



## Research Article

### CLINICAL EVALUATION OF THERAPEUTIC EFFECT OF *HARIDRA* (*CURCUMA LONGA* L.) IN THE MANAGEMENT OF WOUND HEALING

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#### ABSTRACT

Wound is common problems from ancient time. Wound is simply a disruption of any tissues: soft tissue or bone or internal organs. Wound may be produced by physical, chemical, thermal, microbial or immunological insult to the tissue. Although wound healing is a natural restorative response to any kind of tissue injury but due to bacterial contamination of an open wound delays the process of healing. Therefore the aim of treating a wound is to either shorter the time required for healing or to minimize the undesired consequences. In present study 16 patients with classical signs and symptoms of wound were randomly selected in OPD/IPD of Govt. Ayurved Hospital Patna. The fine powder and decoction of *Haridra* were prepared. Decoction applied externally for dressing the wound and 3gm. fine powder given orally twice a day for 30 days. The area of wound measured manually by tracing methods. The values of scores of different variables i.e. signs & symptoms recorded before & after the treatment were statistically analyzed. It is observed that the size, pain, tenderness, swelling, discharge, burning sensation, and colour of wound all were decreased with statistically highly significant value at the level ( $P < 0.001$ ). The study shows that *Haridra* having excellent properties to accelerate the wound healing safely.

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#### INTRODUCTION

The term wound is break in the continuity of soft parts of body structures caused by violence or trauma to tissues<sup>[1]</sup> In Ayurvedic classical texts term used for wound is *Vrana*<sup>[2]</sup> and defined as "The desruption/ break/ rupture/discontinuity of body tissue /a part of body'. Wound healing is a natural restorative response to any kind of tissue injury. But any further injury or infections the process of wound healing becomes prolong and complications may appear.

#### Classification of wound

In Ayurveda *Vrana* is classified as: According to aetiology *Nija* and *Agantuja vrana*<sup>[3]</sup>. Clinical classification *Suddha Vrana* and *Dusta Vrana*<sup>[4]</sup>. According to prognosis *Sadhya*, *Krichhyasadhya*, *Yapya* and *Asadhya Vrana*.<sup>[5-8]</sup>

According to modern classification wounds are classified as: tidy wound, untidy wound, acute, chronic, clean incised, lacerated, abrasion, crush injury, clean, contaminated, wound and clean contaminated etc.<sup>[9]</sup>

#### Wound healing modern view<sup>[10]</sup>

**Introduction:** Wound healing is a natural restorative response to any kind of tissue injury. Wound healing can be accomplished in one of the following two ways: Healing by first intention (primary union) and healing by second intention (secondary union).

**1. Healing by first intention (primary union):** these types of healing mainly occurs in those wound which is clean and uninfected, surgically incised, without much loss of cells and tissues, and edges of wound are approximated by surgical sutures.

The sequence of events in primary union is described below:

#### Initial haemorrhage

Immediately after injury, the space between the approximated surfaces of incised wound is filled with blood which then clots and seals the wound against dehydration and infection.

#### Acute inflammatory response

This occurs within 24 hours with appearance of polymorphs from the margins of incision. By third day, polymorphs are replaced by macrophages.

**Epithelial changes**

The basal cells of epidermis from both the cut margins start proliferation and migrating towards incisional space in the form of epithelial spurs. A well approximated wound is covered by a layer of epithelium in 48 hours. The migrated epidermal cells separate the underlying viable dermis from the overlying necrotic material and clot, forming *scab* which is cast off. By 5<sup>th</sup> day the basal cells from the margins continue to divide which forms multilayered new epidermis.

**Organisation**

By 3<sup>rd</sup> day, fibroblast also invades the wound area. By 5<sup>th</sup> day, new collagen fibrils start forming which dominate till healing is completed. In 4<sup>th</sup> week, the scar tissue with scanty cellular and vascular elements, a few inflammatory cells and epithelialised surface is formed.

