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To evaluate the efficacy of *Dashangsunthi Lepa* in management of *Shotha* and *Shula* in case of *Asthibhagna*

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Abstract

Sandhi Shotha and *Shula* are widely observed symptoms in many diseases like *Aamvata*, *Vatarakta*, *Avabhahuka*, *Vatakantaka*, *Sandhigatavata*, *Aghatajanya Shotha* etc. *Sushruta Samhita Sutrasthan* in *Vranalepab* and *avidhiadhyaya* before *bandha* it is given prime importance in *Vranachikitsa* [1]. *Lepa* is one of the treatment modalities available for the treatment of *Sandhi Shotha* and *Shula* among many others. As *Lepa* is inexpensive, easy to apply and does not need to be consumed and rapid in action it was taken up for the present study. Present study is aimed at proving that *Sandhi Shotha* and *Shula* arising in *Asthibhagna* can be effectively treated with *Bhirparimarja chikitsa* i.e. *Lepa Kalpana*. In the specific treatment of *bhagna*, *lepa* is explained as the treatment purpose. The *lepa* used is *Dashang Sunthi lepa* which is *Shothagana* and *Shulagna* in action and therefore helpful in reducing *Shotha* and *Shula* caused by *Aghata* in *Asthibhagna*. The *Vata dosha* which has been vitiated on account of injury causes *Rakta*, *Pitta*, *Kapha* to proceed towards *bahisiraas* there is rupture of this *Sira* which rupture and causes this *Rakta*, *Pitta*, *Kapha* to accumulate within the muscles and among the layer of the skin leading to swelling around the fracture tissue. This elevation is referred as *Aghatjanya Shotha*. The constituents of *Dashang Sunthi* viz. *Daruharidra*, *Haridra*, *Raktachandhan* have anti-inflammatory which helps in reducing *Shotha* and *Shula*. *Sunthi* is *Vatakaphagna* properties causes *Vedanashaman* and therefore *Dashang Sunthi* was selected for the treatment of *Asthibhagna*.

Keywords: *Lepa*, *Bhagna*, *Ropana*, *Shothagna*, *Sandhan*

Introduction

Lepa is *Aadhyaupakarama* discussed by *Acharya Sushruta* in *Sushruta Samhita Sutrasthan* in *Vranalepab* and *a vidhiadhyaya*. While describing *Vranachikitsa* [1] *lepa* is given prime importance. *Dashang Lepa* is first described in *Bhaishajya Ratnavali* and a detailed description is given in *Sharangdhara Samhita* [2]. Since it has *Shothgana* and *Shulagna* properties it was selected for treating this case. The constituents of *Dashang lepa* viz. *Haridra*, *Devdaru*, *Tagar*, have anti-inflammatory property which helps in reducing *Shotha* and *Shula* caused by vitiation of *Rakta*, *Pitta* and *Kapha* which causes inflammation at the fracture site. *Raktachandan* [4] and *Yashtimadhu* helps in healing the tissue and also reduces pain at that site of fracture. *Sunthi* due to its *Shulagna* (anti-inflammatory) property helps in reducing *Shotha* and *Shula* [3] and was therefore added to *Dashangalepa*.

The most common causes of fibular fracture are low energy injuries-simple ground level falls or sports injuries in athletes, sprains. High energy injuries- such as those caused by motor vehicle accidents, gunshots or wounds. In fibula fracture signs and symptoms include pain, swelling, tenderness, inability to bear weight on the injured part. First line of fracture treatment is immobilization of the part after x-ray confirms the diagnosis of fracture POP (plaster of Paris) is put to stabilize the movement till it heals. Most of the time people find difficulty in doing their routine duties like walking, driving etc. After putting POP plaster. Keeping this in mind a treatment procedure which is easy to apply, inexpensive, need not be consumed and fast in action *lepa* i.e. *Dashang Sunthi Lepa Kalpana* was selected in treating this case. The aim was to see the results treating a case of fracture of fibula post POP plaster which had *Sthoth* and *Shula* at ankle joint even after its removal after 1 month.

