



**BANDHANA KARMA: A STUDY ON SUSHRUTA'S ADVANCED TECHNIQUES IN ANCIENT BANDAGING PROTOCOLS**

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**ABSTRACT**

*Bandhana Karma*, a fundamental aspect of *Shalya Tantra* (Ayurvedic surgery), is a collection of bandaging methods intended to promote and encourage the recovery of a wound. This study explores the intricate practices outlined in the Ayurvedic text ~ *Sushruta Samhita* with an emphasis on the proficient bandaging techniques advised by *Acharya Sushruta*. Through an analysis of text, this paper aims to elucidate the understanding of Sushruta's bandaging techniques. By exploring the principles and methods of *Bandhana Karma*, this study sheds light on the enduring relevance and efficacy of these ancient healing practices in contemporary healthcare.

**KEYWORDS :** Wound management, Ayurveda, Shalya Tantra, Bandaging, Sushruta Samhita

**INTRODUCTION**

An intricate understanding of wound care and therapeutic intervention is embodied in *Bandhana Karma*, a cornerstone of the ancient Indian medical tradition explained in the *Sushruta Samhita*. Based on the principles of Ayurveda, the holistic medical system, *Bandhana Karma* describes complex bandage application techniques for various wounds and other illnesses.

Respected as a trailblazer in the field of surgery, *Acharya Sushruta* meticulously recorded these methods, highlighting the methodical approach and practical knowledge that characterize traditional Indian medical practices. The term '*Vrana Kovida*' is also stated in *Sushruta Samhita*<sup>1</sup>. It implies that even in those days, there were some persons skilled in treating wounds.

The present study aims to investigate the profound insights revealed in *Sushruta's Bandhana Karma*, clarifying its applicability to modern medicine and providing a more comprehensive knowledge of the historical development of surgical science. Examining the sophisticated methods described in *Sushruta Samhita*, we hope to extract knowledge that could guide current wound care practices, adding to the toolkit of medical practitioners and encouraging a mutually beneficial collaboration between traditional knowledge and cutting-edge innovation.

**Bandhana Dravya (Bandaging materials)**

Various materials are mentioned by *Acharya Sushruta* these are useful for bandaging, such as- Cloth made from *Kshauma* (flax), *Karpasa* (cotton), *Avika* (sheeps wool), *Dulukala* (inner bark of trees), *Kauseya* (silk), *Patrona* (wool of leaves), *Cheenapatta* (silk cloth), *Charma* (skin of animals), *Antarvalkala* (inner layer of barks), *Alabushakala* (pieces of Alabu), *Rajju* (rope), *Tulphala Santanika* (pad made from wool of silk cotton fruit) and metals (sheets of silver, copper, iron etc.).

These are to be used as found appropriate to the disease, time (season) etc<sup>2</sup>.

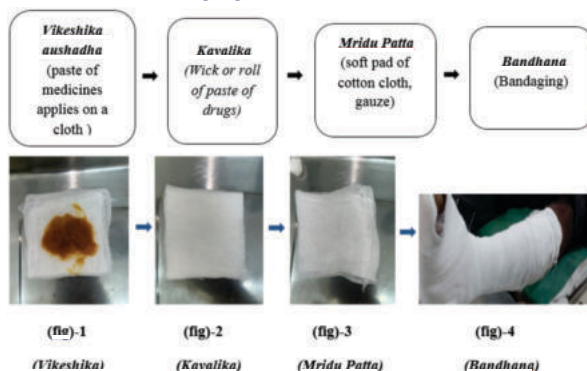
**Bandha Vishesha (Pattern of Bandaging)**

Fourteen pattern of bandaging are mentioned in *Sushruta Samhita* such as-

S.no.	Pattern of Bandaging	Indications
1.	Kosha (cocoon like)	Thumb, fingers and joints of fingers
2.	Daama (round like a belt)	For the painful parts

