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## \*Corresponding author

Dr. Dikshya Paudel  
PG Scholar; Department of Shalyatantra  
Institute of Teaching and Research in  
Ayurveda, Jamnagar-361008, Gujarat  
India  
Email: [dikshyapaudel95@gmail.com](mailto:dikshyapaudel95@gmail.com)

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## Effect of Thumari Malahara in The Management of Post-debridement Wound of Fournier's Gangrene

Dikshya Paudel,<sup>1\*</sup> Tukaram Sambhaji Dudhamal,<sup>2</sup> Kiran Kamal Bastakoti<sup>3</sup>

<sup>1</sup>PG Scholar; Department of Shalyatantra, Institute of Teaching and Research in Ayurveda, Jamnagar-361008, Gujarat, India, <sup>2</sup>Associate professor & Head; Department of Shalyatantra, Institute of Teaching and Research in Ayurveda, Jamnagar-361008, Gujarat, India, <sup>3</sup>PG Scholar; Department of Kayachikitsa, Ayurveda Campus, Institute of Medicine, Tribhuvan University, Kirtipur, Kathmandu, Nepal

## ABSTRACT

**Background:** Despite improvements in surgical techniques, suture materials, and peri-operative care, acute wound failure or dehiscence remains a dreaded surgical complication. Factors contributing to wound failure include inadequate closure, local factors like infection, advanced age, obesity, malnutrition, and local surgical site infection or hematoma. Case details: A 59-year-old patient referred from Civil hospital to Shalya Tantra OPD seeking management of post debridement wound, on 15th day after secondary suture on debrided wound of Fournier's Gangrene.

**Materials and Methods:** Sutures from the dehiscence wound (8×4×2 cm<sup>3</sup>) were removed and wound management was done by daily dressing with Normal Saline and packed with Thumari Malahara until complete healing. Triphala Guggulu 1gram three times daily and Isabgol husk 2 tablespoonsful at bedtime with lukewarm water was given for one month. The assessment was done on every 7th day on subjective criteria like Varna (Colour of margin & surrounding skin), Srava (Discharge), Vedana (Pain) and granulation tissue and objective criteria as Unit Healing Time (UHT).

**Results and Discussion:** Unit healing time was 0.437 days/cm<sup>3</sup> with significant decrease in amount of discharge, pain etc. The wound healed completely within 4 weeks of treatment. During follow up for 60 days, no recurrence was noticed. Thumari known as Securinega leucopyrus is a potential drug for wound healing. Thumari in a Malahara formulation further aids in wound healing by maintaining moist environment in wound and penetrating drugs to deeper tissue.

**Conclusion:** This case demonstrates the significant wound healing effect of Thumari Malahara along with adjuvant Ayurveda medicines in the management of post debridement wound of Fournier's Gangrene.

**Keywords:** Ayurveda, Debridement, Fournier's Gangrene, Thumari Malahara, Wound Dehiscence

## INTRODUCTION

Fournier gangrene is a surgical emergency condition. It is a fulminant form of necrotizing fasciitis of the perineal, genital, or perianal regions, commonly affecting elderly men. Fournier gangrene initially starts as an area of cellulitis. The local signs and symptoms may include intense pain and swelling. Crepitus of the inflamed tissues is a common feature because of the presence of gas forming organisms.<sup>1</sup> The mortality rate has been reported to be as high as 30% to 40%.<sup>2</sup> Surgical wound dehiscence is defined as the rupturing of opposed or sutured margins following procedure. Dehiscence can occur up to and including Day 30 post-operatively.<sup>3</sup> Wound dehiscence occurs in 1% to 3% of all surgical procedures and is more common during the first postoperative week (inflammatory phase of healing).

