

CASE STUDY

Effectiveness of Nagaradi lepa bandage in the Management of Ankle Sprain: A Single Case Study

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ABSTRACT

Ankle sprains, often causing pain, swelling, and restricted movement, are commonly managed with the RICE method (rest, ice, compression, and elevation) and supportive bandaging. This case study presents an alternative approach using Nagaradi lepa, an Ayurvedic herbal paste, combined with a crepe bandage. An 18-year-old patient with acute ankle sprain symptoms, including pain and difficulty in walking, running, and stair climbing, was treated with this method. On the first day, his Karlsson score, which reflects ankle function (lower values indicate worse function and higher scores show better recovery), was 50. After applying Nagaradi lepa, known for its anti-inflammatory and analgesic effects, the patient saw a marked reduction in pain and swelling, with his score rising to 75 by the end of the treatment. After 21 days, he regained full mobility, including the ability to run. This case suggests that Nagaradi lepa offers an effective, holistic treatment for ankle sprains, aligning with Ayurvedic principles, and merits further research for broader musculoskeletal applications.

Keywords: Nagaradi lepa, Ankle Sprain, Crepe Bandage, Karlsson grading, RICE.

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INTRODUCTION

The ankle is one of the most common sites for acute musculoskeletal injuries, and sprains account for 75 percent of ankle injury [1]. Acute ankle trauma is responsible for 10 to 30 percent of sports-related injuries in young athletes. Each year, an estimated 1 million persons present to physicians with acute ankle injuries [2]. Over the years, various preventive strategies have been implemented; however, a recent epidemiology revealed that ankle sprain injury still dominated in sport injury, as it accounted for 14% of all attendance in an accident and emergency department [3]. The most common mechanism of injury in ankle sprain is the combination of inversion and adduction of the foot in conjunction with plantar flexion (supination), which most usually provokes a deterioration of the external lateral ligament and also often impacts on the anterior peroneal tendons [4]. According to Sushruta, Marma point is an anatomical site where Mansa (muscles), Sira (blood vessels), Snayu (tendon), Asthi (bones), Sandhi (joint) confluence. According to traumatic effect, Marma is classified as Sadhyapranahara (causing death immediately), Kalantarapranahara (causing death on time), Rujakara (causing pain), Vaikalyakara (causing deformity) and Vishlyaghna (one with foreign body) [5]. Conventional method of treating an ankle sprain includes various immobilization methods like ankle brace, ankle support etc. Along with regular intake of NSAIDS for symptomatic relief [6].

CASE REPORT

Personal History:

A 18-year-old male football player presented to the Shalyatantra Department OPD with complaints of pain in the Right Ankle Joint, mild swelling, and difficulty in Walking & Running for the past two days following a history of splaying of foot during a match. He was previously healthy until he experienced a sudden twist in the ankle while playing football, which caused the current symptoms.

Occupation: Student at Parul University

Table 1: General Physical Examination (Vital Parameters)

Sr no.	Vitals	
1	BP	120/70 mm Hg
2	Pulse	76/min
3	Temperature	A febrile
4	Respiration rate	16 min
5	Addiction	Not addicted to smoking and alcohol

Nadi	Vata Pitta
Mutra	5-6/day
Sparsh	Ushana
Mala	Badhha
Shabda	Normal
Gihva	Niram
Drika	Normal
Akriti	Madhyam

Table 2. Asthavidha Pariksha Findings

CLINICAL FINDINGS

On examination, the patient was conscious, well oriented, and cooperative. His vitals were stable. There was noticeable swelling around the Right Ankle Joint. Swelling is typically seen on the lateral side of the ankle. The patient's range of motion was restricted due to pain and the patient arrived in the OPD with the support of a friend. On palpation Tenderness present over Ankle Joint. Palpation during movement (dorsiflexion, plantar flexion, inversion, and eversion) revealed pain, possibly indicating ligament involvement. Patient was not able to do heel walking, toe walking and not able to bear a body weight on affected leg.

