

Case Report



Integrative Management of Chronic Osteomyelitis (Asthi-Majjagata Vidradhi–Nadivrana) of the Great Toe: A Case Report

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ABSTRACT:

Background: Osteomyelitis is an inflammatory condition of bone begins as an infection of the medullary cavity, haversian system and extends to involve the periosteum of affected area. Causes like trauma, ischemia, foreign body can make bone susceptible for the infection. Key steps in management includes, surgical removal of infected bone and extended antibiotic therapy. However chronic and recurrent cases are more challenging to treat. Hereby an attempt is made to treat such chronic condition of 22-year-old history of osteomyelitis with integrated approach to support postsurgical recovery and to prevent recurrence; as such cases are rarely documented. **Case presentation:** A 55-year-old, male with chronic non-healing wound at base of left great toe presented with pus discharge, foul smell having history of trauma 22 years ago and underwent wound debridement twice, but symptoms persisted with discharging sinus resulting into chronic osteomyelitis. **Intervention:** Management includes amputation, antibiotics, local wound debridement with *Apamarga ksharajala* (caustic water), *Priyangvadya Taila* (oil) and internal medications like *Mahamanjishtadi Kashaya* (decoction), *Arogyavardhini Vati* (tablet), *Panchatikta ghrita guggula* (tablets). Patient was monitored for infection control, wound healing, pain reduction and improvement in quality of life. **Outcome:** The integrated approach led to significant clinical improvement showing reduced infection, healthy granulation tissue formation and pain control. Improvement in quantitative parameters was seen through reduced WBC, ESR count with complete healing of wound within 50 days and no recurrence or complications noted during follow up. **Conclusion:** Present chronic osteomyelitis case was managed through integrative approach combining Amputation, intravenous antibiotics along with ayurvedic intervention internally (*Panchatikta ghrita guggula*, *Mahamanjishthadi Kashaya*, *Arogyavardhini vati*) and externally (*vrana-lekhana*, *dhoopana*, dressing with medicated oil) given over a period of 50 days. Chronic cases like osteomyelitis in which recurrence chances are more and has showed limited response to allopathy management alone can be treated with integrated approach. This case highlights integration of standard surgical management with ayurvedic wound therapies can promote early recovery and prevent recurrence in chronic conditions.

KEYWORDS: *Asthi-Majjagata Vidradhi*, Case Report, Chronic osteomyelitis, Integrative approach, Nadivrana, Wound Healing

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1. INTRODUCTION

The word osteomyelitis contains root words as osteon (bone), myelon (marrow), which is an infection of bone or bone marrow. Complaints include swelling, skin discoloration, non-healing discharging ulcer or sinus tract with severe pain, fever. Total 500 cases of osteomyelitis of various bones were studied for a etiology, pathology and presentation from 1963 to 1979. [1] Hematogenous spread affects bone through bacterial infection from distant source, contiguous dissemination from surrounding joints and tissues or direct injection from trauma or surgery. [2] Management includes extensive debridement, saucerization and wound packing following which the affected area is left to heal by secondary intention. [2] *Asthi-Majja Vidradhi* is word used when pus exclusively builds up in bone (*Asthi*) or bone marrow (*Majja*). [3] Management of *vidradhi* in *Ama* (unripe stage) *Avastha* includes both internal and external therapies directed at controlling inflammation and swelling. Once it progresses to stage of pus formation (*Pakwa avastha*), surgical procedures in the form of incision and drainage has to be introduced. [4] The recurrence of infection, poor antibiotic penetration and systemic complication necessitate the exploration of integrated and adjunctive treatment approaches which will be helpful in prevention of infection and support healthy granulation. Very few reports emphasize the integration of ayurvedic *Shashti upakrama* principles with conventional surgery in chronic osteomyelitis. Considering chronicity and fatality of osteomyelitis, this case report highlights effectiveness of integrative treatment in management

and early recovery of chronic conditions like osteomyelitis.