**Suture tracks:** Each suture track is a separate wound and incites the same phenomena as in healing of the primary wound. When sutures are removed around 7<sup>th</sup> day, much of epithelialised suture track is avulsed and remaining epithelial tissue in the track is absorbed. Thus, the scar formed in a sutured wound is neat due to close apposition of the margins of wound.

**2. Healing by second intention (Secondary union)**

This is defined as healing of a wound which has the following characteristics:

- i. Open with a large tissue defect, at times infected,
- ii. Having extensive loss of cells and tissues,
- iii The wound is not approximated by surgical sutures but is left open.

The basic events are similar to primary union but differ in having a large tissue defect which has to be bridged. Hence healing takes place from the base upwards as well as from margins inwards. Here wound healing is slow and results in a large, at times ugly, scar as compared to rapid healing and neat scar of primary union.

**Wound contraction**

Contraction of wound is an important feature of secondary healing, not seen in primary healing. Due to the action of myofibroblasts present in the granulation tissue, the wound contracts to one-third to one-fourth of its original size. The wound contraction occurs at a time when active granulation tissue is being formed.

Detail review of wound and its management are discussed by Sushruta. During this time the knowledge of wound was on its peak level. He has also elaborated clinical presentation of wound, its pathogenesis (*Shata Kriyakala*),<sup>[11]</sup> prognosis and sixty essential procedures (*Shasti Upakrama*)<sup>[12]</sup> for management. In Ayurveda the two types of measures have been advocated for good healing.

**Vrana Shodhana**

It refers to the cleaning process of wound and is aimed to dissolve slough, debris and other unwanted agents from the wound in order to provide a healthy field for proper healing. It is done by medicaments, para-surgical or surgical methods.<sup>[13]</sup>

**Vrana Ropana**

The drug which augment the healing process are called *Vrana Ropana* drugs.<sup>[14]</sup>

Though a variety of chemical substance and formulations have been evaluated and patented as wound healing agent but ideal wound healing agent is still awaited. Various classics of Ayurveda have described the role of the *Haridra (Curcuma longa L.)* in wound healing<sup>[15]</sup>. *Haridra (Curcuma longa Linn)* is a perennial herb belong to family Zingiberaceae. The Sanskrit word *Haridra* literally means that which improves the complexion of the skin. According to Ayurveda, it is ‘spice of life’. It is a symbol of purity, prosperity and fertility. According to Sushruta *Haridra* have *Vrana Shodhak* properties which accelerate the wound healing<sup>[16,17]</sup>. The *Katu* and *Tikta Rasa* and *Ruksha, Ushna* properties of *Haridra* play important role in wound healing.<sup>[18,19]</sup>

**Aims and objectives**

To evaluate the therapeutic effect of *Haridra (Curcuma longa L.)* on wound healing.

**MATERIALS AND METHODS**

**Selection of Patients**

For the present study, 16 patients with classical signs and symptoms of wound who were attending the OPD/IPD of *Shalya Tantra* (Surgery) department of G.A.C.H. Patna, randomly selected for the study. Fine powder of and decoction of *Haridra* (dry rhizome) was prepared according to ayurvedic texts in the pharmacy wings of Govt. Ayurved College and Hospital, Patna.

**Table No.1.1 Treatments planned for wound**

Drugs	Form /Route of administration	Dose	Duration
<i>Haridra</i> (dry rhizome)	Fine powder (orally)	3 gm. twice a day	30 days
	Decoction (Externally on alternate day)	According to size of wound	

## IMAGES OF DRUGS



**Fig. 1** Dry rhizome of *Haridra*



**Fig. 2** Fine powder of *Haridra*



**Fig.3** Decoction of *Haridra*

### Inclusion criteria

1. Patients having signs and symptoms of the wound
2. Age between 16 – 60 year

### Exclusion criteria

Patient suffering from callus/tubercular/rodent ulcer, deep sinuses, diabetic, aids, cancer, leprosy etc.

