned considering the condition as a *Janu sandhi marmaghat* as there was limping gait (*khanjatva*), swelling (*Shotha*), Pain (*Ruja*). Treatment focus was *vata shaman* along with *shothahar*, strength promoting (*balya*) *chikitsa*. Accordingly oral medication was chosen and *panchkarma* was planned.

Assessment was done weekly and final assessment was done on 7<sup>th</sup> week.

**Table 4: Overall improvement in subjective and objective parameters**

Parameter	Before treatment		1 week		3 <sup>rd</sup> week		5 <sup>th</sup> week		After treatment(7 <sup>th</sup> week)	
Gait	Limping		Limping		Mild improvement		Moderately improved		Normal gait	
Walking	Assisted with crutches		Assisted with crutches		Assisted with crutches		Intermittent assistance		Without assistance	
1m Walk	With moderate pain in left knee		With moderate pain in left knee		With mild pain		Without pain		Without pain	
VAS score	8		8		5		1		1	
Knee circumference (in cm.)	Right knee 35 cm	Left knee 48 cm	Right knee 35cm	Left knee 45	Right knee 35 cm	Left knee 42 cm	Right knee 35 cm	Left knee 38 cm	Right knee 35 cm	Left knee 36 cm
Left knee flexion (Degree)	30		45		60		95		130	
Left knee extension lag (Degree)	100		80		40		20		0	

## Discussion

The present case scenario is of *janu sandhi marmaghat* i.e. post traumatic chronic inflammatory synovitis of left knee. The treatment modalities included

### 1. Oral medication

- Yogaraj guggul* 250 mg twice daily,
- Ashwagandha ghan vati* twice daily,
- Kushmand awaleha* 1 tsf BD,
- Rasnasaptak kwath* 30 ml twice daily,
- Dashamool Ghan vati* 1 tab thrice daily
- Anulomak Vati* 2 tablets At night

### 2. Panchakarma

*Matra basti* - with *Sahachar tail* 60 ml after lunch for 5 days with *basti dharan kal* -3 hours  
 From 6<sup>th</sup> day onwards *Panchtikts ksheerbasti*- 250 ml for 15 days with *basti dharan kal* - 1 hour.

### 3. Leech application

- 2 leeches applied at a time at most tender and swollen part of left knee.
- Duration of leech application- once a week for 7 weeks.
- Color of blood vomited by leech- Dark colored, Pungent smell

### 4. Physiotherapy

#### Discussion on Mode of action of Oral medicines

##### *Yograj guggul* (5)

This alleviates all the three *doshas*, acts as *rasayana* and effective in all types of *vata vyadhi*. This alleviates Pain and improves movement of joints and muscles. Rejuvenates and strengthens the skeletal and neuromuscular system. Pacifies *Vata* in nerves, muscles and joints, supports healthy immune system.

### **Ashwagandha Ghanavati (6)**

Ashwagandha is Tikta Rasa(bitter taste), Rasayan (rejuvenator) and Balya (strengthening) which helps to treat degenerative changes of bony tissue and also consist of Cox-2 enzyme which helps in relieving pain. It is also thought to have some anti-inflammatory properties. It is effectively tried in various arthritis conditions. So it was found effective in this particular case as anti-inflammatory and strengthening of muscles and bones.

### **Kushmand awaleha (7)**

It is indicated in Kshaya(Deprivation), Shosha(emaciation). It is an aphrodisiac and builds the body and strengthens it. In this case as there was muscle wasting and weakness of lower limb skeletal muscles this awaleha found much effective.

### **Rasnasaptak kwath(8)**

As per textual reference in Sharangadhar Samhita, this kwatha is indicated to cure pain in Jangha(Calves), Kati(waist), Prishtha(back), Uru(Thighs). So this kwath was used in this particular case and it relieved pain while walking.

### **Anulomak Vati and Dashamool Ghan vati**

Both used for vatanuloman and vatsashaman respectively which relieved pain and acted synergistically with rasnasaptak kwatha.

