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A RANDOMIZED CLINICAL TRIAL ON WOUND PACKING TO EVALUATE THE WOUND HEALING PROPERTY OF *JATYADI TAIL* FOLLOWING INCISION AND DRAINAGE OF *VIDRADHI* W.S.R TO SUPERFICIAL SKIN ABSCESSES

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ABSTRACT

An abscess is a collection of pus in a cavity formed by disintegrating tissue and surrounded by inflamed tissue. Abscesses can arise in any part of the body, but occur most often in the skin. '*Sheegra Vidhahitvat'* definition of *Vidradhi*[1] itself suggests virulence of disease According to *Acharya Sushruta*, if *Vidradhi* attains *Pakva avastha*, the first line of treatment is to drain pus through *bhedana karma* (incision) and later, it should be treated as a *Vrana.*[2] The study is concern with wound packing or no packing after incision & drainage of superficial skin abscesses. The objective was to determine whether the routine packing of superficial skin abscesses after incision and drainage confers any benefit, along with ascertaining the clinical efficacy of the regularly used Povidone iodine and *Jatyadi tail* in wound healing, so as to prove the best. Thirty patient were selected randomly, were divided into three groups10 patients in each group, Group A (abscess cavity was not packed after Incision & drainage), Group-B (abscess cavity packed with povidone gauze), Group-C (abscess cavity packed with *Jatyadi tail* gauze). The result shows that by packing, proper drainage will be achieved and with which the abscess cavity heals without leaving any complications. Ultimately the healing duration of the abscess cavity can be reduced and this confers that the wound packing is a necessary procedure after Incision & Drainage (I& D). On comparing the results of group B & group C this shows that the wound healing property of *Jatyadi tail* is more potent than the regularly used Povidone Iodine.

KEYWORDS: *Sheegra Vidhahitvat, Jatyadi tail, Vrana.*

INTRODUCTION

Abscesses can arise in any part of the body, but occur most often in the skin. Abscesses occur when the skin is punctured or compromised and bacteria or foreign material gets into the soft tissue below. An inflammatory response is set off as the defence mechanism of the body tries to kill the bacteria. Thus an abscess is a collection of pus in a cavity formed by disintegrating tissue and surrounded by inflamed tissue.

Abscess is understood as *VIDRADHI* in Ayurvedic classics, which is classified into 2 varieties as *Bahya* and *Abhyantara*. The present research work deals with Bahya Vidradhi for the clinical study. '*Sheegra Vidhahitvat'* definition of *Vidradhi* itself suggests virulence of disease.[1] *Sushruta* gives so much so, importance to *Vidradhi* that he includes *Puya* and *Sraava* in the definition of *Shalyatantra.*[3] *Vidradhi* word is evolved from word *Vidra*,[4] i.e. a painful condition like pricking, puncturing, stabbing the skin, these properties of *Vidradhi.*

Sushruta also mentioned that "*Nimnadarshanam Angulya Avapidite Prattyunnaman Bastavivodaka Sancharanan*"[5] means when *vidradhi* gets ripen it shows fluctuation test positive and pitting oedema. According to *Acharya Sushruta*, if *Vidradhi* attains *Pakva avastha*, the first line of treatment is to drain pus through *Bhedana karma* (incision) and later, it should be treated as a *Vrana.*[2]

Acharya Sharangdhar mentioned *Jatyaditail* in *vrana*[6]. It is said to have *Vrana Shodhana* and *Ropana* properties. To assess the significance of these properties the clinical study was carried out.

The study is concern with wound packing or no packing after incision & drainage of superficial skin abscesses. The objective was to determine whether the routine packing of superficial skin abscesses after incision and drainage confers any benefit, along with ascertaining the clinical efficacy of the regularly used Povidone iodine and *Jatyadi tail* in wound healing, so as to prove the best. Thirty patient were selected randomly, were divided into three groups10 patients in each group, Group A (abscess cavity was not packed after I & D), Group-B (abscess cavity packed with povidone gauze), Group-C (abscess cavity packed with *Jatyadi tail* gauze).

MATERIALS AND METHODS

Aims and objectives

Aims: To evaluate the wound healing property of *Jatyadi tail* following Incision and Drainage of *vidradhi* w.s.r. to superficial skin abscesses.

Objectives

- To evaluate the efficacy of wound packing.
- To assess the wound healing property of *Jatyadi Taila* over Povidone Iodine in wound healing.
- To assess the Internal comparison between A, B & C groups.

1. **Sample size:** Total 30 subjects will be randomly selected for the study, with ages ranging from 15 yrs. to 50 yrs. irrespective of sex, religion etc.