Management

Nagaradi lepa bandage is applied in affected ankle joint.

INGRIDENTS OF NAGARADI LEPA:

Table 3 : Composition of Nagaradi Lepa with Botanical Names

INGRIDENTS	BOTANICAL NAME
<i>Nagar</i>	<i>Zingiber officinale</i>
<i>Kumari</i>	<i>Alovera</i>
<i>Vacha</i>	<i>Acours calamus</i>
<i>Lakh</i>	<i>Laccifer lacca</i>
<i>Bola</i>	<i>Commiphera myrrha</i>
<i>Shal</i>	<i>Shorea robusta</i>
<i>Borex</i>	<i>Tankan</i>

Nagaradi lepa was bought from Vaidyaratnam pharmacy for the treatment.

Timeline of Treatment and Functional Assessment:

On **Day 1**, the patient presented to the OPD with swelling in the right foot. An X-ray was performed, revealing no bony abnormalities. The **Karlsson criteria** were used to assess the ankle, and the Karlsson Score on Day 1 was recorded as 50.

By **Day 8**, a treatment of Nagaradi lepa was applied with a crepe bandage for 7 days. The patient returned for a follow-up check-up in the OPD, where active ankle movement was assessed. The Karlsson criteria were again evaluated, with the patient's score improving to 75.

On **Day 21**, 14 days after the completion of treatment, the patient followed up. The Karlsson criteria were reassessed, and the score further improved to 90. By this time, the patient was able to resume normal activities, including running and stair climbing, without any problems.

THERAPEUTIC INTERVENTION:

Nagaradi lepa was applied to the affected area in a pratiloma direction, followed by crepe bandaging. This procedure was repeated for seven days. The lepa was applied as per the Alepa guidelines mentioned in Sushruta Samhita. Acharya Sushruta instructed that the Thickness of Lepa should be equivalent to Ardra Mahisha Charma (moist buffalo's skin.) It is 4-5 mm approximately¹¹.



Fig 1 and 2. Image of day 1 showing swelling



Fig 3 Image Day 3 applying of lepa and showing reduce swelling



Fig 4: Image Day 7 applying of lepa and showing reduce swelling



Fig 5: Image Day 21 showing reduce swelling

ASSESSMENT CRITERIA:

- The Karlsson and Peterson scoring system for ankle function.
- The Karlsson scoring scale consists of eight categories with a total of 90 points.
- The level of pain was evaluated using a 5 point pain scale: no pain (1) mild pain (2) moderate pain (3) severe pain (4) overwhelming pain/ worst ever (5).

Table 4: Interpretation of Karlsson and Peterson Ankle Scoring System

Category	Degree	Score
Pain	None	20
	During exercise	15
	Walking on uneven surface	10
	Walking on even surface	5
	Constant (severe)	0
Swelling	None	10
	After exercise	5
	Constant	0
Subjective Instability	None	15
	Walking on uneven surface	10
	Walking on even surface	5
	Constant (severe, ankle support required)	0
Stiffness	None	5
	Moderate (In the morning or after exercise)	2
	Marked (Constant)	0
Stair climbing	No problem	10
	Impaired (instability)	5
	Impossible	0
Running	No problem	10
	Impaired	5
	Impossible	0
Work activities	Same as before injury	15
	Same work, less sport, normal daily activities	10
	Light work, no sports, normal daily activities	5
	Severely impaired work, decreased daily activities	0
Ankle support	None	5
	Support during exercise	2
	Ankle support during daily activities	0

Karlsson Peterson score⁹

- 85-90: excellent
- 70-84: good
- 50-69: fair
- <50 : poor

FOLLOW-UP AND OUTCOME:

The follow-up and outcome of the treatment revealed remarkable progress in a young football player suffering from an ankle sprain. Initially, he struggled with pain, swelling, and difficulty moving. After just a week of applying *Nagaradi lepa* along with crepe bandaging, his condition improved noticeably, with reduced discomfort and swelling, allowing for better mobility. By the third week, he had regained full function, effortlessly resuming activities like running and climbing stairs. This holistic Ayurvedic approach not only sped up recovery but also proved highly effective in restoring joint strength and flexibility.

