



**JALAUKA (LEECH) APPLICATION WITH SPLITS THICKNESS SKIN GRAFT (STSG)  
ON CHRONIC NON-HEALING ULCER-A CASE STUDY**

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**ABSTRACT**

An ulcer is a discontinuity of epithelial surface. It is characterized by progressive destruction of surface epithelium and a base may be necrotic granulating or malignant. Chronic non-healing ulcer contain unhealthy granulation tissue and slough, poor capillary bed, serosanguineous-purulent-bloody discharge, regional draining lymph nodes may be enlarged. In spite of advances (like splits thickness skin graft etc.) that have made, management of non-healing ulcer is still challenge for surgeon because there is more chance to reject skin graft in dustavrana(chronic non-healing ulcer) due to poor capillary bed and other reasons. Sushruta has described Shashthi upakramas (sixty measures) for Vranaropan. Sushruta and Vagbhatta also describe jalaukavacharan in dustavrana. So it has been use of jalauka application with splits thickness skin graft (STSG) in dustavrana(chronic non-healing ulcer). Result is coming with complete healing of dustavrana(chronic non-healing ulcer)without any complication.

**KEYWORD:** Chronic non-healing ulcer, Sushruta, STSG, Upkarmas, Jalauka.

**INTRODUCTION**

Sushruta describe, *dustavrana* is too narrow or too wide mouthed, extremely hard or soft, raised or elevated or depressed, black, red, yellow or white in color with temperature, exhibits strange and unusual features. Combined with network of vein, ligament, filled with putrid and sloughing flesh and fetid pus, indefinite and irregular in shape, Pain, Burning sensation, Swelling, Redness, Itching, Suppuration and pustules with secretion of vitiated blood.<sup>[1]</sup>

An Ulcer is a discontinuity of epithelial surface. It is characterized by progressive destruction of surface epithelium and a base may be necrotic granulating or malignant.<sup>[2]</sup> There are many types of ulcer, chronic non-healing ulcer is one of them. Chronic non-healing ulcers contain unhealthy granulation tissue and slough, poor capillary bed, serosanguineous or purulent or bloody discharge; regional draining lymph nodes may be enlarged.<sup>[3]</sup> Sushruta has described 60 *vranupakram*<sup>[4]</sup>, Charak also described 36 *vranupakram*<sup>[5]</sup>, in that *aalep*, *sandhan*, etc., describe for wound healing. Vagbhatta also describe various treatment for *gambhir vrana*.<sup>[6]</sup> Sushruta and Vagbhatta also describe *jalaukavacharan* in *dustavrana*. Sushruta also describe *Nasikasandhan vidhi*<sup>[7]</sup>, *Osthasandhan vidhi*<sup>[8]</sup> which can be beneficial in the management of *Dustavrana*.

The salivary glands of the blood-sucking leech contain an anticoagulant that not only inhibits the clotting of human and bovine plasma, but also dissolves previously formed fibrin clots. This anticoagulant activity is attributable to an enzyme, for which the name hementin is proposed. Hementin catalyzes the proteolytic degradation of fibrinogen and fibrin, even in the presence of the inhibitors of proteases occurring in human plasma. The enzyme has the same affinity for human fibrinogen and fibrin. In human fibrinogen cleaves the ACY chain initially and then the 'y' chain to yield characteristic fragments of high molecular weight that are different from the fragments resulting from the digestion of fibrinogen by plasmin. The salivary extracts do not contain any appreciable amounts of an activator of human plasminogen or an inhibitor of human or bovine thrombin.<sup>[9]</sup> Extensive thrombophlebitis and venous drainage insufficiency are frequent complications of reconstructive surgery in man<sup>[10,11,12]</sup> The application of medicinal leeches to skin flaps in animal models may serve as an effective method for relieving venous congestion. The ability of the leech to ingest blood allows venous decongestion of the surgical flap.<sup>[10,11,12]</sup> This ability results from the symbiotic relationship of the leech and *Aeromonas hydrophila*, which resides in the gut of the leech. *Aeromonas hydrophila* denatures the haemoglobin; the haem is utilized by the *Aeromonas*

organism while the globin provides a food source for the leech.

As described by *Sushruta*, Skin grafting is most useful surgical management in present era. Spilt thickness skin grafting is one of the type of skin grafting. But skin grafting may be unsuccessful for numerous reasons. The most common reason for skin graft failure is hematoma beneath the graft. Similarly, seroma formation may prevent graft adherence to the underlying wound bed, preventing the graft from receiving the necessary nourishment, as detailed above. Movement of the graft or shear forces may also lead to graft failure through disruption of the fragile attachment of the graft to the wound bed. Another common source of failure is a poor recipient site. The wound may have poor vascularity, or the surface contamination may have been too great to allow graft rejection. *Jalauka* have property to reduce hematoma, seroma, local contamination. *Jalauka* also have property to develop and maintain good vascularity of non-healing wound/ulcer. Because of this property *Jalauka* have been too great to allow graft survival and reduce rejection.