Technical factors can also contribute to wound failure, especially suture placement.<sup>4</sup> Older patients are more likely to experience delayed healing and surgical wound dehiscence. It is two to three times higher in patients over age 60. The epidermal and fibroblast cell's function diminishes with age. The skin becomes less elastic. There is diminished vascularity of the dermis, and the dermis atrophies, which slows wound contraction and increases the risk of wound dehiscence.<sup>5</sup> Protein catabolism delays wound healing and promotes wound dehiscence, particularly when serum albumin levels are less than 2.0 g/dL. During sepsis excess enzyme may promote dehiscence by decreasing suture-holding capacity of tissue.<sup>6</sup>

In Ayurveda *Vrana Sodhana* and *Vrana Ropana* are preliminary steps among 60 measures of wound management. In this case, *Lepa* in the form of *Malahara* is used for the application on the wound. It reduces discharge, brings *Mriduta* (softness) that is presence of moisture in wound, removal of slough that is *Putimamsa*, helps in removal of *Dosha* and helps making wound healthy.<sup>7</sup> *Thumari* known as *Securinega leucopyrus* Willd Muell. a Sri Lankan (Katupila) folklore drug, is used in the form of *Malahara* in this case. Its taxonomical description and medicinal uses are not described in Ayurvedic text. Various research studies have proven its antimicrobial, antiseptic and wormicidal properties.<sup>8</sup> Due to presence of flavonoids and tannins in abundant amount, they have antioxidant properties which not only scavenges off the free radicals, but also inhibits the generation of free radicals.<sup>9</sup> In this case, dehiscent wound which occurred after secondary suture on post debridement wound of Fournier gangrene was treated with local application of *Thumari Malahara* to achieve wound healing by secondary intention.

## CASE REPORT

A 59-year-old male patient was referred to Shalya Tantra OPD on 03/10/2022 for needful management. Patient had a history of debridement for Fournier's Gangrene 6 weeks back and secondary suture taken 2 weeks back. Even after around 15 days of secondary closure, wound was not approximated, patient was not able to mobilize and was on wheel chair due to severe pain. On examination, wound dehiscence had occurred (Fig.1). Wound was unhealthy with slough and discharge; margin was irregular and edge was sloping. Surrounding skin was congested with tenderness. The wound was not connected internally to anal canal. Regional lymph nodes were not palpable. Patient was admitted, then on first dressing all sutures were removed followed by local dressing.

## PAST HISTORY

The patient had visited emergency ward of Civil hospital on 22/08/2022 with complaints of abdominal pain, pain in scrotum, fever, nausea, chest pain and generalized weakness and breathlessness for 4-5 days. On examination, no external pus point was noticed with raised local temperature. Patient had low SpO<sub>2</sub> 90%. Conservative and symptomatic treatment were

started after blood sample was investigated where in WBC was found to be 24300/cmm, Serum creatinine 3.17mg/dl and CRP 464.2 mg/l. So, all findings and reports were suggestive of septic shock. Nebulization was done, per urethral catheterization was done. Intravenous antibiotics; Inj. Meropenem 500mg BD, Inj. Metronidazole 100mg TDS, Inj. Clindamycin 600 mg BD, Inj. Sod. Bicarbonate 125ml QID were given with other supportive treatment and Intravenous fluids like Ringer lactate solution. On 23/08/2022, patient was advised for CT scan of abdomen and pelvis where the impression was, large abscess (gas forming organism) in left ischiorectal fossa extending into left gluteal region, left scrotal sac and left inguinal region. So, patient was advised for surgery but patient denied and wanted referral to another hospital. Patient was discharged with diagnosis of Fournier gangrene and advice of surgery and needful management.

On the same day the patient was admitted to another hospital. After needful investigations and physician reference, case was posted for surgical debridement of left ischiorectal cellulitis under spinal anesthesia ASA Grade IV on 27/08/2022.

Intravenous antibiotics Inj. Piptaz 4.5gm BD, Inj. Metronidazole 100mg TDS, Inj. Linezolid 300mg BD were given for 10 days followed by Intravenous Inj. Augmentin 1.2gm BD for another 10 days.

Pus culture was done on 2/09/2022 where *Escherichia coli* was isolated, it was repeated on 08/09/2022 the same bacteria was isolated. It was repeated after four days where no bacteria were isolated and again after 5 days where no bacteria were isolated. So, secondary closure of wound was planned and done under spinal anesthesia on 20/09/2022.