2. **Source of subjects:** OPD / IPD of Shalya-Tantra, National Institute of Ayurveda, Jaipur.

3. **Informed consent**: The study will be explained clearly to the subjects and their signed, written informed consent will be taken before starting the trial.

4. Selection criteria

1. Inclusion criteria

- Age 15 - 50 years.
- Suspected Abscess, Boils, Furuncle, Carbuncle deemed to need incision and drainage.
- Size of abscess is greater than or equal to 1cm
- Parent or patient consent

2. Exclusion criteria

- Location of abscess on face, perianal, or genitals
- Cold abscess History of recurrent or chronic abscess
- Multiple abscesses requiring drainage at current visi
- Immuno-compromised or unstable patient
- HIV, immune deficiency syndrome
- Uncontrolled diabetes mellitus
- Immunosuppressive medication

5. Lab investigation

Hb%	HIV AND HBsAg
T.L.C,D.L.C, E.S.R,	CT,BT,
FBS AND PPBS	

6. Study type: Interventional

7. Study design

Allocation: Randomized

Endpoint Classification: Safety/Efficacy Study

Primary Purpose: Treatment

30 patients were selected randomly and divided into three groups (group A, group-B and group-C) of 10 patients each.

Group A - 10 Patients- (Placebo Comparator: NO PACKING**)**

- Routinely incision and drainage procedure was done without the use of packing. Sterile gauze dressing was placed over the abscess cavity.

Group B - 10 Patients-(Control comparator: PACKING)

- Routinely incision and drainage procedure was done *and* Povidone-iodine packing loosely placed inside abscess cavity.

Group C- 10 Patients-(Experimental: PACKING)

- Routinely incision and drainage procedure was done *and Jatyadi tail* packing loosely placed inside abscess cavity.

8. Time frame: 6 weeks (1 ½ month)

9. Trial period - 1months (4 Weeks)

10. Follow up period: On 5^{th} and 6^{th} week.

Assessment criteria

The patient's response was assessed on the basis of subjective and objective criteria by assigning the suitable score to each parameter. The method adopted for scoring was as follow.

A.Subjective criteria

1. Pain (Vas scale**)**

Table no.1

Score	Explanation
0	No pain
1	Mild pain (1-3)
2	Moderate pain (4-7)
3	Severe pain (8-10)

B.Objective criteria

Primary outcome measures

Tenderness

Table no.2

0	No tenderness
1	Pain on deep palpation
2	Pain on light presser
3	Pain on touch
4	Patient does not allow palpation due to pain

Circumference[7]

Table no.3

Length x width(cm^2)	Score
0	0
<1	1
1.0 – 2.0	2
2.1 – 3.0	3
3.1 – 4.0	4
4.1- 8.0	5
8.1- 12.0	6

Depth[7]

Table no.4

Depth	Score
Non blanchable erethyma on intact skin	1
Partial thickness skin involving epidermis & / or dermis.	2
Full thickness skin loss involving subcutaneous tissue may extend down to but not through underlying fascia.	3

Exudate volume[7]

Table no.5

None	0
Small	1
Moderate	2
Large(copious)	3

Wound bed appearance[7]

Table no.6

Granulation tissue	Score
skin intact or partial thickness of wound	1
Bright beefy red,75-100% of wound filled	2
Bright beefy red <75% & 25% of wound filled	3
Pink &/ or dull dusky red &/or filled with≤ 25%	4
No granulation tissue	5

SECONDARY OUTCOME MEASURES

- Parental/patient satisfaction
  - Not satisfied-0
  - Somewhat satisfied-1
  - Extremely satisfied-2
- Time to return work

Observation and result

30 patients of *Pakva Vidradhi* were selected for this clinical study. They were treated by dividing randomly in three groups as, placebo comparator no packing (Group A), control group povidone packing (Group B) Jatyadi *tail* packing (Group C). The Age, Sex, Religion, Socio– Economic Status, Dietary Habit, Occupation etc.

Table No. 7. Effect of treatment on all parameters of Group-A

S. No.	Symptom	N	Period	Mean		% relief	S.D.	S.E.	P value	Re
				BT	AT					
1	Pain	10	DT1	2.9	1.5	48.28	0.52	0.16	0.002	V.S
		10	DT2	2.9	0.6	79.31	0.67	0.21	0.002	V.S
2	Tenderness	10	DT1	3.5	1.9	45.7	0.84	0.27	0.002	V.S
		10	DT2	3.5	0.7	80	1.3	0.42	0.002	V.S
3	Circumference	10	DT1	4.2	3.5	16.7	0.44	0.14	0.002	V.S
		10	DT2	4.2	2.4	42.9	0.42	0.13	0.002	V.S
4	Depth	10	DT1	2.8	1.8	35.7	0.47	0.15	0.002	V.S