#### AIM AND OBJECTIVE

To study to reduce complication and rejection of graft with the application of *jalauka* in *dustavrana* (chronic non-healing ulcer).

#### MANAGEMENT AND OBSERVATION

Considering this condition as *dustavrana*, treated with following measures.

- 1) Primary debridement done.
- 2) After 2 days, application of *jalauka* for 4 days continuously.
- 3) After 4 days of *jalaukavacharan* very next day skin grafting perform.
- 4) Regular dressing as per skin grafting protocol for both donor and recipient area.

#### Assessment

1. Primary debridement (figure 1).
2. On 4th day of leech application – good capillary bed formed (figure-2 & figure-3).
3. On 4th post-operative day – Dressing was opened and No hematoma, No seroma, and Graft was intact well. Well develop serum imbibitions. (Figure-4).
4. On 7th post-operative day- No hematoma, No seroma, and Graft was intact well. (Figure-5).
5. On 15th post- operative day - Graft was intact well. (Figure-6).
6. On 24th post-operative day – Wound /Ulcer was completely heal.(Figure-7).
7. After 2 months.(Figure-8).

Table. 1. Composition of Leech Saliva.<sup>[13,14,15]</sup>

No.	Constituent	Function
01	Hirudin	Inhibits blood coagulation by binding to thrombin
02	Calin	Inhibits blood coagulation by blocking the binding of Von Willebrand factor to collagen; inhibits collagen mediated platelet aggregation
03	Destabilase	Monomerizing activity; dissolves fibrin
04	Hirustatin	Inhibits kallikrein, trypsin, chymotrypsin, and neuropholic cathepsin G
05	Bdellins	Anti-inflammatory, inhibits plasmin, trypsin, and acrosin
06	Hyaluronidase	Increases intestinal viscosity and antibiotic action
07	Tryptase inhibitor	Inhibits proteolytic enzymes of host mast cells
08	Eglins	Anti-inflammatory; inhibits the activity of a-chymotrypsin chymase, substilisin, elastase, and cathepsin G
09	Factor Xa inhibitor	Inhibits the activity of coagulation factor Xa by forming equimolar complexes
10	Carboxypeptidase-A	Increase the inflow of blood at the bite site of inhibitors
11	Acetylcholine	Vasodilator
12	Histamine-like	Vasodilator



Figure. 1. Primary debridement.



Figure-2 & Figure-3. On 4th day of leech application – good capillary bed formed.



Figure-4. On 4th post-operative day – Dressing was opened and No hematoma, No seroma, and Graft was intact well. Well develop serum imbibitions.



Figure-5. On 7th post-operative day - No hematoma, No seroma, and Graft was intact well.



Figure-6. On 15th post-operative day - Graft was intact well.



Figure. 7: On 24th post-operative day – Wound /Ulcer was completely heal.



Figure. 8: After 2months.

## DISCUSSION

*Dustavrana* and its management describe by *sushruta*, he also describe method *Nasasandhan* and *Austhasandhan* (skin grafting) and also describe the use of *jaluka*(leech). Leeches act by secreting biologically active substances in their saliva. This saliva, which contains a hundred or so different substances, includes an antiplatelet aggregation factor, anesthetic, and anti-inflammatory and antibiotic agent. Leech saliva also contains an anticoagulant, hirudin, which stops blood clotting and dissolves thrombi, clearing partial and complete blockages in distal arteries. When leeches bite, chemicals in their saliva dilate hosts' blood vessels and thin their blood. Simultaneously, secreting a local anesthetic masks any pain from the bite, rendering hosts unaware of leeches' presence. By ingesting excess blood, leeches reduce tissue swelling and promote healing. These microcirculatory actions enable fresh oxygenated blood to reach hosts' affected areas prior to the restoration of the normal circulation. Table 1 shows the major constituents of leech saliva.<sup>[13,14,15]</sup> Saliva of leech many contain which is helpful to develop good capillary bed, reduce inflammation, reduce ulcer contamination etc. and skin graft get faster wound healing. So, both are helpful in *dustavrana* like chronic non-healing ulcer.

## CONCLUSION

Application of leech with splits thickness skin graft is more beneficial, because leech develop and maintain good capillary bed which is helpful to graft survival, leech also decrease hematoma, seroma and other wound

contamination. These all things are very useful in graft survival in *dustavrana* (chronic non-healing ulcer). So the study concludes that application of leech with splits thickness skin graft in *dustavrana* (chronic non-healing ulcer) reduces complication and reduce rejection rate. All medical systems aim to restore those who are ill to health. Leech therapy with STG is a good example of a medical treatment valued in both complementary and conventional medicine.

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