2. CASE REPORT:

A 55-year-old labor worker presented to OPD on 15/04/2025 with a chronic wound at base of left great toe associated with pus discharge, foul smell, difficulty in walking along with intermittent fever for 3 years. He was not a known case of DM or HTN and had no history of smoking, alcohol or tobacco use as well. There was no any relevant family history. Patient was well built (BMI-26), engaged in heavy manual labor, used unprotective footwear and belonged to a low socioeconomic background. Previously he had history of road traffic accident-related trauma at same site 22 years earlier. Repeated occupational trauma led to ulceration with a discharging sinus. Despite of previous 2 surgical debridement with IV antibiotics, symptoms persisted. Left great toe amputation (Gillie's method) was carried out on 17/04/2025. Investigations showed raised WBC and ESR with normal glycemic profile and Doppler flow.

Clinical findings: On general examination patient was well oriented with stable vital parameters: blood pressure-118/80mmhg, pulse rate-18/min, temperature-98.2⁰ F with no pallor, icterus, cyanosis, lymphadenopathy, pedal oedema. Systemic examination revealed no abnormality.



Figure 1: wound presentation at time of admission which shows deformed greater toe with discharging osteomyelitic sinus. a) dorsal aspect b) plantar aspect.

Inspection (figure 1):

1. Site: base of greater toe
2. Shape: oval
3. Color: pale whitish yellow
4. Smell: foul
5. Size of ulcer- 1*1 cm
6. Margin- irregular
7. Discharge: Mild, mucoid watery
8. Erythema- absent
9. Surrounding area: whitish
10. Deformed shape and shortening of left greater toe in comparison with right greater toe, suggestive of chronic infection and underlying bone destruction

Palpation:

1. Whitish frothy mucoid discharge
2. Deep seated tenderness over the distal phalanx and surrounding soft tissue.
3. Increased warmth over affected toe.
4. Induration - absent.
5. Crepitus- absent.
6. probe-to-bone test- positive

7. Peripheral pulses (dorsalis pedis and posterior tibial)- present
8. Capillary refill time- < 2 seconds

X-Ray (figure 2)



Figure 2: X-ray of the left foot before amputation showing osteomyelitis changes: (a) Anteroposterior (AP) view, (b) Oblique view.

Discharge swab for culture- sensitivity was sent on 2nd day of admission along with microbiology examination which showed primary organism *Streptococcus agalactiae*. Antibiotic sensitive was piperacillin (25mm) hence was advised.

Diagnostic assessment: Considering past traumatic history, clinical features, imaging and microbiological results overall presentation was consistent with chronic osteomyelitis. X-ray of affected part (figure 2) showed areas of bone destruction with dense sclerotic areas and sequestrum. MRI could not be performed due to cost factor, though x-ray provided adequate details for planning surgical intervention. Post amputation HPR was also suggestive of chronic osteomyelitis with exuberant inflammatory granulation tissue. Hence diagnosis confirmed as chronic traumatic osteomyelitis. According to *Ayurveda*, signs and symptoms are best matched with *Asthimajjagata vidradhi Nadivrana*. Ruled out diagnosis presented in table 1.

Table 1: Differential diagnosis ruled out

Differential diagnosis	Reasons for inclusion	Reasons for exclusion
Gouty arthritis	Site first metatarsophalangeal joint, increased warmth at affected site, fever- on and off	History of trauma, persistent discharging sinus without acute inflammation. Serum uric acid: normal (4.5mg/dl)
Cellulitis	History of recurrent trauma, Localized pain, increased warmth at affected site, fever- on and off	Deep bone tenderness present, no redness, no swelling, pain mild, presence of ulcer with sinus tract.
Soft tissue abscess	Localized pain, open wound, increased warmth, fever- on and off	absence of soft fluctuating area, erythema- absent, discharge- serous, presence of ulcer with sinus tract
Tubercular osteomyelitis	Chronic non healing ulcer with sinus tract, clear discharge	Not associated with constitutional symptoms like weight loss, no lymphadenopathy, negative chest x ray, Culture- negative for <i>Mycobacterium tuberculosis</i>

Expected prognosis and recurrence risk: Cierny-Mader stage 4 confirmed poor prognosis which indicates chronic infection requiring surgical intervention. As the recurrence rates for similar integrative treatment are less than 5%, lower than that of standard treatment protocol.