3.	Svastika (cruciform )	Joints, Kurchaka (area over metatarsals), between the brows, between the breasts, palms, soles and ears.
4.	Anuvellita (bent underneath, twisted)	For the extremities
5.	Muttoli (broad, winding)	Neck and penis
6.	Mandala (cicular, disc like)	Parts which are round / cylindrical
7.	Sthagika (to conceal/ hide, stump like)	Tips of thumb, finger and penis
8.	Yamaka (twin, double, with two folds/parts)	For two wounds side by side
9.	Khatva (swing, hammock like)	Lower jaw, temples and cheek
10.	Cheena (thread like, 'T' shaped)	Outer canthus of eyes
11.	Vibandha (obstructive, binding from both sides)	Back, abdomen and chest
12.	Vitana (tent like)	Head (scalp)
13.	Gophana (like horns of the cow)	Chin, nose, lips, shoulders and urinary bladder
14.	Panchangi (five tailed)	For parts above shoulders <sup>3</sup>

**Procedure of Bandaging**



In the presence of exudate: before the act of bandaging, the wound should be squeezed from its bottom and the exudate made to flow from above downwards<sup>4</sup>.

**Ideal Vikeshika Aushadha**

The paste of medicines should be neither very unctuous nor very dry or uneven. Otherwise-

S.no.	Vikeshika Aushadha	Outcomes
1.	Atisnigdhe (very unctuous)	Kleda (exudation in the wound)
2.	Atirukshe (very dry)	Chhedā (Tearing of the wound)
3.	Vishme (uneven or irregular)	Friction at the edges of the wound

So the physician should apply the wick of medicinal paste in the proper manner, knowing the nature of the wounds<sup>5</sup>.

**Trividha Bandha (three kinds of tying)**

Depending on the location (site) of wound, bandaging is mentioned of three types-

S.no.	Type of Bandha (Bandage)	Features	Indications
1.	Gaaddha (Tight)	No pain when the affected part is pressed	Buttocks, abdomen, axillae, groins, thighs and head
2.	Sama (Even / Moderate)	Allows movement of air from inside	Extremities, face, ears, throat, penis, scrotum, back, flanks, abdomen and chest
3.	Shithila (Loose)	Neither tight nor loose	Eyes and joints <sup>6</sup>

**Inappropriate Bandaging**

S.no.	Type of inappropriate bandage	Outcome
1.	If tight bandaging is done on places indicated for moderate and loose bandaging	The medicine inside the wick becomes a waste and it lead to swelling and pain.
2.	If bandage is applied loosely on the places indicated for tight and moderate bandaging	The medicine inside the wick will fall off and there will be damage to the edges of the wound due to friction.
3.	If Sama Bandhana is done on the places indicated for tight (Gaadha) and loose (Shithila) bandaging <sup>7</sup> .	There will be no effect of bandaging.

**Indications of bandaging according to vitiated Dosha**

S.no.	Vitiated Dosha	Bandaging
1.	Pitta, Rakta	a) If the wound situated on the places indicated for tight bandaging, then moderate kind of bandaging should be done. b) If situated on the places of moderate bandaging then loose bandaging should be done. c) If situated on the places of loose bandaging, then no bandaging should be done.
2.	Kapha, Vata	a) If the wound situated on places meant for loose bandaging, then moderate bandaging should be done. b) If the wound present on places of moderate then the tight bandaging should be done. c) If it is situated on places meant for tight bandaging, then the bandaging should be tighter <sup>8</sup> .

**Bandhana Kala (frequency of bandaging)**

S.no.	If Ritu (season)	& If Vitiated Dosha	Then ~ Frequency of bandaging
1.	Autumn, Summer	Pitta, Rakta	Twice in a day

2.	Winter, Spring	Kapha, Vata	Once in three days <sup>9</sup>
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**Bandha Yantrana (Knot of bandage)**

According to Acharya Sushruta, knot may be placed in three places of bandages-

S.no.	Benefits of bandaging
1.	Relief of pain, softness of skin
2.	The wounds (crushed and lacerated wounds) heal quickly.
3.	The fractures and dislocations, tearing of bones, tendons and veins heal quickly following bandaging.
4.	The wound does not cause any trouble to the patient on getting up, lying down, sleeping, walking, riding on different kinds on animals or vehicles <sup>11</sup> .

