Critical review on Lakshadi plaster for simple Fractures w.s.r to Bhagna

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Need for the study

Even today fractures are very common ailments due to hectic day to day activity, road traffic accidents, fall from the height etc.
Need for the study

Most of the times the surgeons face problems with simple fractures of hand, wrist, ankle, foot etc. arising not due to fracture itself but due to immobilization with POP which diminish blood flow and forms skin sores as a problem many times.
Simple fracture

Definition:

A fracture not communicating with external environment.

Or

when the overlying skin is intact
Drug Review

- Lakshadi Plaster is an “anubhoot Yoga”
- Commonly used by traditional bone setters
- Other than Dugdha Pashana and Khatika all the other ingredients are used by Acharya Sushruta for preparing splints or for immobilization of fractures.
Group – LP (Lakshadi Plaster):
- LP roll
- Soft cotton

Drug of Lakshadi Plaster:

1. Laksha (*resin of Ficus religiosa* Linn.) - 1 part
2. Aastishrinkhala (*Cissus quadrangularis* Linn.) - 1 part
3. Sudhdha Guggulu (*Comiphora wightti* Arn.) - 1 part
4. Kumari Ghana (*Aloe vera* Tourn.ex Linn.) - 1 part
5. Sudhdha Khatika (Fuller’s earth) - 1 part
6. Dugdha Padhana (Talc powder) - 1 part
Drugs of Lakshadi – Plaster

- Laksha
- Dugdha Pashana
- Sudhdha Khatika
- Guggulu
- Alovera
- Asthisrinkhala
Preparation of PLASTER

Take all ingredients of LP in powder form and in equal quantity (i.e. each 50 gms).

Add water half of total weight of dravyas then give mild heat up to the boiling.

Soak 2 – 3 cotton rolls in the mixture and then LP roll kept on surface for drying.

Reapply LP materials over the bandage, after 2-3 application and drying of roll it was kept in plastic bag.
Row materials
Grinding in mixture
Fine powder
Add water & give mild heat,

LP pasting on bandage & dry it.
Prepared LP Bandage (Roll).
Group – POP (Plaster of Paris)

- Soft cotton roll,
- POP bandage,
PLASTER APPLICATION

The affected part is washed with water.

Then soft cotton is applied over affected part and a LP roll / POP roll is soak in water & applied.

If required Bamboo splint is used (in LP group).
Apply soft cotton on Washed part

Applying LP bandage on that part

PLASTER

APPLICATION

After complete application

After 7 hrs
CLINICAL STUDY
AIMS AND OBJECTIVES

To evaluate the clinical efficacy of Lakshadi Plaster & Laksha Guggulu in the management of simple fracture in comparison to POP.
SELECTION OF PATIENTS

The diagnosed cases of Bhagna (upper and lower extremity) were randomly selected from the OPD and IPD of I.P.G.T. & R.A., as well as orthopaedic department of G.G. Hospital, Jamnagar.
Groups & Posology

Group-A
- Lakshadi Plaster.
- Duration: 4 – 6 wks.

Group-B
- Plaster of Paris.
- Duration: 4 – 6 wks.

Laksha Guggulu 4 tab (1gm) / TID, given with luke warm water in both the groups

Follow up: weekly up to 1 month after intervention
INCLUSION CRITERIA

1. Patients of Simple fractures.

2. Patient’s age group between 10 to 70 years.
## EXCLUSION CRITERIA

1. Open fractures.

2. Patients with nerves and vessels injury.

3. Infective diseases of the bone like, Osteomyelities, T.B.

4. Patients suffering with systemic disease like uncontrolled HTN, DM, Leprosy, Cancer, AIDS.
INVESTIGATION

1. Laboratory Investigations: (BT)
   1. Routine haematological investigations-
   2. Hb gm%, TLC, DLC, ESR, FBS, PPBS.
   3. URINE (routine & microscopic)

2. Radiological Investigations: (BT & AT)
   1. X – ray – Affected part, AP & Lateral view
CAUSES OF FRACTURE

- Direct Trauma: 20%
- Indirect Trauma: 66.66%
- Pathological: 0%
- Fatigue: 13.33%
- Muscular Strain: 0%

LP and POP categories are not applicable for the fatigue and muscular strain categories.