		10	DT2	2.8	1.4	42.9	0.52	0.16	0.002	V.S
5	Exudate volume	10	DT1	2.6	1.3	50	0.45	0.14	0.002	V.S
		10	DT2	2.6	0.9	65.4	0.48	0.15	0.002	V.S
6	Wound bed appearance	10	DT1	5	4.4	12	0.53	0.18	<0.05	S
		10	DT2	5	2.3	54	0.5	0.17	<0.0001	E.S

DT1- during treatment 2nd week

DT2- after treatment 4thweek

Re- Remarks

Table No.8 Effect of treatment on all parameters of Group-B

S. No.	Symptom	N	Period	Mean		% relief	S.D.	S.E.	P value	Re
				BT	AT					
1	Pain	10	DT1	2.7	1.8	33	0.3	0.1	0.004	V.S
		10	DT2	2.7	0.6	78	0.88	0.3	0.002	V.S
2	Tenderness	10	DT1	3.7	2.5	32.4	0.63	0.2	0.004	V.S
		10	DT2	3.7	0.7	81.1	1.14	0.3	0.002	V.S
3	Circumference	10	DT1	3.9	2.7	30.8	0.42	0.1	0.002	V.S
		10	DT2	3.9	0.9	76.9	0.94	0.3	0.002	V.S
4	Depth	10	DT1	2.8	1.7	39.3	0.31	0.1	0.002	V.S
		10	DT2	2.8	0.6	60.7	0.67	0.21	0.002	V.S
5	Exudate volume	10	DT1	2.6	0.8	69.2	0.45	0.14	0.002	V.S
		10	DT2	2.6	0.1	96.2	0.57	0.18	0.002	V.S
6	Wound bed appearance	10	DT1	5	2.7	46	0.33	0.11	<0.0001	E.S
		10	DT2	5	1.3	74	0.88	0.29	<0.0001	E.S

Table No.9: Effect of treatment on all parameters of Group-C

S. No.	Symptom	N	Period	Mean		% relief	S.D.	S.E.	P value	R
				BT	AT					
1	Pain	10	DT1	2.6	1.7	34.62	0.32	0.1	0.004	V.S
		10	DT2	2.6	0.5	80.77	0.73	0.23	0.002	V.S
2	Tenderness	10	DT1	3.4	2.3	32.35	0.32	0.1	0.002	V.S
		10	DT2	3.4	0.6	82.35	0.63	0.2	0.002	V.S
3	Circumfere nce	10	DT1	4	2.1	47.5	0.71	0.22	0.002	V.S
		10	DT2	4	0.4	90	1.17	0.37	0.002	V.S
4	Depth	10	DT1	2.8	1.5	46.43	0.46	0.15	0.002	V.S
		10	DT2	2.8	0.4	85.71	0.52	0.16	0.002	V.S
5	Exudate volume	10	DT1	2.1	0.8	61.9	0.57	0.18	0.002	V.S
		10	DT2	2.1	0.2	90.48	0.45	0.14	0.002	V.S
6	Wound bed appearance	10	DT1	5	2.6	48	0.73	0.22	<0.0001	E.S
		10	DT2	5	0.5	90	0.24	0.67	<0.0001	E.S

Table No. 10. Showing % difference of individual variable in each group

S. No	Variable	% Difference in group A	% Difference in Group B	% Difference in group C
1	Pain	79.31	78	80.7
2	Tenderness	80	81.1	82.35
3	Circumference	42.9	76.9	90.0
4	Depth	42.9	60.07	85.7
5	Exudate volume	65.4	96.2	90.48
6	Wound bed appearance	54	74	90

On comparison % difference of individual variable of each group, group C shows highest % difference in pain, tenderness, circumference, depth, wound bed appearance and group B shows in exudate volume.

Overall effect of therapy

Table no.11

S.No.	Improvement	Group-A	Group-B	Group-C
1	No improvement<25%	0	0	0
2	Mild improvement -25-50%	1	0	0
3	Mordrate improvement-5075%	9	6	2
4	Marked improvement>75%	0	2	4
5	complete improvement- 100%	0	2	4

After treatment of 4th week, Four patients got 70-75% relief. Five patients got 55 to 65% relief. One patient got below 50% relief i.e. 47% in group A.

After treatment of 4th week, two patients got 100% relief. Five patients got between 65-90% relief. Three patients got between 55-65% relief in group B.

After treatment of 4th week, four patients got 100% relief, three patients got 80-95%, two patients got 70-80%, one patient got 58% in group C so in all the three groups Group-C has better results.