It means, the knot should not be on just above the wound or covering the wound as that may give rise to pain<sup>10</sup>.

**Bandha Guna (Benefits of Bandaging)**

When bandage is applied in the proper manner, the benefits are-

S.no.	Benefits of bandaging
1.	Relief of pain, softness of skin
2.	The wounds (crushed and lacerated wounds) heal quickly.
3.	The fractures and dislocations, tearing of bones, tendons and veins heal quickly following bandaging.
4.	The wound does not cause any trouble to the patient on getting up, lying down, sleeping, walking, riding on different kinds on animals or vehicles <sup>11</sup> .

**Bandha Abhava (Absence of bandaging)**

Following complications may occur if bandaging is not done in the conditions where required-

S.no.	Complications
1.	Many kinds of pain develop
2.	Wound may become contaminated / septic
3.	Wound will be troubled by flies, assault of grass, sticks, stone pebbles, sand , cold, wind, sunlight etc.
4.	Poultices and applied medications get dried quickly <sup>12</sup> .

**Abandhya (Contraindication of Bandaging)**

S.no.	Contraindications
1.	Accompanied with oedema, burning sensation, pus formation, red discoloration
2.	Wound caused by Kshar (Alkali) and Agni(Fire)
3.	When the tissue necrosis present and fall off by its own, suppuration of muscles
4.	Wound caused by injury and poison, rat bites
5.	Wound caused by vitiated Pitta and Rakta
6.	Wounds of leprosy
7.	Diabetic eruptions
8.	Ulceration of rectum and anal canal

It is also mentioned that the physician should decide by his own wisdom, whether to apply bandage or not<sup>13</sup>.

**DISCUSSION**

The rapid advancement of technology has led to an extraordinary array of innovative materials and techniques in wound dressing and bandages. Modern wound dressings include- films, hydrocolloids, hydrogels, foams, alginates, hydrofibers, bio-active wound dressings, tissue engineered skin substitutes, medicated dressings and 3-d printed wound dressings. These are used according to the type of wound<sup>14</sup>. All of these have technologies revolutionized the management of acute and chronic wounds. Despite these modern breakthroughs, Acharya Sushruta's age old bandaging

protocols –which are based on natural materials and practical wisdom remain relevant due to their holistic approach and possible integration with contemporary practices.

*Acharya Sushruta's* thorough explanations of bandaging procedures demonstrate the breadth of medical knowledge in ancient India as well as the usefulness and efficiency of these techniques. The emphasis on customized care, where bandages are made to fit the patient's unique needs and the type of injury, is a crucial component of *Sushruta's* method. In addition, *Sushruta's Bandhana Karma* takes into account variables like the bandage's material, wrapping direction, and pressure application in addition to the actual act of bandaging. These components show an all-encompassing comprehension of wound healing and the significance of preserving appropriate immobility and circulation. Examining sophisticated bandaging methods mentioned in *Sushruta Samhita* provides knowledge that can enhance contemporary medical procedures.

Furthermore, learning about the historical foundations of bandaging protocols helps one to have a greater understanding of how medical knowledge and practices have changed over time. To sum up, *Sushruta's Bandhana Karma* embodies a long history of surgical proficiency and innovative therapeutic innovation. We may preserve and commemorate the history of historical medical wisdom while simultaneously improving the quality of care for patients today by analyzing and modifying these antiquated methods.

## CONCLUSION

In conclusion, the study of *Bandhana Karma* as elucidated in *Sushruta Samhita* reveals a sophisticated understanding of the bandaging protocols and materials used in ancient Ayurvedic medicine. The principles and techniques outlined in the text continue to hold relevance in today's era also, offering valuable insights into holistic approaches to wound management and rehabilitation. By recognizing and appreciating these age-old practices, contemporary practitioners can also potentially integrate elements of *Bandhana Karma* into the therapeutic repertoire, enriching patient care and enhancing outcome.

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