Intervention:

Comprehensive treatment protocol includes amputation, antibiotics, local wound debridement with

Apamarga ksharajala (caustic water), dressing with *Priyanguvadya Taila* (oil) and internal medications is presented in table 2. Modern treatment approach was guided by the Cierny-Mader classification – “stage 4(BI)” [5] of osteomyelitis and post-operative wound assessment was performed using the Bates Jensen technique (Tables 3 and 4) for 50 days.

Table 2: Intervention of External and oral therapies

Plan of care	Name of intervention	Route and frequency of administration	Duration (days)									
			1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	40-50	
Modern intervention												
Amputation of greater toe (<i>Chedana</i>) (figure 3) (17/04/2025)	Amputation (picture:3)		✓									
Crepe bandage till knee joint for DVT	Crepe bandaging		✓									

prophylaxis (<i>Bandhana</i>)												
Antibiotics (Inj.piptaz 4.5gm) (17/04/2025) to (23/04/2025)	Inj. Piptaz 4.5 gm (piperacillin 40000mg+ tazobactum 500mg) (Abbott pharmaceuticals Batch no- V556066)	IV 8 th hourly	✓									
(17/04/2025) to (23/04/2025)	Inj. Pantoprazole 40 mg (Alkem pharmaceuticals Batch no: ND-21249C)	IV BID	✓	✓								
(17/04/2025) to (23/04/2025)	Inj. Tramadol 100mg (Zydus healthcare Ltd. Batch no-PA31002)	IV BID	✓	✓								
Ayurvedic intervention												
<i>Vrana</i> <i>lekhana</i> (scraping) (17/04/2025) to (02/05/2025)	with <i>Apamarga ksharajala</i> (PH: 8.5) (manufactured in KLE ayurveda Pharmacy Batch no-1)	once daily contact time: 100 <i>matra</i> (9 seconds) neutralization: by lemon juice followed by NS wash	✓	✓	✓							
<i>Vimlapana</i> (gentle, circular massage around the wound) (03/05/2025) to (04/06/2025)	With <i>Jatyadi taila</i> (Manufactured by- KLE Ayurveda pharmacy Mfg date- march 2025 Exp date-february 2028 Batch no- 02)	once daily for 10 minutes				✓	✓	✓	✓	✓	✓	✓
<i>Vrana dhoopana</i> (wound fumigation) (28/04/2025) to (13/05/2025)	<i>Nimba, Vacha, Hingu, Ghrita,</i> <i>Sarshapa, Lavana</i> each 3 gm	once daily For 10 minutes			✓	✓						
(28/04/2025) to (04/06/2025)	<i>Panchatikta ghrita guggula</i> (Manufactured by- KLE Ayurveda pharmacy	250mg, 2 tablets BID, A/F, with			✓	✓	✓	✓	✓	✓	✓	✓

		Mfg date- march 2025 Exp date-february 2028 Batch no- 01)	warm water									
(17/04/2025) (08/05/2025)	to	<i>Mahamanjisthadi Kashaya</i> (Manufactured by- KLE Ayurveda pharmacy Mfg date- March 2024 Exp date- February 2034 Batch no- 02)	15 ml BID, B/F, with warm water	✓	✓	✓	✓	✓				
(17/04/2025) (08/05/2025)	to	<i>Arogyavardhini vati</i> (Manufactured by- Dhootapapeshwar pharmacy Mfg date- March 2025 Exp date- February 2030 Batch no- DU522511)	250mg, 2 tablets BID, A/F, with warm water	✓	✓	✓	✓	✓				
Dressing (03/05/2025) (04/06/2025)	to	<i>Priyanguvadya taila</i> (Manufactured by- KLE Ayurveda pharmacy Mfg date- March 2025 Exp date- February 2028 Batch no- 02)	Once daily				✓	✓	✓	✓	✓	✓
BID = Twice a day A/F = After Food B/F = Before Food												

