



## Case Study

### A CLINICAL STUDY OF KNEE JOINT LIGAMENT INJURY WITH *KARKADA TAILA*

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#### ABSTRACT

Knee the prominent hinge joint which provides a variety of movements, makes a flexible life, is termed as *Janu sandhi* in Ayurveda. Ligament injuries of Knee has become an upsetting quandary in medical fraternity, moderate to severe, often poses variation of management from simple rest to reconstructive surgeries. These injuries related specially to sports personalities often impede their sustaining options in their field, ultimately hampers their hope of success, by all means. Even though reconstructive surgeries are celebrated a lot for this, their non judicial use even for a grade I injury paves many difficulties for patients of poor economic status. Ayurveda generally not going behind surgical methods, should find an aspirating solution in this regard. So an alternative cost effective modality is the need of time. With many discussions and trials here is a special preparation made in CARIN & MSD, Cheruthuruthy, which involved its internal intake as well as external use with which the major problems associated with Ligament injury are managed efficiently. Special *Taila* was used for 21 days and obtained enthusiastic result in this regard. Being a young age patient the result obtained was very sudden and complete. Here it was done for cruciate ligament injury. Other injuries like meniscal tears, collateral ligament should also be tried with the same *Taila*. The medicines organoleptic and biochemical evaluation can also be conducted further. Its use in other joint injuries may also be a considered as a matter for further studies.

**KEYWORDS:** Knee joint, Ligament injury, *Karkada taila*, Sports injuries, Special *taila*.

#### INTRODUCTION

Injuries to the Musculo skeletal system can result in damage to bones, joints, muscles and tendons. In addition, the neuro vascular bundle of limb may be damaged. With the increasing sporting activities injuries to knee especially on ligaments are on the increase. Irregular exercises i.e., person indulges in exercise discontinues it for a short period then restarts, are more prone to have knee joint ligament injury. With the tremendous advancement of Ayurveda in this field of Sports injury improved result yielding modalities are to be evolved for the better acceptance.

#### Some Structural considerations

The bones are connected together by the following ligaments<sup>1</sup>:

- The Articular Capsule
- The Anterior Cruciate
- The Ligamentum Patellae
- The Posterior Cruciate
- The Oblique Popliteal
- The Medial and Lateral Menisci
- The Tibial Collateral
- The Transverse
- The Fibular Collateral
- The Coronary

The knee-joint was formerly described as a Ginglymus or Hinge-joint (*Kora sandhi*), but is really of a much more complicated character. It must be regarded as

consisting of three articulations in one: two condyloid joints, one between each condyle of the femur and the corresponding meniscus and condyle of the tibia; and a third between the patella and the femur, partly arthrodial, but not completely so, since the articular surfaces are not mutually adapted to each other, so that the movement is not a simple gliding one. Acharya Gananathasen opines that *Kora sandhi* is of four varieties- *Ghalla kora*, *Paraspara kora*, *Chakra kora*, *Samdamsa kora*. Ayurveda mainly considers *Asthi sandhi* or Joint articulation primarily, it becomes innumerable when comes to *Sira sandhi* or *Pesi sandhi*, as *Sandhi* is nothing but a union of two or more similar or dissimilar things.

Related words like *Sandhi*, *Asthi*, *Snayu*, *Rajju*, *Kandara*, *Sira*, *Dhamani*, *Sleshmadhara kala*, are well known terminologies has to be read together with this context. The word *Sira* included as per the opinion cited by Acharya Sarngadhara as *Sira – Sandhi bandhana karaka*. In contexts like *Apabahuka* in Susrutha nidana *Siraasthu akunchya tatrastho janayathyapabahukam* and in the context of *Apabahuka*, vagbhata says *Sira saanyur vishoshya cha...*the word *Sira* may be taken for *Rajju* or *Kandara*. In embryological origin also the difference in *paaka ie Mrudu paaka* for *Sira* and *Ghara paaka* for *snaayu* are closely related. *Dhamani* has to be included as the nutrient arteries which nourishes joints. Another opinion Sarngadhara specifies *Snaayu* as *Maamsa asthi medo bandhana karaka*- the compactness of any joint.

