

Management of Fournier's Gangrene by Indigenous Ayurveda: A Case Report

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ABSTRACT

Fournier's gangrene is a severe necrotising fasciitis affecting the perianal, genital and perineal regions. This rapidly progressing and potentially fatal condition involves a polymicrobial infection, causing extensive tissue necrosis. Predominantly affecting middle-aged to older adults, Fournier's gangrene presents with acute pain, swelling and redness, often accompanied by systemic symptoms like fever and tachycardia. Other risk factors include immunosuppression, chronic alcohol consumption, peripheral vascular disease, and cancer, although cases without known risk factors also occur. Diagnosis is based on clinical suspicion and confirmed through imaging tests such as ultrasound, Computed Tomography (CT), or Magnetic Resonance Imaging (MRI), which reveal soft-tissue gas or fluid collections. Laboratory tests, including blood cultures and inflammatory markers, are crucial for assessing severity and guiding treatment. Immediate and aggressive management is essential, typically involving surgical debridement, broad-spectrum antibiotics, and sometimes reconstructive surgery. Intensive supportive care is often required due to the rapid progression and risk of septic shock. In Ayurveda, Fournier's gangrene may be related to a condition called *Kotha* described in ancient texts, with treatment involving surgical excision (*Chedana karma*), wound care (*Shodhana karma*), and healing promotion (*Ropana karma*). A case report of a 68-year-old male patient highlighted the successful integration of Ayurvedic principles and modern medical interventions, resulting in complete recovery without complications. The patient's treatment included surgical debridement, the use of Ayurvedic medications for wound cleansing and healing, and antibiotics. Regular follow-up and careful wound management were crucial in achieving full recovery, demonstrating the potential efficacy of combining traditional and contemporary medical approaches in managing Fournier's gangrene.

Keywords: Excision (*Chedana karma*), Healing promotion (*Ropana karma*), Necrotising fasciitis, Wound care (*Shodhana karma*)

CASE REPORT

A 68-year-old male patient has been experiencing pain and swelling in the scrotal region for past one month, which has gradually worsened and begun radiating to the genitalia, inguinal and gluteal areas. Seeking further treatment, he visited the Shalya Outpatient Department (OPD) at the Ayurved Hospital. The patient reported intermittent episodes of fever over the past month, along with tenderness in the scrotal region, accompanied by skin discoloration in the scrotal area for the past 10 days. He has no prior history of similar symptoms. A detailed medical history revealed no history of hypertension, diabetes mellitus, substance use, or trauma/fall.

On examination, his general condition was fair, with normal blood pressure and pulse. His temperature was 99°F. Systemic examination findings included: Central Nervous System (CNS)- conscious, well-oriented, with no seizures; Cardiovascular System (CVS)- S1 and S2 sounds heard, no murmurs; Respiratory System (RS)- clear bilateral air entry; physical examination soft and non tender in the upper abdomen, with mild tenderness in the lower abdomen and genital region.

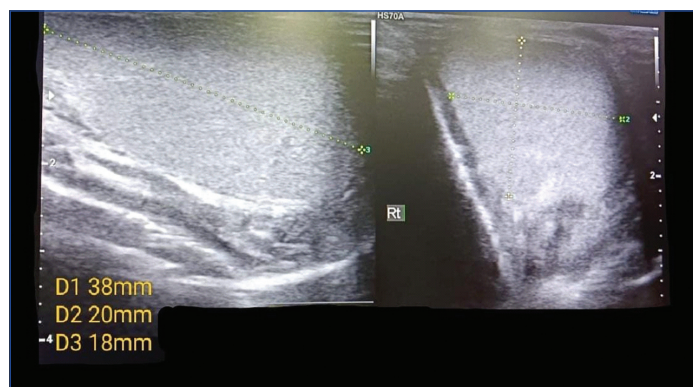
Local examination: On inspection, generalised oedema was observed in the scrotum, with an 8×6 cm swelling present on the scrotal skin. The skin appeared shiny and taut, with absent rugosity. No dilated veins or pus discharge were noted, and the penis was centrally positioned. On palpation, tenderness and a localised rise in temperature were present. Generalised non pitting oedema of the scrotum was noted. The swelling was soft in consistency, and both testes were palpable bilaterally. The 'getting above the swelling' sign was absent due to the oedema. The transillumination test was negative, while fluctuation was positive. The present case gangrenous tissue and oedema is illustrated in [Table/Fig-1].