### Follow Up

Alternate day.

### Local examination of wound

The wound was assessed by naked eye examination and size of wound was determined by manual tracing methods<sup>[20]</sup>

### Procedure adopted for dressing of wound

Wound was washed with decoction 4-5 times and cleaned with sterilized gauze pieces and finally wound was covered with thin gauze piece moistened with decoction of drugs. No other wound care or systemic antibiotic was provided to them.

### Diet and Restrictions

Patients were advised to follow the *Pathyapathya* available in Ayurvedic literature.

### Criteria of assessment

#### Subjective criteria

To assess the improvement or effect on subjective parameters grade/score system was designed according to severity were given marks (0-4).

#### Score system

To assess the improvement or effect on subjective parameters grade/score system was designed as below.

#### Symptoms Score/Grade

##### Size

- 0 = None
- 1 =  $\leq 4$  Sq.cm
- 2 = 4.1 - 9 Sq.cm
- 3 = 9.1 - 16 Sq.cm
- 4 = 16.1 Sq.cm and above

#### Pain

- 0 = No Pain
- 1 = Only during movement
- 2 = Localized feeling of pain even during rest but not disturbing the sleep
- 3 = Localized continuous feeling of pain and not relieved by rest

#### Tenderness

- 0 = Tolerance to Pressure
- 1 = Little response on sudden pressure
- 2 = Wincing of face on super slight touch
- 3 = Resists to touch & rigidity

#### Discharge

- 0 = Absent
- 1 = Sanguineous
- 2 = Serosanguineous : thin, watery, pale red/pink
- 3 = serous: thin watery, clear
- 4 = purulent: thin or thick, opaque, tan / yellow, with or without odour

#### Odour (Smell)

- 0 = Absent
- 1 = Bad
- 2 = Unpleasant, Tolerable
- 3 = Foul smell which is intolerable

#### Colour(Abnormal)

- 0 = Normal pigmentation of skin
- 1 = Slight red
- 2 = Reddish black
- 3 = Pale yellow/blackish/bluish

#### Burning sensation

- 0 = No burning
- 1 = little, localized & some time feeling of burning sensation
- 2 = More localized & often burning sensation which does not disturb sleep
- 3 = Continuous burning sensation with disturbed sleep

**Itching Sensation**

- 0 = No itching.
- 1 = Slight, localized itching sensation which is relieved by rest
- 2 = More localized & often itching but not disturbs sleep
- 3 = Continuous itching with disturbed sleep

**Swelling**

- 0 = Absent
- 1 = Slight red, tender & hot with painful movement & without indurations
- 2 = More red, having painful movement, with more local temperature & with indurations
- 3 = Angry look, hot, resist to touch & with more indurations

**Statistical analysis**

All information which was based on various parameters was gathered and statistical analysis was carried out in terms of Mean (X), Standard deviation (S.D.), Standard error (S.E.), Paired test (t) and finally results were incorporate in term of probability “p” as

**Table No.1.2 Criteria for assessment of result**

p > 0.05	Insignificant
p < 0.05, p < 0.01	Significant
p < 0.001	Highly Significant

**Criteria for assessment**

The assessment was done on the basis of change in signs and symptoms of wound. To assess the effect of therapy on subjective parameters, wound area, signs and symptoms level was assessed every follow up and finally after completion of treatment.

