

# The study of wound healing potential of Ropan tail in rats

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## Abstract

The present study was undertaken to study wound healing potential of Ropan tail. 12 male wistar rats were taken, divided in two groups, 6 rats per group Control (Normal saline) and Ropan tail. The nape of neck was shaved, they were starved overnight and on next day surgical intervention under general anesthesia was done. 500 mm<sup>2</sup> excisional wound, circular in shape was created with scalpel blade. Topical application of test drug that is Ropan tail and control was done since next day of wounding. Wound was traced with polythene paper and area was measured with help of planimeter on 6<sup>th</sup> day, 10<sup>th</sup> day, 12<sup>th</sup> day and 14<sup>th</sup> day. Two parameters were studied viz; wound contraction and period of epithelization. Ropan tail has shown statistically significant difference in wound contraction compared to control, period of epithelization was reduced by ropan tail significantly compared to control.


**Key Words:** Ropan tail, excisional wound, wound contraction, epithelization.

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## INTRODUCTION

Wound healing is a complex, delicate process which consists of series of cellular and biochemical events leading to re-establishment of anatomical continuity. Generally wounds heal without complications. There are many factors which affect wound healing. These factors may interfere with one of the phases of wound healing. There may be impaired wound healing, which leads to chronicity of wound eg. chronic anal fissure, diabetic foot wound, venous ulcers. Chronic wound requires several days of treatment to achieve satisfactory healing without complications. The need for improving impaired wound healing has resulted in continued research on wound healing in human as well as animals. Variety of drugs

have been used to treat wounds. From ancient times many herbal ayurvedic preparations have been used in the management of different types of wounds. 'Ropan Tail' is an ayurvedic preparation which has been used traditionally to promote wound healing of clean wounds. The present study was undertaken to determine the wound healing potential of Ropan tail.

## MATERIALS AND METHODS

To study wound healing property of Ropan tail experiment was conducted in two groups of male wistar rats containing 6 rats each of control and test group weighing 150gm to 250gm. Topic was approved in IAEC at Bharti Vidyapeeth Deemed University, Medical College and Hospital, Sangli. IAEC approval registration no.- BVDUMC and H, Sangli CAH/ 2015/11.

### Chemicals / Drugs and surgical material used

1. Ropan tail – Manufactured by *Shrikrishna Aushadhalaya*
2. Thiopental sodium, ethyl alcohol and Normal Saline purchased from Bharati Hospital, Sangli.
3. Surgical material: Scalpel blade, scissor, artery forcep, cotton etc.

### Methodology

It was double blinded study. Randomization was done by simple random method.

The animals bearing experimental wounds were treated with Normal Saline and Ro pan Tail randomly.

**Wounding Procedure**

The nape of neck of rat was shaved. All the rats were starved overnight with water *ad libitum* and on next day, surgical intervention under general anaesthesia was done to create excisional wound. About 500 mm<sup>2</sup> full thickness skin was excised, circular in shape with scalpel blade on the nape of the neck by using method of Morton and Malone<sup>11</sup>.

**Drug Schedule**

12 rats were wounded, 6 rats in each group received Normal saline and Ropan Tail. Drug application was done locally once daily from next day of wounding. The drug application was continued till wound completely healed as shown by total epithelization of the wound.

**Monitoring of healing**

**Excisional wounds:**

Two parameters viz; contraction of wound and epithelization period were monitored. The wound contraction was accomplished by periodical (every 4<sup>th</sup> day post wounding) recording of wound size by planimetry or by tracing the wound area on polythene paper first and subsequently on mm<sup>2</sup> paper every 4<sup>th</sup> day.. The degree of wound healing was calculated as percentage closure of the original wound area using the following formula- Percentage closure =  $A_0 - A_d / A_0 \times 100$ , Where A<sub>0</sub> = wound area on zero day, and, A<sub>d</sub>= wound area on corresponding day. The mean percentage of wound contraction and standard error of mean were calculated in control and ropan tail treated groups. The time required for epithelization was assessed in terms of days required for total fall of eschar with no trace of wound and full covering by glistening young epithelium.

**Statistical Analysis**

The level of significance between individual group was detected using unpaired ‘t’ test. Data was expressed as mean ± SEM. effects with a probability of p < 0.05 was considered to be significant. After completion of epithelization, animals were followed up by standard procedures as outlined by CPCSEA guidelines and rehabilitated.

**RESULTS**

**Ropan Tail:** Ropan tail is being used to treat clean wounds. It contains various ingredients. They are having wound healing property contributing to wound healing. Ingredients of ropan tail differ from manufacturer to manufacturer. In this study we used Ropan Tail manufactured by Shreekrishna Aushadhalaya from Ratnagiri. Wound healing property of Ropan Tail may be aided due to various actions of these ingredients.<sup>1</sup>It contains following ingredients.