[Table/Fig-1]: Gangrenous tissue and oedema.

Diagnostic findings: Both testes appear normal in size, shape, echotexture and vascularity. The right testis measures 38×20×18 mm, while the left testis measures 35×22×18 mm. The bilateral epididymis also appears normal in size, shape, echotexture and vascularity. There is evidence of thickened, oedematous skin and subcutaneous tissue in the bilateral scrotal wall, with hyperechoic foci and dirty

shadowing indicating the presence of gas within the tissue. No evidence of increased vascularity was observed. Signs of cellulitis were present, characterised by oedematous skin and subcutaneous tissue. Clinical correlation suggests scrotal wall cellulitis, with the possibility of Fournier's gangrene to be considered [Table/Fig-2].



[Table/Fig-2]: Ultrasonograph (USG) shows infection.

Investigations: Haemoglobin (Hb)- 12 g/dL, Red Blood Cells (RBC)- 3.25 million/cmm, White Blood Cells (WBC)- 7700/cmm, neutrophils- 80%, lymphocytes- 33%, monocytes- 4%, eosinophils- 3%, basophils- 0%, platelets- 3.81 million cells/mm³, haematocrit- 28.8%; granulocytes- 60%. Kidney Function Test (KFT) and Liver Function Test (LFT) are within normal limits. Urine examination: 1-2 epithelial cells, 1-2 pus cells, others within normal limits. Random Blood Sugar (RBS)- 100 mg%, Human Immunodeficiency Virus (HIV) test was negative, Hepatitis B Surface Antigen (HBsAg) was non reactive.

Treatment plan: Following a prompt diagnosis and assessment of the severity of the illness, *Chedana karma* (surgical debridement) was performed as per special reference in 'Sushrut Samhita', followed by *Shodhana karma* (wound care) and *Ropana karma*

(promotes healing), *sivan karma* (enclosing the wound by suturing), in addition to planned supportive care, oral medication and broad-spectrum antibiotics were provided [Table/Fig-3].

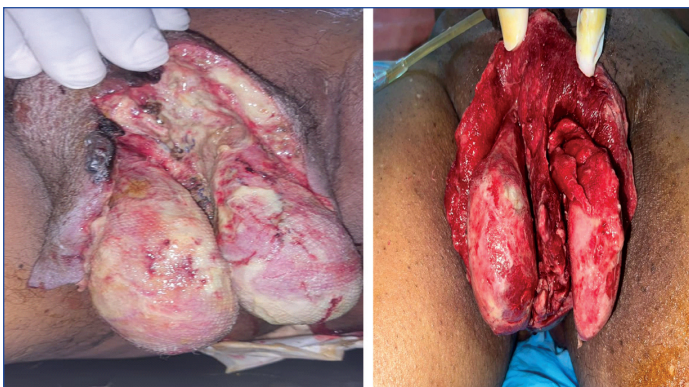
Therapeutic Intervention, Follow-up and Outcomes

Following the acquisition of informed consent and the completion of routine preoperative procedures, and after re-examining the patient locally and systemically, debridement of the gangrene was performed under spinal anaesthesia after 8 hours of nil by mouth [Table/Fig-4]. Catheterisation was carried out for several days to preserve wound health. The initial postoperative wound has been shown in [Table/Fig-5]. The Ayurvedic concepts of wound healing were applied to the treatment of the wound. Dressings were changed twice a day, which included cleaning, *dhavan* (purification with a medicated liquid), and the application of healing medicines such as *panchavalkal* and *yashtimadhu*. During each dressing, the slough on the bilateral testes and the scrotal wound was cleaned, and attention was given to the *pachan* of the *vrana*. On the 7th postoperative day, as seen in [Table/Fig-6], the slough over the testes and the surrounding area needed to be cleaned during dressing. Day by day, the health of the wounds improved as new, healthy tissue developed. The wound on the 15th postoperative day can be viewed in [Table/Fig-7]. On the 30th day, the wound's margins displayed granulation tissue and were in good condition, with little to no slough and no drainage [Table/Fig-8]. After *Shodhana* and *Ropana karma* for 45 days with internal medicine, the wound was deemed ready for closure. On the 45th day, the edges of both scrotal skins were sutured subcutaneously with Vicryl 3.0, and skin suturing was done with Ethilon 2.0 in a vertical mattress technique [Table/Fig-9]. Between the debridement and the subsequent suturing procedures, the complaints of tenderness in the genitalia and lower abdomen, as well as, fever resolved within a week. The scrotum returned to its typical state, once again rugose as usual. No further gangrenous tissue was discovered, and the redness and swelling had subsided.