Tendons nevertheless *Snaayu* or *Kandara* performs very crucial function regarding stability and to a certain extent mobility to each joint- *Chala* (mobile) or *Achala* (immobile). Even though 900 *Snayus* are mentioned, only 10 is attributed to each knee joint by Susrutha among which *Prathanavathi* type comes in joints which may be taken as Ligaments. *Vrutha snayu* may be taken as *Kandara*, *Pruthula snayu* may be for Aponeuroses. Only with these *Snayu* and *Sandhi* the person becomes *Bhaarakshama* or *Bhara saha* by Susrutha. Injuries to *Snayu* (hurt or sprain), ligaments imposes most problem for human beings than other injuries like bones, muscles or veins in view of Susrutha.

Injuries to *Snaayu* with foreign body as Susrutha<sup>2</sup> identifies this by elevated tendons, severe pain and stiffness. Rupture of *Snaayu* may be the underlying pathology in *Koubjya* (Hunchback)(Stiffness), difficulty in elevating body (Flexor / extensor weakness), inability in all movements of involved part with very severe pain like Osteo arthritis. Other diseases like *Baahya ayama*, *Pakshavadha*, *Apabahuka*<sup>3</sup> all involves the involvement of *snaayu*.

**Mechanism:** Knee ligaments are injured most often from indirect, twisting or bending forces in knee- in sports like Football, Kabbady etc.

Ligament	Mechanism	Pain	Swelling	Tenderness	Tests
Medial collateral	Valgus force	Medial side	Medial side	Medially on Femoral condyle	Valgus stress + at 30* knee flexion
Lateral collateral	Varus force	Lateral side	Lateral side	Laterally on Fibular head	Varus stress + At 30*knee flexion
Ant Cruciate	Hyper Extension	Diffuse	Haemarthrosis	Vague	Anterior drawer test+ Lachmann test +
Post Cruciate	Backward force on tibia	Diffuse	Haemarthrosis	Vague	Posterior drawer test +

On Radiological examination a plain X ray may be normal, or a chip of bone avulsed from the ligament attachment may be visible. MRI is a non invasive method of diagnosing ligament injuries, but is rarely needed.

#### Management

Being a controversial subject, conventionally treated by non operative methods, especially due to increasing demands in young athletic individuals, football players etc it necessitates the invention of newer techniques, even though better results are claimed by operative procedures like reconstruction especially of ACL (Anterior Cruciate Ligament). Ligament repair is done mainly for Grade III injuries.

**Conservative managements** like knee immobilization in Cylinder cast or Robert Jones bandage for a period of 3- 6 weeks, and is specially found to be good for Grade I and Grade II.

#### Case report

##### Age-40 years

With complaints of Pain, Restriction of Movements of right Knee joint, Oedema, Crepitus, associated with loss of stability of Knee joint -3years

A history of present illness revealed that 3years before one day he slipped while riding bike and fell down. He felt pain over right knee joint and was unable to do his day to day activities by pain. Pain aggravates on strain & alleviates on rest. Then consulted allopathic physician & advised surgery. To avoid surgical management he got admitted at CARIN&MSD Cheruthuruthy.

#### General examination

Built- Medium

Pallor/jaundice/cyanosis-NAD

Vitals-Temp-98.8F Pulse-74/mt Ht-5feet 4inches weight-69kg BP-120/80mmHg Respiratory rate-15/mt

Examinations of knee joint

Restriction of movement of right knee

Anterior drawer test- +

Lachmanns test- +

Pain-Diffuse

Tenderness-Vague

Crepitus-slightly

Investigations done-MRI

Complete tear of anterior cruciate ligament

Contusion edema on tibial condyle

#### Differential diagnosis

**Sandhigata vata**<sup>4</sup>- Disease manifested in *Janusandhi* but from history *Sandhigata vata* excluded

**Janusandhi marma kshata**-history suggested an acute onset and from examinations & MRI *Marma kshata* was confirmed.

#### Internal medications:

1. *Musthadi marma Kashaya* - 60 ml BD- Before food

2. *Lakshadi Guggulu*- 2-0-2 with *Kashaya*

3. *Karkada Taila* - 10 drops with Milk BD at 6 AM & 6 PM.