### **Discussion on Panchakarma**

#### **Reason for selection of Basti Upakrama**

Vata dosha Prakopa is the main pathology behind the condition. When Vata gets exceedingly aggravated, there is no remedy other than Basti for its alleviation. Basti is well known for the definitive therapy to treat the vitiated Vata and Vatapradhana Vyadhies (9)

Basti removes Mala, Pitta, and Kapha and does Vatanulomana to relieve the disorders situated in all over the body. Basti performs various actions such

as Samshodhana, Samshamana, Samgrahana, Vajeeekarana, Brumhana, Karshana, Chakshush ya, and Vayahsthapana. Basti is "Param Vatahara," and as Vata is the causative factor of Shool in Janu Sandhi; hence, here Basti Chikitsa was opted.

In this clinical condition, Sandhi shool(Joint pain), Ruja(Pain) and Stabdhta(Stiffness) are observed, and according to Ayurvedic classics, Basti is advocated in Shakhagata Vyadhies and in patients having Stambha(Stiffness), Sankocha(Atrophy), pain, severe constipation, fracture, etc.(10)

Here clear involvement of Asthi- majja vaha srotas can be considered. Ksheer basti is considered as the main line of management in Asthigata Roga by Acharya Charaka. The Basti, which has Milk or Ksheer as the main ingredient is known as Ksheer basti.

Ksheera is the ingredient which can be used in the Basti preparation as per the condition and Dosha involvement. As per the quantity of this Basti and use of Ksheera as a main ingredient, Ksheera Basti serves twin function, i.e., Niruha and Anuvasana; hence, it acts as

Shodhana as well as Snehana. Ksheera Basti relieves the Margavarodha(Obstruction in path of Dosha) and produces Brihana(improve nutritional level) effect. In this study, panchtikta

Ksheera Basti is used as Yapana Basti continuously for 15 days.

The rectum has rich blood and lymph supply, and drugs can cross the rectal mucosa such as other lipid membrane. Thus, unionized and lipid-soluble substances are readily absorbed from the rectal mucosa. In Basti Karma, a homogeneous emulsion of Honey, Saindhava, Sneha Dravya, Kalka, and decoction mixed in remarkable combination after proper churning may break the large chain fatty acid to small chain fatty acids. This mixture given facilitates absorption more efficiently.

Initial selection of panchakarma was aimed at Vatashaman, so Anuvasana basti with Sahachar tail was used. It is found to pacify katigata vata (lower back) and hence relived pain in back and lower limbs.

### **Discussion on Janu basti**

Janu basti with Shatavari tail with prior mridu snehana was done. Shatavari tail is indicated in disorders of vata

Janu Basti is most often recommended in condition like osteo-arthritis, stiffness of knee joints and pain (11)

Janu Basti may help to increase blood circulation to the affected area, gets rid of Dosha imbalances

### **Discussion on Leech application**

The leech salivary enzyme contains active substances such as bdellins which are proven anti-inflammatory, histamine, superoxide production and poorly characterized anesthetics and analgesic compounds. These substances might reach the deeper tissue levels and possibly joint spaces. Various bioactive substances in leech saliva may also be as pharmacologically potent as hirudin and thus exert substantial effects in periarticular tissue and adjacent structures. It has been proven that through Laser Doppler Flowmetry that there is a significant increase in superficial skin perfusion following leech therapy especially 16mm around the biting zone(12).

Therefore, a regional analgesic anti-phlogistic effect by these substances enforced by hyaluronidase, as well as counter irritation might be the possible reason for improvement following application of leech.