Case History

A 50 years old male, driver by occupation reported to KAD OPD with fracture of distal part of fibula Post POP plaster removal. The POP plaster was kept for a period of a month and then removed by his doctor. Since *Shotha* and *Shula* on dorsal aspect of ankle was still present the patient approached KAD. On examination it was understood that the patient had spiral, simple distal fracture of fibula due to the fall of branch of tree on his back due to the impact of which he was thrown with his face down onto the ground on 14th August 2021. He had bruises on his chest and superficial abrasions on shoulder and flanks. He was given analgesics at the PHC. The swelling and pain did not subside even after 9 days of the fall due to which he was taken back to PHC, x-ray was taken which revealed fracture of fibula on 26th August 2021. After performing reduction

pop was put on same day which was then removed after one month on 27/9/2021. Since *Shotha* and *Shula* on ankle persisted patient reported to KAD OPD no 3 for further treatment and management. No history of medical illness. Personal history revealed alcohol intake occasionally 1 peg/day thrice a week for the last 17yrs. clinically vitals were found to be normal. On investigation X-ray revealed fracture of distal part of fibula.

Therapeutic intervention

Oral medication

No internal medicine was given.

External application

Dashang Sunthi Lepa application for 7 days was given to the patient.

Table 1: Ingredients of *Dashang Sunthi Lepa*

Sr. No	Drug	Rasa (Taste)	Guna (Physical Property)	Virya (Potency)	Vipaka (out come after digestion)	Dosh Karma (effect on doshas)	Parts used
1.	<i>Shirish</i> (<i>Albizzia lebeck</i> Benth)	Kashaya	Laghu, Ruksha	Ishad-Ushna	Katu	Tridosahara	Bark
2	<i>Madhuyashti</i> (<i>Glycyrrhiza glabra</i> Linn)	Madhura	Guru, Snighda	Sheeta	Madhura	Vata-Pittashamak	Root
3	<i>Tagar</i> (<i>Veleriana wallichii</i> DC)	Tikta, Katu, Kashaya	Laghu, Snighda	Ushna	Katu	Kapha-Vatashamak	Root
4	<i>Raktachandan</i> (<i>Pterocarpus santalinus</i> Linn)	Tikta, Madhura	Guru, Ruksha	Sheeta	Katu	Kapha-Pitta Shamak	Heartwood
5	<i>Ela</i> (<i>Elettaria cardomomum</i> Linn. Maton)	Katu, Madhura	Laghu, Ruksha	Sheeta	Madhura	Tridosahara	Fruit-seed
6	<i>Jatamansi</i> (<i>Nordostachys jatamansi</i> DC)	Tikta, Kashaya, Madhura	Laghu, Snighda, Tikshana	Sheeta	Katu	Kapha- Pittashamak	Rhizome
7	<i>Haridra</i> (<i>Cucurmalongalinn.</i>)	Tikta, Katu	Laghu, Ruksha	Ushna	Katu	Kapha-Vatashamak Pittarechak	Rhizome
8	<i>Daruharidra</i> (<i>Berberis, aristata</i> DC)	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu	Kapha-Vatashamak	Root
9	<i>Kushta</i> (<i>Saussurealeppa</i> C.B. Clarke)	Tikta, Katu	Laghu, Ruksha	Ushna	Katu	Kapha-Vatashamak	Root
10	<i>Usheer</i> (<i>Vetiveria zizanicidisi</i>)	Tikta, Madhura	Laghu Ruksha	Sheeta	Katu	Pitta VattaShamak	Root
11	<i>Sunti</i> (<i>Gingiber officinale</i>)	Katu	Laghu, Snighda	Ushna	Madhura	VataKaphahara	Rhizome

Hrivera (*Pavonia odorata*) is controversial drug and is not available. Hence *Usheera* (*Vetiveria gramineae*) which is mentioned as *Aabhavadravya* for *Hrivera* was used in equal quantity in place of *Hrivera*.

The procedure of application of *Dashanga Sunthi Lepa* includes

- Poorva Karma*
- Pradhana Karma*
- Pashchat Karma*

Poorva Karma

Local examination of the patient was done to find out if there are any cuts or injuries on the area where *Lepa* was to be applied. Then the part was cleaned with luke warm water after which *Dashang sunthilepa* was applied along with a demonstrating of preparation and application of *lepa* was given to the patient on the 1st day. According to the joint involved suitable position was given to the patient. The

affected joint was cleaned with cotton soaked in warm water and then dried. Water was taken in vessel and heated on gas stove and when water started boiling q.s of *Dashang choorna* and q.s of *Sunthi Choorna* in equal parts was put in a vessel and stirred continuously till the consistency of *Lepa* was achieved.