DISCUSSION

By observing the percentage differences of three groups after the treatment

In Group A among 10 subjects, 9 subjects got moderate relief (50-75%) and 1 got mild relief (25-50%) by Incision and Drainage without packing and in all the variables percentage of change is > 40% in circumference, depth, wound bed appearance and >65% in exudates volume, pain and tenderness;

In Group B among 10 subjects, 2 subjects got complete relief (100%), 2 got marked relief(>75%) and 6 got moderate relief (50-75%) by Incision and Drainage packing with Povidone Iodine and in all the variables percentage of change is > 60% in circumference, depth, wound bed appearance, pain and >80% in exudate volume and tenderness

In Group C among 10 subjects, 4 subjects got complete relief (100%), 4 got marked relief (>75%) and 2 got moderate relief (50-75%) by Incision and Drainage, packing with *Jatyadi tail* and in all the variables percentage of change is > 90% in circumference, exudate volume, wound bed appearance and >80% in pain, tenderness and depth.

At the end, by assessing the P value and Percentage of change in individual variable and individual subject of three groups, Group A, Group B and Group C, after treating them with their respective interventions, it was observed that most of the significant results were among Group C subjects who were intervened by Incision and Drainage followed by packing with *Jatyadi tail*.

The untoward effects observed in Group A who got treated with Incision and Drainage without packing left with ugly scar and two patients had recurrence at the same site in follow up period.

By observing the results of all variables in all the three groups (as no packing in Gr.A and Packing in Group B and Group C) Gr. B and Gr. C yielded significant results and appreciable percentage of relief over Group A. This shows that by packing premature wound closure can be prevented which allows continuous drainage after Incision and Drainage, and with which the abscess cavity heals without leaving any complications. Ultimately the healing duration of the abscess cavity can be reduced and this confers that the wound packing is a necessary procedure after Incision and Drainage. Although the packing creates minimal discomfort to the patient but gives improved outcome with good wound healing, no complications and no recurrence.

By comparing the results of Group B and Group C, the Group C has shown extremely significant results with 90% of Granulation tissue in the wound bed and the circumference of wound was reduced by 90% where as in Group B 76.9% and 74% of relief were seen respectively. This shows that the wound healing property of *Jatyadi tail* is more potent than the regularly used Povidone Iodine. Appreciable wound healing through *Jatyadi tail* explains

the involvement of drugs/contents with *Shodhan*, *Ropan*, *Lekhan*, *Vedana Ithapan*, *Krimighna*, *Ushna Veerya*, *Katu* ras and *Kapha*, *Pitta Shamak* properties. The drugs act as debriding agents by removing slough and necrotic material from the wound which enables proper healing. Wound infection will be controlled by the bactericidal property of the contained drugs[8].

The scientifically proven effects of the few of contents of *Jatyadi tail* are-
***Tuttha*[8]** - Purified blue vitriol ($CuSO_4$) induces Vascular Endothelial Growth Factor (VEGF) expression in the wound.

***Katukarohini* (Picchrorhiza kurroa):**[8] improves epithelialisation, enhances angiogenesis and migration of endothelial cell, dermal myoblasts and fibroblasts into the wound bed.

***Jati, Patola*[8]** have *Vranropana* (wound healing) property.

On the other hand, Povidone Iodine is a broad spectrum biocidal agent (bactericidal agent). The active form of which is polarized by water and hence can be considered to be H_2OI^+ in its final state. This activated iodine reacts in electrophilic reactions with enzymes of the respiratory chain as well as with amino acids from the cell membrane proteins both located in the cell wall. As a result, the well-balanced tertiary structure necessary for maintaining the respiratory chain is destroyed and the microorganism irreversibly damaged.

- **CONCLUSION:** After complete and meticulous study on 30 patients of *Vidradhi* who were divided into three groups Group A, Group B and Group C based on the type of intervention and the results were conveniently drawn comparing the effect among the three groups.
- Although Incision and Drainage (*Bhedan*) is the standard line of treatment for *Vidradhi*/uncomplicated superficial skin abscesses, there is little evidence to support the additional steps such as packing the abscess cavity, irrigation etc. The trial was done systematically to evaluate the efficacy of wound packing after performing I & D and the wound healing property of *Jatyadi tail*, complications, recurrence and pain associated with packing for both short and long duration.
- After performing Incision and Drainage under local anaesthesia the Group B, Group C in which packing done shown significant results over Group A in which packing was not done. This shows that wound packing prevents premature closure and enables proper

healing which concludes that packing is a necessary procedure after Incision and Drainage.

- On the other hand Group C who got treated with *Jatyadi tail* after Incision and Drainage yielded extremely significant results over Group B which confers that wound healing property of *Jatyadi tail* is more potent than regularly used povidone iodine.

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