{IV-Intravenous, A/F-After food, B/F-Before food, BID-Twice a day, Exp date-Expiry date, Mfg date-Manufacturing date)



Figure 3: Presentation at the time of amputation: (a) Site of amputation, (b) Amputated part.

Table no 3: Assessment of various Wound parameters by Bates Jensen criteria

Sr no	Wound parameters	Assessment of wound parameters in Days								
		1-5	6-10	11-15	16-20	21-25	25-30	31-35	36-40	41-50
1	Size	4	4	4	3	3	3	2	1	0
2	Depth	5	5	4	4	3	2	1	1	0
3	Edges	3	3	2	2	2	2	1	1	0
4	Necrotic tissue	3	0	0	0	0	0	0	0	0
5	Exudate type	5	5	4	3	3	2	1	1	0
6	Exudate amount	5	4	4	3	2	2	1	1	0
7	Skin Colour Surrounding Wound	5	5	4	4	3	3	2	2	1
8	Peripheral Tissue oedema	5	5	4	3	2	1	1	0	0
9	Peripheral Tissue Induration	3	3	2	2	2	2	1	1	0
10	Granulation tissue	5	4	4	3	3	2	2	1	0
11	Epithelialization	5	5	4	4	3	2	2	1	0
	Total score	48	43	36	31	26	21	14	10	1