## MATERIALS AND METHODS

### Drug Preparation:

**Preparation of *Thumari Malahara*:** 4 parts of *Tila Taila* (sesame oil) was taken in a steel vessel and heated over *Mandagni* (90° C to 100° C) to remove water contained in it. One part of *Thumari Kalka* was added into *Tila Taila* and subjected to heat maintaining temperature with constant stirring to avoid *Kalka* to adhere to the vessel. 16 parts of *Thumari Kwath* was prepared as per the above-mentioned procedure with *Tila Taila*. Heating was continued up to the characteristic feature of *Khara Paka Taila* (*Thumari Taila*) formed.<sup>10</sup> *Taila* was filtered while hot through a clean cotton cloth into a sterile stainless-steel container. Prepared oil was heated in steel vessel on stove and when the temperature of processed *Taila* reached to 80°C, small pieces of *Siktha* (1/5<sup>th</sup> part) was added and allowed to melt completely with continuous stirring. After complete resolving of *Siktha*, hot mixture was filtered through a clean cotton cloth into a sterile stainless container and continuous stirring was done till the contents became cool.<sup>11</sup>

### Therapeutic Intervention

**Local measures:** Daily wound cleaning was done with normal

saline and dressing was done with application of *Thumari Malahara* until complete healing (Table 1).

**General measures:** *Triphala Guggulu* 1g thrice daily and *Isabgol* husk 2 tablespoonsful at bedtime with lukewarm water was given for one month.

**Assessment Criteria:** The assessment was done on every 7th day on subjective criteria like *Varna*, *Srava*, *Vedana* and granulation tissue<sup>12</sup> and objective criteria as Unit Healing Time (UHT) for 4 weeks (Table 2, Table 3, Table 4).

**Table 1:** Timeline of Treatment

Date	Interventions
22/08/2022	Patient visited emergency ward of civil hospital with complaint of pain in scrotum, fever and generalised debility
23/08/2022	Blood investigations were done where WBCs were 24300/cmm, Serum creatinine 3.17mg/dl, CRP 464.2mg/l
23/08/2022	Nebulization, per urethral catheterization, intravenous antibiotics: Inj Meropenem 500mg BD, Inj Metronidazole 100mg TDS, Inj Clindamycin 600mg BD, Inj Sod. Bicarbonate 25 ml QID, Intravenous fluid Ringer Lactate
23/08/2022	CT Scan of abdomen and pelvis was done; large abscess (gas forming organism) in the left inguinal region, left scrotal sac and left inguinal region.
24/08/2022	Patient was discharged against medical advice (DAMA) with diagnosis of Fournier gangrene and advice of surgery and needful management
27/08/2022	Case was posted for surgical debridement of left ischio-rectal cellulitis under spinal anaesthesia ASA Grade IV
27/08/2022	Post operatively, intravenous antibiotics Inj. Piptaz 4.5gm BD, Inj. Metronidazole 100mg TDS, Inj. Linezolid 300mg BD were given for 10 days followed by Intravenous Inj. Augmentin 1.2gm BD for another 10 days.
02/09/2022	On pus culture test <i>Escherichia coli</i> was isolated
08/09/2022	On pus culture same <i>Escherichia coli</i> was isolated
12/09/2022	On pus culture no organisms were isolated
17/09/2022	On pus culture no organisms were isolated
20/09/2022	Secondary closure of wound under spinal anaesthesia
03/10/2022	Patient was referred to Shalya-Tantra OPD for needful management
03/10/2022	On admission treatment was started after removal of suture from dehisced wound
04/10/2022	Local cleaning of wound with normal saline followed by local application of <i>Thumari Malhara</i> on wound once daily was started. <i>Triphala Guggulu</i> 1g thrice daily and <i>Isabgol</i> husk 2 tablespoonsful at bedtime with lukewarm water was given for one month.
31/10/2022	Wound was completely healed

**Table 2:** *Varna* (Colour of margin and surrounding skin)

No Marginal discoloration & Normal surrounding skin	Grade 0
Mild Marginal discoloration & Mild Pigmentation in Surrounding skin	Grade 1
Moderate Marginal discoloration & Moderate Pigmentation in surrounding skin	Grade 2
Severe Marginal discoloration & Severe Pigmentation in surrounding skin	Grade 3

**Table 3:** *Srava* (Discharge)

No Discharge	Grade 0
Serous Discharge	Grade 1
Sero-purulent discharge	Grade 2
Purulent discharge	Grade 3

**Table 4:** *Vedana* (Pain)

No Pain	Grade 0
Pain on dressing change	Grade 1
Intermittent Pain	Grade 2
Continuous Pain	Grade 3

**Table 5:** *Granulation Tissue*

100% area having healthy red granulation without discharge	Grade 0
70% area having granulation with serous discharge	Grade 1
30% area having granulation with serous discharge	Grade 2
Wound having pus discharge and slough	Grade 3