**SITES OF FRACTURES**

<table>
<thead>
<tr>
<th>SITES OF FRACTURES</th>
<th>Percentage LP</th>
<th>Percentage POP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand &amp; wrist</td>
<td>60</td>
<td>53.33</td>
</tr>
<tr>
<td>(Colle's)</td>
<td>26.67</td>
<td>33.33</td>
</tr>
<tr>
<td>Elbow &amp; fore arm</td>
<td>6.67</td>
<td>13.33</td>
</tr>
<tr>
<td>Shoulder &amp; arm</td>
<td>6.67</td>
<td>6.67</td>
</tr>
<tr>
<td>Ankle &amp; foot</td>
<td>20</td>
<td>26.67</td>
</tr>
<tr>
<td>knee</td>
<td>6.67</td>
<td>0</td>
</tr>
</tbody>
</table>

n=30
CHIEF COMPLAINTS

- **Mild Pain**: LP 6.67, POP 6.67
- **Moderate Pain**: LP 86.67, POP 80
- **Severe Pain**: LP 6.67, POP 13.33
- **Displacement**: LP 0, POP 33.33

- **LP** and **POP** represent different categories or conditions.

- **n = 30** indicates the sample size.
ASSOCIATED SYMPTOMS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortning of limb</td>
<td>0</td>
</tr>
<tr>
<td>Fever</td>
<td>13.33</td>
</tr>
<tr>
<td>Dislocation of Joint</td>
<td>0</td>
</tr>
<tr>
<td>Soft tissue injury</td>
<td>0</td>
</tr>
<tr>
<td>Ecchymosis</td>
<td>53.33</td>
</tr>
</tbody>
</table>

n = 30

ASSOCIATED SYMPTOMS

LP  POP

0  0

0  13.33

0  0

0  0

0  6.66

40  53.33

Percentage
LOCAL EXAMINATION OF FRACTURE
(INSPECTION)

<table>
<thead>
<tr>
<th>Condition</th>
<th>LP</th>
<th>POP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deformity</td>
<td>13.33%</td>
<td>40%</td>
</tr>
<tr>
<td>Abnormal gait</td>
<td>26.66%</td>
<td>20%</td>
</tr>
<tr>
<td>Swelling</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Unhealthy Skin</td>
<td>20%</td>
<td>33.33%</td>
</tr>
</tbody>
</table>
LOCAL EXAMINATION OF FRACTURE (PALPATION)

- Tenderness: 100%
- Crepitation: 33.33%
- High Tmp.: 53.33%
- Lymphadynopathy: 0%
- Passive movement: 93.33%

n = 30
WEEKLY ASSESSMENT OF SYMPTOMS

<table>
<thead>
<tr>
<th></th>
<th>LP 2 Wk</th>
<th>POP 2 Wk</th>
<th>LP 3 Wk</th>
<th>POP 3 Wk</th>
<th>LP 4 Wk</th>
<th>POP 4 Wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>41.67%</td>
<td>27.27%</td>
<td>33.33%</td>
<td>36.36%</td>
<td>25%</td>
<td>36.36%</td>
</tr>
<tr>
<td>Swelling</td>
<td>58.33%</td>
<td>27.27%</td>
<td>25%</td>
<td>45.45%</td>
<td>16.67%</td>
<td>27.27%</td>
</tr>
<tr>
<td>Tenderness</td>
<td>41.67%</td>
<td>36.36%</td>
<td>33.33%</td>
<td>36.36%</td>
<td>25%</td>
<td>27.27%</td>
</tr>
</tbody>
</table>
Effect OF Therapy

n =23

Percentage

<table>
<thead>
<tr>
<th>Condition</th>
<th>LP, n=12</th>
<th>POP, n=11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>74.28</td>
<td>71.42</td>
</tr>
<tr>
<td>Tenderness</td>
<td>73.52</td>
<td>70.96</td>
</tr>
<tr>
<td>Swelling</td>
<td>92</td>
<td>86.95</td>
</tr>
<tr>
<td>Deformity</td>
<td>75</td>
<td>71.42</td>
</tr>
<tr>
<td>Loss of function</td>
<td>83.33</td>
<td>73.68</td>
</tr>
</tbody>
</table>
TIME FOR FRACTURE UNION

n = 23

<table>
<thead>
<tr>
<th>Time</th>
<th>LP</th>
<th>POP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 wks</td>
<td>66.67</td>
<td>33.33</td>
</tr>
<tr>
<td>5 wks</td>
<td>33.33</td>
<td>16.67</td>
</tr>
<tr>
<td>6 wks</td>
<td>8.33</td>
<td>25</td>
</tr>
<tr>
<td>&gt;6 wks</td>
<td>8.33</td>
<td>0</td>
</tr>
</tbody>
</table>
Discussion on Symptoms

In this study, pain, swelling and tenderness were found in 100% of patients, as these all are cardinal symptoms of fracture.