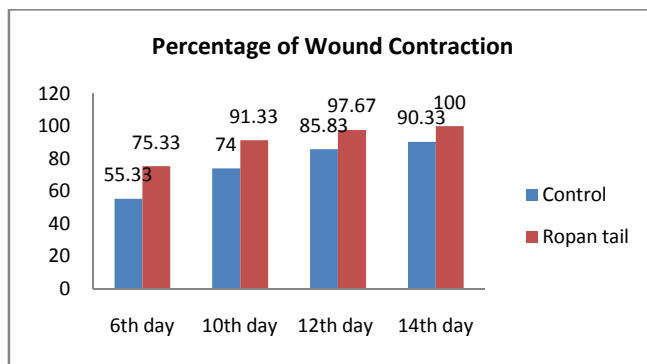
**Table 1: Contents of ropan tail**

Sr. No	Content	Family	Property
1	<i>Lodhra-A</i>	Symplocos racemosa	Wound healing <sup>2</sup> -lodhra lowers the pH of the body which gradually leads to increased wound healing <sup>1</sup> . Acts as astringent. Boosts immunity <sup>1</sup> .
2	<i>Rubia cardifolia</i> [Manjishta]-	Rubiaceae	Antibacterial <sup>3</sup> Anti-inflammatory <sup>3</sup> Anti-oxidant <sup>3</sup> Antibacterial <sup>1</sup> , Antipyretic <sup>1</sup>
3	<i>Cyperus rotundus</i> [MustaNutgram]	Cypereceae	Wound healing property <sup>1,4,5</sup> Wound healing <sup>1,6</sup> .
4	<i>Woodfordia fruticosa</i> [Dhataki]-	Lythraceae	It has antibacterial activity <sup>1,6</sup> . Wound healing <sup>1</sup> Antioxidant property. <sup>1</sup> Antipyretic andsoothens pain. <sup>1</sup> Boosts immunity <sup>1</sup> Antimicrobial activity <sup>1,8</sup>
5	<i>Glycyrrhiza glabra</i> [Lico rice]	Fabaceae	Wound healing property <sup>1</sup>
6	<i>Syzygium aromaticum</i> [Lavang/clove]-	Myrtaceae	Wound healing property <sup>1,8</sup> Anti-oxidant <sup>1,8</sup> Antimicrobial <sup>1,8</sup> Anti-inflammatory <sup>1,8</sup>
7	<i>Cinnamomum zeylanicum</i> [Dalchini]-	Lauraceae	Wound healing property <sup>1,9</sup>
8	Karpoor	-	Wound healing property <sup>1,10</sup>
9	<i>Sesamum indicum</i> oil	Pedaliaceae	Wound healing property <sup>1,10</sup>

**Table 2: Percentage of wound contraction**

Group	No of Animals	Mean Percentage Wound Contraction ± S.E.M			
		6 <sup>th</sup> day	10 <sup>th</sup> day	12 <sup>th</sup> day	14 <sup>th</sup> day
Control	6	55.33±6.04	74.00±1.63	85.83±1.167	90.33 ± 1.82
Ropan Tail	6	75.33±4.12*	91.33±2.04*	97.67±1.082 <sup>#</sup>	100*

\*= p <0.05-- significant, # = p < 0.001-- Highly significant



**Figure 1**

There was statistically significant difference in means of percentage wound contraction of Ropan Tail group when compared with Control indicating Ropan Tail has increased percentage wound contraction than Control on 6<sup>th</sup> day, 10<sup>th</sup> day, 12<sup>th</sup> day, 14<sup>th</sup> day.

**Table 3:** Period of epithelization in days

Group no.	No of Animals	Drugs	Mean Period Of Epithelization
1	6	Control	19.00±0.45
2	6	Ropan Tail	12.50± 0.22*

\*= p < 0.05 is assumed to be significant.

There was statistically highly significant difference in means of period of epithelization of Ropan Tail group when compared with Control, indicating Ropan Tail has reduced period of epithelization.

## DISCUSSION

Ropan Tail acts as a debriding agent removing slough and necrotic tissue. It reduces pain, burning sensation and itching. It also decreases discharge, redness and enhances epithelization. The ingredients of Ropan Tail have many pharmacological effects such as wound healing, analgesic, local anti-inflammatory and anti-infective.<sup>12,13,14,15</sup> There is no data suggesting that Ropan tail causes side effects as it lacks systemic absorption. Better wound healing property and lack of systemic adverse effects are the important additional advantages of Ropan tail. Ropan Tail also provides moisture to the wound hence scab fall easily without pain and residual damage.

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