4. *Abyanga* with *Murivenna* and bandage with *Karkada taila*.

#### External treatments

1. *Abhyanga* with *Murivenna* for 7 days along with Bandage with *Karkada taila*

2. *Patra podala sweda* for 7 days with Bandage with *Karkada taila*

3. *Shasthika pinda sweda* for 7 days with Bandage with *Karkada taila* - Locally

#### Assessment Chart

##### 1.Gradientation of Pain

No pain

Grade 0

Mild pain

Grade I

Moderate pain	Grade II
Severe pain	Grade III

**2. Gradation of Tenderness**

No tenderness	Grade 0
Mild-patient complains pain	Grade I
Moderate-patient winces with pain	Grade II

**3. Gradation of Swelling**

No swelling	Grade 0
Mild swelling	Grade I
Moderate swelling	Grade II
Severe swelling	Grade III

**4. Gradation of Limitation of Flexion**

No limitation of flexion (flexion $\geq$ 135°)	Grade 0
Mild limitation flexion (flexion $<$ 135° but $\geq$ 90°)	Grade I
Moderate limitation of flexion (flexion $<$ 90° but $\geq$ 45°)	Grade II
Severe limitation of flexion (flexion $<$ 45°)	Grade III

**5. Assessment of Limitation of Extension**

Full extension to 0° possible	Normal
Full extension to 0° not possible	Restricted

**6. Gradation of Joint instability**

No instability	Grade 0
Mild instability (Instability appreciable by the patient but cannot be elicited on clinical examination)	Grade I
Moderate instability (Instability can be elicited on clinical examination)	Grade II

**7. Gradation for Crepitus**

Severe – even with slight joint movement	Grade III
Moderate crepitus	Grade II
Mild Crepitus	Grade I
No Crepitus	Grade 0

Complaints	Day 1	Day 8	Day 15	Day 22
Pain	III	II	I	0
Restriction of Movements	III	II	I	0
Oedema	III	II	I	0
Crepitus	II	II	I	I
Instability of Joint	II	II	I	0

**Follow up for 6 months****Preparation of Karkada Taila****Ingredients**

- Tila taila* – oil of *Sesamum indicum* Linn.
- Nilanaraka* – *Naregamia alata* Wight and Arn
- Terrestrial crab – *Sesarma (Sesarma) quadrata* (Fabricius)

**Collection of drugs:** Terrestrial crab known as *Karikkachi njandu* in Malayalam is very common in the estuarine

areas of Kerala. It was collected from North Paravoor, Kerala, with the help of fishermen. The specimen was identified as *Sesarma (Sesarma) Quadrata* (Fabricius) in the Department of Fisheries Biology, College of Fisheries, Kerala Agricultural University, Ernakulam. The whole crab including its shell was used to prepare Mamsarasa. The shrub locally known as “*Nilanaraka*” was collected fresh and identified as *Naregamia alata* Wight and Arn. The whole plant was used for making *Swarasa* and *Kalka* in the preparation of processed *Taila*. *Tila taila*<sup>5</sup> (sesamum oil) was purchased from the market.

**Preparation of mamsarasa**

500gm of terrestrial crab was crushed, cooked in 8 litres of water, reduced to 2 litres and sieved.

Ratio of ingredients of *taila*

*Nilanaraka kalka* -250 gm

*Nilanaraka swarasa*- 6 litres

*Mamsarasa* -2 litres

*Tila taila* - 2 litres

*Mamsarasa* being a content, the preparation of the *Taila* was done in one day

**Discussion**

The ligaments in the knee which are commonly injured are the anterior cruciate and the medial collateral. Lateral collateral ligament of knee is rarely injured. Grade I and Grade II tears of these ligaments are usually managed conservatively, whereas in case of Grade III tear surgical repair and reconstruction are usually done. In Ayurveda the term *Janu sandhi*<sup>6</sup> denotes the knee joint. *Janu* is a *Sandhi marma* which is *Vaikalyakara* according to prognosis. *Janu sandhi* is held by *Pratanavati snayu* or ligaments and *Vritta snayu* or tendons. Injuries to ligaments and tendons take more time to heal. The clinical features of ligamentous injuries of knee joint can be compared to *Janu marmabhighata lakshanam*, *Snayu vidha lakshanam*, *Sandhi vidha lakshanam*<sup>7</sup> and *Janu sandhimukta lakshanam*. *Marmabhighatha cikitsa* and *Sandhimukta cikitsa*<sup>8</sup> are applicable in ligamentous injuries of knee joint.