## Objective criteria:

Unit Healing time (UHT)=  $\frac{\text{Total no. of days taken during treatment}}{\text{Initial area} - \text{Last area of wound (in cube. cm)}}$

## Weekly assessment of wound

**Table 6:** Subjective criteria:

Day	0	7	14	21	28
Varna	Grade-1	Grade-1	Grade-1	Grade-0	Grade-0
Srava	Grade-2	Grade-2	Grade-1	Grade-1	Grade-0
Granulation tissue	Grade-2	Grade-1	Grade-1	Grade-1	Grade-0
Vedana	Grade-3	Grade-2	Grade-1	Grade-0	Grade-0

## Objective criteria:

**Table 7:** Measurements of wound

Day	0	7	14	21	28
l×b×d (cm <sup>3</sup> )	64cm <sup>3</sup>	36.75cm <sup>3</sup>	15cm <sup>3</sup>	6cm <sup>3</sup>	0cm <sup>3</sup>

Unit Healing Time= 0.437 days/cm<sup>3</sup>

## CLINICAL IMAGES:



**Fig 1:** Day-0



**Fig 2:** Day-7



**Fig 3:** Day-14



**Fig 4:** Day-28



**Fig 5:** Follow up day-35



**Fig 6:** Follow up day-60

## RESULTS

Pain was significantly reduced from grade 3 to grade 2 in first week. Patient was ambulatory in 2<sup>nd</sup> day of dressing. Pain completely disappeared within 3<sup>rd</sup> week. Discharge got reduced from seropurulent to serous on 2<sup>nd</sup> week (Table 6). Initial size of wound was 64 cm<sup>3</sup>. Wound healed completely in 4 weeks with Unit Healing Time of 0.437days/cm<sup>3</sup> (Table 7). Proper healing from base of wound with healthy granulation was observed (Fig 3).

## DISCUSSION

With the growing old aged population and global increase in chronic lifestyle disorders such as diabetes and obesity, this may be contributing factor for occurrence of surgical wound dehiscence. Effective wound bed preparation is essential for wound healing. For wound assessment, using assessment tool like Tissue, Infection/Inflammation, Moisture, Edge (TIME) can be useful. This tool provides systematic approach to assess wound healing. *Thumari* known as *Securinega Leucopyrus* is a potential drug for wound healing. It has *Sandhankara* (repair) properties means it helps in wound contraction, *Ropana* (healing) properties that helps in healing, and *Stambhana* (retain) properties which helped to stop discharge from the wound. *Tikta Rasa* also having *Lekhana* (scrapping), *Shoshana* (absorbing) properties that dries up the pus, *Shodhana* (purify) which helps in purification of wound. *Thumari* leaf powder having large amount of tannin and oil that is helpful in the wound healing.<sup>13</sup> *Katupila* leaves possess antibacterial, anti-inflammatory and immune-modulatory activities.<sup>14</sup>

In Ayurveda, *Yogaratanakar* mentioned the term “*Malahara*” for the first time.<sup>15</sup> *Malahara* form of drug helps in healing due to its biocompatibility, as it maintains moist environment of wound thus preventing dehydration, promotes epithelialization as the base of *Malahara* is *Tila Taila* and *Siktha*. Natural essential fatty acids in *Malahara* enhance drug penetration and hastens wound healing.<sup>16</sup>

*Triphala Guggulu* helps reducing *Kleda*, *Paka*, *Putigandha*, *Sotha* along with remarkable reduction of pain at wound site.<sup>17</sup> *Isabgol* is a bulking agent which has important role in improving hygiene and decreasing discomfort with bowel movements.<sup>18</sup>

The study revealed that *Thumari Malahara* has analgesic, antimicrobial and wound healing activity.

This is a single case report. Further study in large population and exploration of healing effect of formulation in other different types of non-healing wounds are needful to add scientific evidence.

## CONCLUSION

This case study shows that *Thumari* as *Malahara* formulation along with adjuvants like oral administration of *Triphala Guggulu* and *Isabgol* has potential to heal post debrided wound of Fournier gangrene without any complications.

**DECLARATION OF PATIENT CONSENT:** It was taken from the patient before starting of the treatment protocol as well as prior to publication of the case details and pictures.

**CONFLICTS OF INTEREST:** None

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