Displacement (0/33.33), fever (13.33/0), soft tissue injury (0/6.66), ecchymosis (40/53.33) unhealthy skin (20/33.33), deformity (13.33/40) was found less number of according to cause of fracture and site of fracture.
# EFFECT OF THERAPY IN LP GROUP

<table>
<thead>
<tr>
<th>Sign &amp; Symptom</th>
<th>Mean (BT)</th>
<th>Mean (AT)</th>
<th>Diff.</th>
<th>%</th>
<th>SD</th>
<th>SE</th>
<th>‘P’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>2.92</td>
<td>0.75</td>
<td>2.17</td>
<td>74.29</td>
<td>0.39</td>
<td>0.11</td>
<td>0.0005*</td>
</tr>
<tr>
<td>Tenderness</td>
<td>2.83</td>
<td>0.75</td>
<td>2.08</td>
<td>73.53</td>
<td>0.51</td>
<td>0.15</td>
<td>0.0005*</td>
</tr>
<tr>
<td>Swelling</td>
<td>2.08</td>
<td>0.17</td>
<td>1.92</td>
<td>92</td>
<td>0.51</td>
<td>0.15</td>
<td>0.0005*</td>
</tr>
<tr>
<td>Crepititation</td>
<td>0.33</td>
<td>0.08</td>
<td>0.25</td>
<td>75</td>
<td>0.45</td>
<td>0.11</td>
<td>0.25</td>
</tr>
<tr>
<td>Deformity</td>
<td>0.33</td>
<td>0.08</td>
<td>0.25</td>
<td>75</td>
<td>0.45</td>
<td>0.13</td>
<td>0.25</td>
</tr>
<tr>
<td>Loss of function</td>
<td>1.5</td>
<td>0.25</td>
<td>1.25</td>
<td>83.33</td>
<td>0.45</td>
<td>0.13</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

n=12
EFFECT OF THERAPY IN LP GROUP

1. ‘p’ values shows statistically **highly significant result** in
   • Pain,
   • Tenderness,
   • Swelling &
   • Loss of function

2. While **insignificant result** was found in,
   • Crepitation
   • Deformity
### EFFECT OF THERAPY IN POP GROUP

*n=11*

<table>
<thead>
<tr>
<th>Sign &amp; Symptom</th>
<th>Mean (BT)</th>
<th>Mean (AT)</th>
<th>Diff.</th>
<th>%</th>
<th>SD</th>
<th>SE</th>
<th>‘P’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>2.82</td>
<td>0.72</td>
<td>2.09</td>
<td>74.19</td>
<td>0.54</td>
<td>0.16</td>
<td>0.001</td>
</tr>
<tr>
<td>Tenderness</td>
<td>2.82</td>
<td>0.82</td>
<td>2</td>
<td>70.97</td>
<td>0.63</td>
<td>0.19</td>
<td>0.001</td>
</tr>
<tr>
<td>Swelling</td>
<td>2.09</td>
<td>0.27</td>
<td>1.82</td>
<td>86.96</td>
<td>0.40</td>
<td>0.12</td>
<td>0.001</td>
</tr>
<tr>
<td>Crepitation</td>
<td>0.91</td>
<td>0.09</td>
<td>0.82</td>
<td>90</td>
<td>0.40</td>
<td>0.12</td>
<td>0.0039</td>
</tr>
<tr>
<td>Deformity</td>
<td>1.27</td>
<td>0.36</td>
<td>0.91</td>
<td>71.43</td>
<td>0.70</td>
<td>0.21</td>
<td>0.0078</td>
</tr>
<tr>
<td>Loss of function</td>
<td>1.72</td>
<td>0.45</td>
<td>1.27</td>
<td>73.69</td>
<td>0.65</td>
<td>0.19</td>
<td>0.002</td>
</tr>
</tbody>
</table>
EFFECT OF THERAPY IN POP GROUP

1. ‘p’ values shows statistically **highly significant result** in
   - Pain,
   - Tenderness,
   - Swelling

2. While **Significant result** was found
   - Crepitation
   - Deformity &
   - Loss of function
1. It was observed that in 33.33% cases the LP was removed themselves against medical advice within 4 weeks.