Pradhan karma

Lepa of thickness of *Aardra mahishacharma* ^[5] (0.5cm) was applied in direction opposite to hair follicles (from below upwards) ^[6]. *Lepa* was kept for 2 hours and then removed. *Lepa* was applied once daily for a period of 7 days.

Pashchat Karma

After 2 hours of stipulated time, the *Lepa* was washed with luke warm water & patient was requested to rest for ½ an hour.

From day 1 to day 7 *Lepa* application was done and from day 8 to day 14 no medication was given to the patient on day 14 follow-up was taken to assess the condition of patient.

Observations and Results

Assessment Criteria

1. Shotha

Acc to Ayurveda

One of the main symptoms of *Bhagna* is swelling due to accumulation of fluid in extracellular area around the fracture. *Vata Dosha* gets *Prakupit* on account of injury and takes *Rakta, Pitta, Kapha* towards *Bahisira*. As these *Sira* rupture *Rakta, Pitta, Kapha* flows out and accumulates within the muscles and among the layers of the skin leading to swelling around the fracture tissue. This elevation is referred to as *Aghatjanya Shotha*. The assessment of this swelling was done using VAS for Swelling.

ACC to Modern

When fracture of bone takes place. Body identifies a harmful invader, such as a bacteria or virus, it initiates a whole-body immune response to fight it off White blood cells trigger the release of several inflammatory chemicals. Inflammation causes to feel sick and exhausted, as body puts all of its energy toward fighting off infection. Inflammation itself is stimulated by the increased movement of inflammatory/immune chemicals (leukocytes, neutrophils, macrophages, phagocytes, etc.) into the injured areas. These chemicals take care of the cellular debris and attract plasma (fluid from the blood) and blood proteins to the site of injury.

2. Shula

Acc to Ayurveda

Vata which is provoked due to *chala guna* is responsible for producing *Vedana*, Pain at fracture site.

ACC to Modern

Immediately following fracture, mechano-sensitive nerve fibers that innervate bone are mechanically distorted. This results in these nerve fibers rapidly discharging and signaling the initial sharp fracture pain to the brain. Within minutes to hours, a host of neurotransmitters, cytokines, and nerve growth factors are released by cells at the fracture site. These factors stimulate, sensitize and induce ectopic nerve sprouting of the sensory and sympathetic nerve fibers which drive the sharp pain upon movement and the dull aching pain at rest.

3. Investigations

1. ESR on 1st, 7th, 14th day.
2. CRP Quantitative on 1st, 7th, 14th day.
3. Xray Taken BT and AT

Observations and Results

Table 2: General Examination of joint involved

Joint involved	Darshana	Sparshana	Prashna
Ankle joint	<i>Shotha</i>	<i>Ushna</i> [+ +]	<i>Aakunchanprasaransama yevedana</i> [++]
	<i>Varna Shyaav - Raktavarniya</i>	<i>Jalapurna</i> [++]	

Table 3: VAS (visual analoguescale) for swelling

Joint involved	DAY 1	DAY7	DAY 14
Ankle joint	3	1	0

Table 4: VAS (Visual analogue scale) for pain

Joint involved	DAY 1	DAY7	DAY 14
Ankle joint	3	2	1

Table 5: Measurement of degree of mobility by goniometer

Degree of Flexion/extension	Day 1	Day7	Day 14
Plantarflexion	140 ^o with severe pain	150 ^o with bearable pain	160 ^o with mild pain

Table 6: Objective parameters

Investigations	DAY 1	DAY7	DAY 14
ESR	15 mm/hr	20 mm/hr	15 mm/hr
CRP	0.5 mg/dl	0.5 mg/dl	0.5 mg/dl

When investigation done on 7th day i.e post application of *lepa* it was found there was increase in value of ESR which shows there was stage of *Brajhan* taking place as due to application of *lepa* it irritates the swollen tissue due to accumulation of *Rakta, Pitta, And Kapha* which is present in *Bahisira*, layers of skin and muscle tissue causing inflammation. Which gets settle with phagocytosis and decreases in symptoms of *Shotha* and *Shula* are found in values of ESR level decreased is noted in investigation done on 14th day.