During inflammation, chemicals such as adenosine, prostaglandin (PG) E1 and PGF2 $\alpha$ , leukotriene B4 and (8R-15S)-dihydroxyeicosa-(5E-9,11,13,15)-tetraenoic acid (8R-15S-diHETE) are released within the joint, where they sensitize nerves, resulting in increased firing to a given stimulus (13). At the same time, inflammatory mediators such as bradykinin, histamine, 5-HT, PGE2, prostacyclin and acidosis stimulate nerves even in the absence of mechanical stimulation (14). Leech therapy could induce pain relief through antinociceptive effects and counter irritation.

Over a period of hours or days, recruitment of inflammatory cells and up-regulation of genes within the synovium generates cytokines such as IL-1, IL-6, IL-8 and TNF- $\alpha$ , in addition to nerve growth factor (15). These factors further enhance peripheral sensitization, whilst neuronal plasticity contributes to central sensitization. By the practice of blood-letting by application of leech in these inflammatory conditions of the joints the pathway of inflammation and thereby pain stimuli found to be receded.

### Physiotherapy

Daily physiotherapy for 15 days was advised.

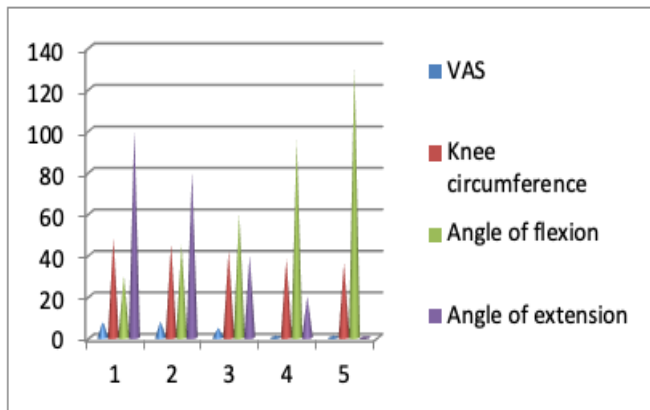
It included Quadriceps exercise started with short arch quad hold for 30 seconds 20-30 repetitions. Gradually long arch quad hold for 30 seconds 20-30 repetitions then squats 3 sets with 15 repetitions per day.

Patella moves, heel slides, quad stretching, Calf stretching exercises for improving flexion of knee.

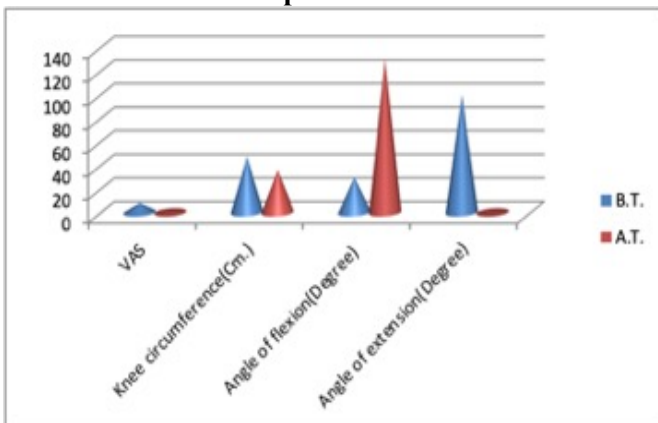
Mckenzie Extension exercises like floor based extension, Active and passive extension 5 sets with 15 repetitions per day.

This improved thigh circumference and strength of thigh muscles also range of motion improved.

**Graph No. 1 - Graphical representation of improvement**



**Graph No.2 - Before and after treatment improvement**



### Left Knee joint circumference before and after treatment



### Conclusion

Post traumatic chronic inflammatory synovitis responded well and significant improvement was also seen in both subjective and objective parameters with Leech therapy, herbo-mineral preparations and *Basti upakrama* especially *Panchtikta Ksheera basti*. Further well designed study should be done to assess the efficacy of this treatment in this condition.

### Statement of Ethics

An informed consent was obtained for minimally invasive treatment modality. Patient gave her informed consent for the publication of the study.

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### Conflict of Interest Statement

The authors declare that they have no competing interests.

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