**No. 1.3 Criteria for assessment of overall effect**

Percentage of Relief	Overall effect
100%	Cured
More than 75% relief in signs and symptoms	Markedly improved
50-75% relief in signs and symptoms	Moderately Improved
25-50% relief in signs and symptoms	Partially Improved
Less than 25% relief in signs and symptoms	Unchanged

**OBSERVATION AND RESULTS**

The data collected and compiled from this clinical trial is sorted out and processed further by implying various statistical methods.. The observation found as follows:

**Table No. 1.4 Mode of onset wise distribution of 16 patients of Wound**

Mode of onset	No.	%
Sudden	12	75
Gradual	04	25

**Table No. 1.5 Cause-wise distribution of 16 patients of Wound**

Cause	No.	%
Endogenous	06	37.50
Exogenous	10	62.50

**Table No. 1.6 showing incidence of type of wounds of 16 patients**

Type of wounds	No.	%
Incised	03	18.75
Lacerated	04	25.00
Penetrating	01	06.25
Contused	00	00.00
Burn	02	12.50
Other	06	37.50

**Table No. 1.7 showing the effect of drugs on various signs & symptoms of wound**

Signs & Symptoms	Mean		% relief	± S.D.	± S.E.	't' Value	'p' Value
	B.T.	A.T.					
Size	1.43	0.18	86.95	0.68	0.17	07.31	p < 0.001
Pain	2.50	0.18	92.50	0.87	0.21	10.59	p < 0.001
Tenderness	2.50	0.62	75.00	0.71	0.17	10.43	p < 0.001
Smell	1.83	0.16	90.90	0.81	0.33	05.00	p < 0.01
Swelling	2.27	0.18	92.00	0.53	0.16	12.85	p < 0.001
Discharge	1.91	0.33	82.60	0.51	0.14	10.65	p < 0.001
Burning sensation	1.85	0.42	76.92	0.53	0.20	07.07	p < 0.001
Itching sensation	2.40	0.20	83.33	0.70	0.31	06.32	p < 0.01
Colour(Abnormal)	2.50	1.18	52.50	0.70	0.17	07.45	p < 0.001

**Table No. 1.8 Showing effect of drugs on haematological value of 16 patients of Wound:**

Haematological value	Mean		% relief	± S.D.	± S.E.	't' Value	'p' Value
	B.T.	A.T.					
Hb%	12.88	13.44	04.36	1.25	0.31	1.79	p > 0.05
ESR	10.50	09.12	13.09	2.52	0.63	2.17	p < 0.05
TLC	8156.25	7387.5	09.42	1443.01	360.75	2.13	p < 0.05
Polymorph	61.43	59.06	03.86	4.44	1.11	2.13	p < 0.05
Lymphocyte	31.06	31.18	00.40	1.78	0.44	0.28	p > 0.05
Eosinophil	05.12	03.93	23.17	1.93	0.48	2.44	p < 0.05
Monocyte	03.43	03.93	14.54	2.50	0.62	0.79	p > 0.05

**Overall effect of trial drugs****Table No. 1.9 showing the overall effect in all three groups**

Results	N	%
Cured	00	00.00
Markedly Improved	09	56.25
Moderately Improved	07	43.75
Partially Improved	00	00.00
Unchanged	00	00.00

**DISCUSSION****Discussion on subjective parameters**

As per table no.1.7 the effect of therapeutics on clinical features of wound is discussed below:

The size was decreased by 86.95% with statistically highly significant (t-07.31) value and all other signs and symptoms, pain, tenderness, swelling, discharge, burning sensation, and the colour (Abnormal) were decreased with statistically highly significant value at the level (P < 0.001).

**Discussion on objective parameters**

The mean value of objective parameters such as Hb%, T.L.C., D.L.C. etc. was slightly changed during the course of study.

**The overall effect**

The total 56.25% patients got markedly improved and 43.75% patients got moderately improvement. There was no any wound which partially improved or unchanged.

**Probable mode of action of drugs**

In the management of wound the two steps in Ayurveda are very important which are *Shodhana* and *Ropana* and they have similar concepts with modern medicine like debridement, dressing and elevation of wound. *Haridra* have some special properties by which it protect wound from infection and accelerate wound healing this can be describe as follows.