X-Ray Findings BTAT



Fig 7: Showing Before treatment



Fig 8: Showing during *Lepa* Application



Fig 9: Showing After treatment

Discussion

In case of fracture The *Vata Dosh* which has been vitiated on account of injury causes *Rakta, Pitta, Kapha* to proceed towards *Bahisiraas* there is rupture of this *Sira* which ruptures and causes this *Rakta, Pitta, Kapha* to accumulate within the muscles and among the layer of the skin leading to swelling around the fracture tissue. This elevation is referred as *Aghatjanya Shotha*. (Fig. no 7) Within minutes of bone fracture, a wide variety of stromal and inflammatory cells release mediators that can directly activate or sensitize nociceptors that normally innervate the bone. These mediators include prostaglandins, bradykinin, endothelins, and nerve growth factor which have all been shown to excite and/or sensitize nociceptors that innervate the bone causing pain.

Lepachikitsa is given importance in *Sushruta* [7] it is said as pouring the water on burning fire it extinguishes the fire immediately in the same way by applying *lepa* provoked *doshas* gets subsided very easily. The constituents of *Dashang Sunthi* viz. *Daruharidra, Haridra, Raktachandhan, Tagar* have anti-inflammatory which helps in reducing *Shotha* and *Shula*.

Sunthi due to *Vatakaphagna* properties acts on *Vata* and *Kapha*. *Sunthi* is described as *Vedanashara* due to its *Theekshna veerya* [8] it reaches *Sukshmasrotas* at nerve by desensitizing nerve therefore helps in reducing pain.

Yasthimadhu has anti-inflammatory [9], antimicrobial activity, wound and ulcer healing properties. *Yasthimadhu* was *Pithagahna* helps in reducing *Pitta* and *Rakta* by reducing *Shoth* due to *phagocytosis*. Further *Lepa* works on *Prasadan* [10] of *Raktadhathwagni* and helps in proper circulation on affected parts thus helps in *Ropana* of fracture.

Raktachandhan, Daruharidra, have anti-inflammatory property which help in reducing *Shoth, Shulas* and wound healing property [12].

Shirisha (Albizzialebeck) It has described *Vishaghna* (destroys poison), antihistaminic, anti-inflammatory [13], antioxidant [14], antiallergic [15], analgesic and mast cell stabilizing properties.

It was observed there was elevated level in ESR value during the *lepa* application which suggest there is irritation of tissue level which comes to normal levels of ESR value after completion of *lepakalpana* with regression of symptoms of *Shoth* and *Shula* (fig.no 9).

Reduction and Immobilization of the fibula helps in restriction of its activities which helps in its faster recovery. Thick *lepa* (0.5cm) of *Dashang Sunthi* applied on affected part and kept for 2 hours found to effective in reducing *Shotha* and *Shula* caused due to *Asthibhagna*.

Conclusion

It was concluded that *lepa Dashang Sunthi* has ingredient which are *Shothagna* and *Shulagna* helps in reducing *Shoth* and *Shula*. Immobilization is one main factor in ankle injury [16] after reduction till wound gets properly healed. *lepa* application which kept for 2 hour restricted the part to move which helped for fracture come to heal faster. Most of the ingredient of *Lepa* like *Shirish (Albizzialebeck)* [17], *Tagar (Velerianawallich)* [18], *Daruharidra (Berberis, aristata)* [19] poses *Kashay rasa* which help for *Shodan* of *vrana*. *Sunthi (Zingiberofficinalis)* acts on *Vata* and *Kaphashaman* [20]. Due to its *Teekshnaveerya* it reaches *Shukmasrotas* thus nullifies the pain causing nerves. *Madhuyashti (Glycyrrhizaglabra)* has anti inflammatory, antimicrobial activity, wound and ulcer healing properties it helps *ropan* of wound [21]. Overall *lepa Dashang Shunti* was found in subsiding *Shothgna* [22] and *Shulagna* helps in allivating *Shothand Shula* caused due to *Asthibhagna*.

Abbreviations

OPD, Out Patient Department; KAD, Kamakshi Arogya Dhama; VAS, Visual Analogous Scale; BT, Before treatment, AT, After treatment; ESR, Erythrocyte Sedimentation Rate; CRP, C-Reactive Protein; POP, Plaster of Paris.

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