Parameters	Management procedure
<i>Chedana karma</i> (Surgical debridement)	Under all aseptic precautions, under spinal anaesthesia (with NBM before the procedure), in the supine position parts were painted and draped. A vertical incision was given 2 cm parallel to the median raphe, the incision deepened in layers, and subcutaneous gangrenous tissue was excised. Aspirated a foul-smelling fluid and sent it for cultural sensitivity. Extensive skin debridement was done and the scrotum was exposed. Bilateral testis were found to be viable. Wash was given with H ₂ O ₂ and betadine. complete haemostasis was achieved, sterile dressing was done and the patient shifted to a ward for further management. Culture revealed growth of: 1) <i>Pseudomonas aeruginosa</i> 2) <i>Klebsiella pneumoniae</i> Tissue culture revealed growth of Gram-negative bacilli and pus cell Gram stain- Gram negative bacilli seen.
<i>Shodhana karma</i>	Following the debridement of gangrenous tissue, ayurvedic medication was used for wound cleansing and dressing. 1) Cleaning- with betadine solution 2) <i>Dhavan- Aragwadhadhi+panchavalkal kashayam</i> 3) Dressing- with <i>panchavalkal</i> ointment
<i>Ropana karma</i> (for healing)	1) Dressing- with <i>yashtimadhu ghrita</i>
Antibiotics with i.v. fluids (for 4 postoperative days)	1) Inj. ceftriaxone+sulbactam 1.5 gm-i.v.-12 hourly-AF 2) Inj. metronidazole 500 mg-i.v.-8 hourly-AF 3) Inj. pantoprazole 40 mg-i.v.-24 hourly-BF 4) i.v. fluid- NS, RL, DNS (2.5 litres fluid/day for 4 days at 20 drops/min)
Antibiotics and supportive medication (orally) (after i.v.)	1) Tab amoxicillin+clavulanic acid 625 mg-TDS-AF for 5 days 2) Tab pantoprazole 40 mg-OD-BF for 5 days 3) Tab chymoral forte TDS-AF for 15 days 4) Tab paracetamol 325 mg+diclofenac sodium 50 mg+serratiopeptidase 15 mg- BD-AF for 15 days
<i>Shodhana</i> and <i>Shamana</i> medication (for cleansing and healing of <i>vrana</i>)	1) Tab <i>Gandhak rasayan</i> 2BD AF 2) Tab <i>Kaishor guggulu</i> 2BD AF 3) <i>Varunadi kwath</i> 15 mL BD BF 4) <i>Musta+ Haritaki churna</i> 5 gm BD AF All medicines were given for 15 days.
<i>Sivan karma</i> (suturing)	Following 45 days secondary suturing was done on healthy edges of the scrotum. Subcutaneous by Vicryl 3.0 and skin suturing by Ethilon 2.0 in vertical mattress type.
Suture removal	After 10 days of secondary suturing, non absorbable Ethilon 2.0 sutures was removed.
Recuperation from Fournier's gangrene and full closure of the surgical incision.	Upon wound closure, the scrotum was normal, showing no gangrenous tissue, pus discharge, redness, or oedema. The medication was discontinued.

[Table/Fig-3]: Management procedure of Fournier's gangrene.