**Probable mode of action of Haridra**

The *Katu-Tikta Rasa* and *Ushna Virya* properties of it digests the *Ama* which is a causative factor of *Vrana*. The drug relieves in Pain and swelling by *Vranapachana* action. *Laghu-Ruksha Guna* of the drugs having *Kapha* pacifying action and act as a good absorber of liquid like pus so, it reduces secretion from wound. Other clinical study also proved that *Haridra* inhibit inflammation, this effect further accelerates wound healing<sup>[21]</sup> Decoction of *Haridra*

have *Vrana Shodhana* (Purification) action so that it help in debridement of wound and also prevent as well as remove infection. Dressing of wound with this decoction provide a sterile moist environment that facilitates granulation and epithelialization. It help the wound heal more quickly. Researchers have proved that the extracts of *Haridra* inhibit the growth of variety of bacteria, parasites and pathogenic fungi.<sup>[22]</sup>

**CONCLUSION**

At the end of the study, following conclusion can be drawn on the basis of observations made, results achieved It can be summarized as follows:

Though wound healing is self controlled physiological process which normally does not requires much help, but its proneness to infections which may be external or internal is of great thought. Decoction of *Haridra* have *Vrana Shodhana* (Purification) and *Ropana* action it help in debridement of wound and also prevent as well as remove infection. It helps the wound heal more quickly. The study shows that *Haridra* (*Curcuma longa Linn*) having excellent properties to accelerate the wound healing.

**REFERENCES**

1. Donald venes, Taber's cyclopedic medical dictionary 19<sup>th</sup> edition U.S.A. F.A.Devis 1997, P 2268.
2. Kaviraj Ambikaduttashastri, sushruta samhita Vol.1 (Chikitsasthan 1/6) Chaukhambha Sanskrit Sansthan Varanasi India 2007, P 3.
3. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Chikitsasthan1/3) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 1.

4. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 23/18) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 99.
5. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 23/1) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 97.
6. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 23/7) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 98.
7. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 Sutrasthan 23/8 (Chaukhambha Sanskrit Sansthan Varanasi India 2007) P 98.
8. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 23/12) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 98.
9. Bhat M Sriram SRB's manual of surgery 4<sup>th</sup> edition chapter 1, JAYPEE Medical Ltd 2012 P 1-5.
10. Mohan Harsh textbook of pathology 6<sup>th</sup> edition Jaypee brothers medical publishers (p) LTD new Delhi 2010 P 167-169.
11. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 21/18-35) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 90-93.
12. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Chikitsasthan1/8) Chaukhambha Sanskrit Sansthan Varanasi India 2007, P 4.
13. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 37/12) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 138.
14. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 37/26) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P 139.
15. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 37/20) Chaukhambha Sanskrit Sansthan Varanasi India 2007 P138.
16. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Sutrasthan 37/20) Chaukhambha Sanskrit Sansthan Varanasi 2007 P 138.
17. Kaviraj Ambikaduttashastri sushruta samhita Vol.1 (Chikitsasthan 2/73-74) Chaukhambha Sanskrit Sansthan Varanasi 2007 P 19.
18. Prof. Chunekar Krishnachandra, bhavaprakash nighantu (Haritkyadi varga/196-197) Chaukhambha bharti Akadami Varanasi 2010 P 110.
19. Dr. Tripathi Indradev raj nighantu (Piplyadi varga/199) Chaukhamba Krishnadas Akadami Varanasi 2010 5<sup>th</sup> edition, P 175.
20. Thomas AC, Wysocki AB The healing wound: a comparison of three clinically useful methods of measurement NCBI Decubitus 1990; Feb 3(1): 18-20, 24-5.
21. Julie S.Jurenka, MT(ASCP) Anti-inflammatory properties of curcumin, a major constituent of curcuma longa: A review of preclinical and clinical research. Altern Med Rev 2009; 14(2):141-153.
22. Parastoo Karimi, Parisa Karimi Alvijeh and Devendra Sharma A study of antimicrobial activity of few medicinal herbs, Asian journal of plant science and research, 2012, 2(4):496-502.

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