TABLE 5 : Karlsson Ankle Function Score Before Treatment, After Treatment, and Day 21 Follow-up

Category	Degree	B.T.	A.T.	Day21
Pain	None	20	20	20
	During exercise	15	15	15
	Walking on uneven surface	10	10	10
	Walking on even surface	5	5	5
	Constant (severe)	0	0	0
Swelling	None	10	10	10
	After exercise	5	5	5
	Constant	0	0	0
Subjective Instability	None	15	15	15
	Walking on uneven surface	10	10	10
	Walking on even surface	5	5	5

	Constant (severe, ankle support required)	0	0	0
Stiffness	None	5	5	5
	Moderate (In the morning or after exercise)	2	2	2
	Marked (Constant)	0	0	0
Stair climbing	No problem	10	10	10
	Impaired (instability)	5	5	5
	Impossible	0	0	0
Running	No problem	10	10	10
	Impossible	0	0	0
Work activities	Same as before injury	15	15	15
	Same work, less sport, normal daily activities	10	10	10
	Light work, no sports, normal daily activities	5	5	5
	Severely impaired work, decreased daily activities	0	0	0
Ankle support	None	5	5	5
	Support during exercise	2	2	2
	Ankle support during daily activities	0	0	0
	Total	50	75	90

*B.T. - Before Treatment

*A.T. - After Treatment

RESULT AND DISCUSSION

The application of Nagaradi lepa with crepe bandaging over 7 days resulted in significant improvements for patients with ankle sprains. Pain levels reduced from moderate to severe to mild or none, swelling visibly decreased, and ankle function improved from fair on Day 3 to good on Day 7 and excellent on Day 21 based on the Karlsson and Peterson scoring system. A patient regained mobility and experienced faster recovery and was able to perform heel and toe walking and was able to bear body weight on the affected leg. After 21 days, the patient was able to resume running, regaining full functionality as a football player.

The study evaluated the effectiveness of *Nagaradi Lepa*, a traditional Ayurvedic herbal paste, in treating ankle sprains. It was applied along with a crepe bandage for 7 days. The ingredients of the lepa, including *ginger*, *Aloe vera*, and *myrrh*, are known for their anti-inflammatory and analgesic properties. The treatment led to significant improvement in reducing pain, swelling, and enhancing ankle mobility, as assessed by the Karlsson and Peterson scoring system. On Day 1, the patient's Karlsson score was 50. After 7 days of treatment, the score improved to 75. Further improvement was observed during follow-ups on Day 21, with the score increasing to 90. This suggests that *Nagaradi Lepa* can be an effective alternative to conventional treatments for managing ankle sprains. Additionally, the lepa mixture solidified into a hard consistency upon application, possibly contributing to joint splinting, which is a mainstay of treatment. While water was used in the mixture for the lepa in this case, traditional practice often uses egg white. However, the mixture was made with water at the patient's request.

CONCLUSION

The study concludes that Nagaradi lepa, when used in combination with crepe bandaging, is an effective treatment for ankle sprain. The herbal paste helped in reducing pain and swelling, improving joint mobility, and accelerating recovery. The nagaradi lepa works both as a minimal splintage due to its consistency and also the medication helps in pain reduction during the lepa's contact with skin. This both effects may have helped in augmenting the recovery of the patient faster to normal life. The results suggest that this Ayurvedic approach provides a viable alternative to conventional treatments, especially for managing soft tissue injuries like ankle sprains. Further studies involving larger patient populations are recommended to substantiate these findings and explore broader applications of this treatment in musculoskeletal injuries.

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