TDS: Thrice a day; AF: After food; OD: Once a day; BF: Before food; BD: Twice a day; Inj.: Injection; i.v.: Intravenous; NS: Normal saline; RL: Ringer's lactate; DNS: Dextrose and sodium chloride



[Table/Fig-4]: Evaluation of the scrotum for debridement.
[Table/Fig-5]: Initial postoperative wound. (Images from left to right)



[Table/Fig-6]: Wound at 7th postoperative day.
[Table/Fig-7]: Wound at 15th postoperative day. (Images from left to right)



[Table/Fig-8]: Wound at 30th postoperative day.
[Table/Fig-9]: On 45th postoperative day wound closure by suturing. (Images from left to right)

DISCUSSION

Fournier's gangrene is a type of necrotising fasciitis that affects the perianal, genital and perineal regions [1]. It is named after the French dermatologist Jean Alfred Fournier, who originally characterised it in 1883 [2]. Fournier's gangrene is a rapidly progressing polymicrobial infection that causes severe tissue necrosis, characterised by intense pain, swelling and systemic symptoms [3,4]. It often arises from genitourinary or gastrointestinal bacteria, requiring rapid diagnosis and aggressive treatment [5].

Ayurveda, the oldest medical science, offers foundational principles for managing various conditions, including Fournier's gangrene. Acharya Sushrut described *Avastha vranshoth* and *Kotha*, defining *vranshoth* as swelling between the skin and muscle that progresses through stages. He emphasised excision for *Kotha* and essential *Pachana karma* for effective wound management [6-8]. Within Ayurveda, this ailment is referred to as *Kotha*, and it is clarified that *Kotha* should be excised [9].

In the *Chhedya rog Pratishedh Adhyay*, Acharya Sushrut has provided some conditions for the *Chhedan* process. The first is

samya *chhedan*, followed by *hina chhedan*, etc., *Samyak Chhedan* refers to the amount we may excise without complications. *Vishudhdha varnam* (no abnormal discolouration) and *aklishtam* (without any remaining debris) are the main signs of *Samyak chhedana* (proper excision) [10]. Incomplete excision in *Hina Chhedan* leads to an increase in the disease. Additionally, the second criterion is for pain management after excision; drug such as *yashtimadhu*, *amalaki* and *karanjibija*, should be used. The third criterion involves a scrapping process for removing any remaining tissue [10]. Following these indications and criteria, *Chhedana karma* was performed.

According to Meena G et al., the use of Ayurvedic formulations along with modern medicine after surgical debridement helped in early granulation and reduced bacterial load count. This case involved early surgical debridement, daily wound cleaning with *Nimbadi Taila*, and the application of *Jatyadi Taila* for healing. Scrotoplasty was performed after 6 weeks, leading to significant improvement [11].

The treatment of Fournier's gangrene requires a comprehensive approach that includes intensive systematic management, broad-spectrum antibiotic therapy, and early surgical debridement. This involves the removal of necrotic tissues and the surgical drainage of the peritoneum, scrotum, penis and inguinal regions [12].

Interaction of different medications: Tablet *Gandhak rasayan* effectively eliminates microorganisms from wounds and reduces associated weakness, acting as a powerful *Kushtaghna* and promoting faster healing. *Kaishor guggulu* balances the doshas and heals all wounds, while *Varunadi kwath* addresses abscess formation. *Musta* and *Haritaki churna* purify the blood and support healing, while *Aaragvadhadi* and *Panchavalkal kashayas* enhance wound recovery [13].

These Ayurvedic treatments focus on holistic healing, addressing underlying imbalances rather than just symptoms. They often have fewer side-effects compared to conventional medications and support overall health. Additionally, Ayurvedic remedies can enhance the body's natural healing processes, potentially leading to more sustainable recovery. While Ayurveda is generally safe, potential complications may include allergic reactions or interactions with other medications. However, the prognosis is usually favourable, as Ayurvedic treatments often emphasise long-term health and disease prevention. Regular follow-ups and a comprehensive approach to health can further improve outcomes and reduce the likelihood of recurrence.

CONCLUSION(S)

In the present case of Fournier's gangrene, the patient received surgical debridement and Ayurvedic wound care according to the principles of the 'Sushrut Samhita'. The treatment included cleansing, Ayurvedic dressing, antibiotics and secondary suturing. Gradual wound healing and full recovery were achieved through comprehensive care, highlighting Ayurveda's potential in managing severe infections alongside conventional methods.

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PLAGIARISM CHECKING METHODS: [\[Jain H et al.\]](#)

- Plagiarism X-checker: Jul 20, 2024
- Manual Googling: Sep 14, 2024
- iTenticate Software: Nov 02, 2024 (6%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: Jul 19, 2024

Date of Peer Review: Sep 17, 2024

Date of Acceptance: Nov 05, 2024

Date of Publishing: Feb 01, 2025