2. The early removal of plaster did not affect the healing of bone because Lakshadi Plaster had **vedana sthapaka, shothahara and sandhaniya** properties.

3. The p value is < 0.001 this statistical analysis shows that the treatment is effective in reliving the symptoms like pain, swelling, tenderness in both the groups.
• For immobilization of fractured bone in simple fractures the management commonly recommended is application of POP.

• The **Plaster of Paris** has no role in bone healing it is worked as the immobilization of fractured part.

• In this study, in 36.66% of patients after application of POP has got complications like, **stiffness, restricted movements of the part.**
# Lakshadi Plaster

## Advantages
- Light weight compared to POP.
- Minimal side effects due to herbal ingredients.
- Locally pain management with **Guggulu, Aloe vera,**
- Shothaghna effect of Khatika & Talc powder.
- Asthi Sandhan karma rapidly due to Laksha & Asthishrinkhala.

## Disadvantages
- Time required for setting the plaster is 6-7 hrs.
- Hence more time required for drying and achieving hardness as compared to POP.
- Only used in undisplaced fracture for immobilization.
- It can not be useful in displaced fracture, & compound fracture.
# POP

## Advantages
- Easy availability POP.
- Sitting time is less.
- Used as posterior slab for temp. support.
- Instant immobilization.

## Disadvantages
- Heavy weight,
- Stiffness of joints
- Muscle weakness,
- Diminishes blood flow,
- Formation of sores
## Differences Between LP & POP

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>LP</th>
<th>POP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ingredients</td>
<td>Herbo-mineral</td>
<td>Mineral</td>
</tr>
<tr>
<td>2.</td>
<td>Color</td>
<td>Brown</td>
<td>White</td>
</tr>
<tr>
<td>3.</td>
<td>Weight</td>
<td>50 gm (1 bandage 4&quot;)</td>
<td>110 gm (1 bandage 4&quot;)</td>
</tr>
<tr>
<td>4.</td>
<td>Cost</td>
<td>Rs. 60 (1 bandage 4&quot;)</td>
<td>Rs. 110 (1 bandage 4&quot;)</td>
</tr>
<tr>
<td>5.</td>
<td>Setting time</td>
<td>6 – 7 hrs</td>
<td>20 – 30 minutes</td>
</tr>
<tr>
<td>6.</td>
<td>Consistency</td>
<td>Bony hard</td>
<td>Stony hard</td>
</tr>
<tr>
<td>7.</td>
<td>With water</td>
<td>Not reacting</td>
<td>Heat producing</td>
</tr>
</tbody>
</table>
Probable Mode of Action..

Simple Immobilization of fractured part is much enough for symptoms like pain & tenderness.

Immobilization of fractured part properly achived by LP & POP.
Mode of action

Laksha Plaster

Kashaya Rasa

Shophagha

Vedana Sthapan

Madhur Rasa
### Probable Mode of Action of LP

<table>
<thead>
<tr>
<th>Kashaya Rasa</th>
<th>Madhur Rasa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>“ Shonita Stambhana, Kleda Vishoshana”</td>
<td>“ Dhatu Upachaya &amp; Dhatuvridhdhi”.</td>
</tr>
<tr>
<td>“ Kashayarasa Bhagnagata Rasa – Rakta vaha Shira Sankochayati”</td>
<td></td>
</tr>
</tbody>
</table>

41
Pt. No. LP/10
Fracture at base of 5th metacarpal

Pt. No. LP/13
Fracture at Radial end
Pt. No. POP/02
Collie's fracture

Pt. No. POP/04
Fracture at shaft of middle phalynx of 4th toe.
CONCLUSION

- Fracture has been experiencing by human being since their birth so it is remained as part and parcel of Human life.

- Fractures of upper & lower extremities, especially fracture of lower end of the radius is very common as compared to other regions.

- The stage we set for healing is greatly influences the speed comfort and completeness of renewal process.
CONCLUSION

• The sign and symptoms of fractures were relieved in both the groups within stipulated time.

• Lakashadi Plaster has similar efficacy in compare to POP for immobilization of fracture part.

• It can be said that Lakshadi guggulu is effective in both groups for early bone healing.
Wide range of researches are needed to establish the SOP (standard operating procedures) for Herbal Plaster.

For better evaluation of healing process single and particular fracture is to be selected for further study.

Formation of callus during bone healing should be assessed by MRI.
SPECIAL ACKNOWLEDGMENT

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Nadiad
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