*Taila* is the best among the drugs in the treatment of *Vata*. *Nilanaraka* is a very good anti-inflammatory drug. The whole of crab including its shell was used in the preparation of the *Taila*. *Karkataka* or crab symbolizes joint strength and is described as *Brumhana* and *Bhagnasandhana*. Healing of ligaments takes much time and immobilization during this period is essential for the end-to-end apposition of the torn fibres and proper healing. Bandage for 21 days may help the same. The *Taila* used for bandaging may have been helpful in reducing inflammation and assisting proper healing. Systemic absorption of drugs after topical application depends primarily on the lipid solubility of drugs. Absorption can be promoted by rubbing the drug incorporated in an oleaginous base or by use of occlusive dressing which increases hydration of the skin. Local application of a drug at the desired site increases the concentration of the drug reaching the particular site. In the present study the use of *Taila* as the base, gentle massage after application of the *Taila* and bandaging the area helps to increase absorption of the drug. Ligaments are structures with very little

vascularity and hence increasing the vascularity to the area is very important in promoting the healing of ligaments. *Ekangaseka* is a method of *Snigdha sweda* or *oily fomentation* and produce vasodilatation giving increased vascularity to the area assisting repair. *Ekangaseka* done with the prepared *Taila* after 21 days of bandage, for seven days, may give relaxation to the muscles of the affected limb, reduce the stiffness produced by prolonged immobilization and prevent complications such as muscle wasting. Due to these, the range of movement improves considerably after *Ekangaseka*. The shell of crab and other crustaceans is rich in glucosamines. Glucosamine is a precursor of a variety of chemicals which are involved in the building up of ligaments, tendons, cartilage and synovial fluid. Supplemental glucosamine is widely given orally in the management of osteoarthritis. Contemporary research works show that the effectiveness of glucosamine in patients with osteoarthritis may result from anti-inflammatory activity, stimulation of proteoglycan synthesis and decrease in the catabolic activity of chondrocytes inhibiting the synthesis of proteolytic enzymes. The Central Marine Fisheries Research Institute is recently marketing green mussel extract under the trademark 'cadalmin' for internal administration in chronic joint pain, arthritis and inflammatory disorders. '*Nonganadi tailam*' is a classical Ayurvedic preparation containing crab used for internal administration in elephantiasis. The drug used in the present study may give added effect, if internally administered along with external application

#### Properties of Karkadaka

Among the *Koshatha* and *Padina* varga mentioned in *Susrutha samhitha sootrasthana* chapter 46, 111 *Sloga* it is mentioned as *Balya*- providing energy, *Koshna*- not too *Ushna*, *Vathahara* and got the capacity increasing joint stability.

#### Nonsurgical Treatment Benefits and Limits

Surgical treatment is usually advised in dealing with combined injuries (ACL tears in combination with other injuries in the knee). However, deciding against surgery is reasonable for selected patients. Non surgical management of isolated ACL tears is likely to be successful or may be indicated in patients:

- With partial tears and NO instability symptoms.
- With complete tears and no symptoms of knee instability during low-demand sports who are willing to give up high-demand sports
- Who do light manual work or live sedentary lifestyles

- Whose growth plates are still open (children)

#### What if not managed?

Mainly instability, in long term leading to Osteoarthritis.

#### What to be taken care of further?

- Modification of active lifestyle to avoid high demand activities
- Muscle strengthening exercises for life
- May require knee brace

Despite above precautions, secondary damage to knee cartilage & meniscus will lead to premature arthritis.

#### CONCLUSION

Management of Knee joint ligament injury with *Karkadaka taila* is found to be effective.

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