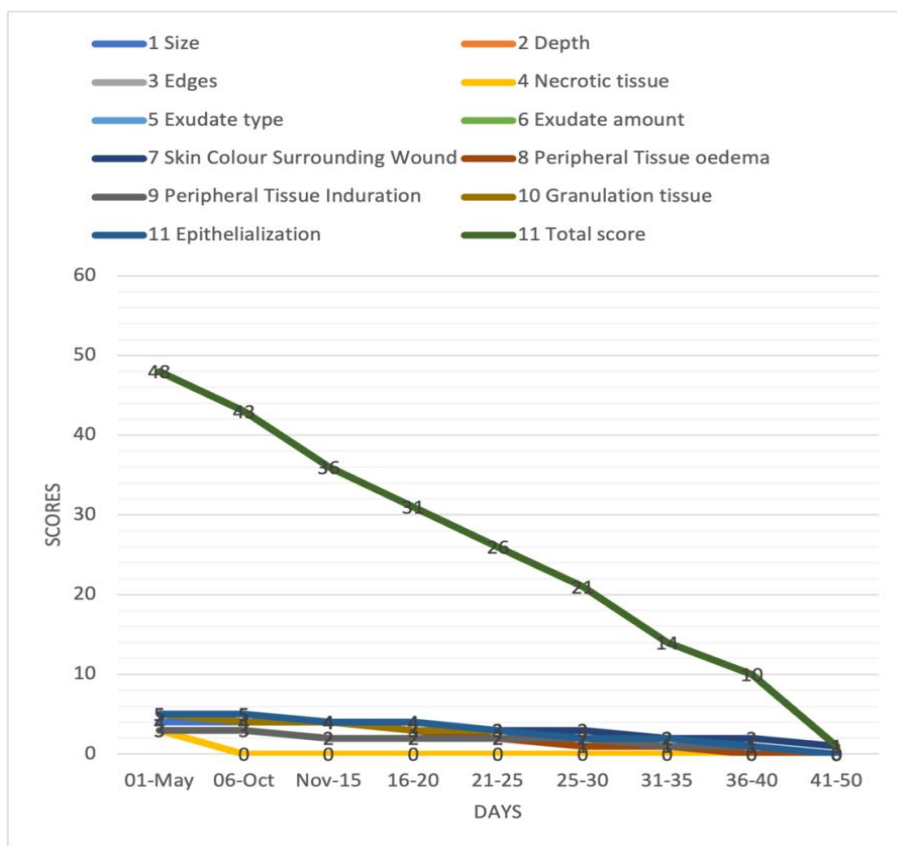


Figure 4: Line graph showing the healing trend of each wound parameter over time

Timeline

Table no. 4- Clinical Timeline of the case

Date	Clinical events	management	Clinician assessed outcome	Patient reported outcome	Laboratorial outcome
24/04/2024	Wound at base of left greater toe with pus discharge	Local debridement	Consistent pus discharge after 10 days	1.Pain at affected site (VAS- 7) 2.Difficulty in walking	-
17/04/2025 to 26/04/2025	Wound at base of left greater toe, pus discharge, foul smell, difficulty in walking	1.Amputation of greater toe (<i>Chedana</i>), 2.Antibiotics (Inj.piptaz 4.5gm) 3. <i>Vrana lekhaana- Apamarga ksharajala</i> 4. <i>Arogyavardhini vati</i>	Pus discharge reduced, no foul smelling	1.Pain at operated site (VAS- 9) 2. unable to walk due to pain	ESR-64 mm/hr WBC- 14000/mL
27/04/2025 to 07/05/2025	Amputated wound with discharge, pain at site	1. <i>Vimlapana- Jatyadi taila</i> 2. <i>Vrana dhoopana</i> 3. <i>Arogyavardhini vati</i> 4. <i>Mahamanjsthadi Kashaya</i>	Mild pain, mild discharge with sinus tract- 4cm	1.Able to walk with mild pain (VAS- 4)	-
08/05/2025 to 18/05/2025	Persistent sinus with discharge, mild pain	1. <i>Vrana dhoopana</i> 2. <i>Vimlapana- Jatyadi taila</i> 3. <i>Panchatiktaka ghrita guggula</i> 4.Dressing- <i>Priyangvadya taila</i>	Pain reduced, Sinus tract- 2cm, mild discharge	1.Able to walk with mild pain (VAS- 3)	ESR- 24 mm/hr WBC- 9000/mL
19/05/2025 to 29/05/2025	Persistent sinus with mild discharge	1. <i>Vimlapana- Jatyadi taila</i> 2. <i>Panchatiktaka ghrita guggula</i> 3.Dressing- <i>Priyangvadya taila</i>	Sinus tract- 1cm, no discharge	1. mild pain (on and off) while walking (VAS- 1)	-
30/05/2025 to	Small sinus tract	1. <i>Vimlapana- Jatyadi taila</i> 2. <i>Panchatiktaka ghrita</i>	Sinus tract closed, no discharge,	1.no pain (VAS- 0)	ESR-11 mm/hr

06/06/2025		<i>guggula</i> 3.Dressing- <i>Priyangvadya taila</i>	healthy suture line	2. can do daily activities without any difficulty	WBC- 7000/mL
09/06/2025	Completely healed wound	-	-	1.no pain (VAS-0) 2. can do daily activities without any difficulty	-

Follow up and outcome:

Initially patient was followed up every 7 days for 1 month with dressing (by *ksharajala* followed by *priyangvadya taila*) and *vranadhoopana* once daily for 10 days along with internal medications. Wound was monitored for discharge, granulation tissue and pain control which was evidently achieved on 50th day. Detailed observations are mentioned in table-4 and figure 4 and 5.



Figure 5: Progression of the wound over time (plantar and dorsal aspects): (a) Day 2, (b) Day 30, (c) Day 50.

Adverse events, Adherence and tolerability: Patient tolerated procedure and followed post operative management protocol without any adverse effects. Patient was monitored for local and systemic

parameters. Progressive wound healing was noted with no signs of recurrence.

3. DISCUSSION:

Osteomyelitis is known for delayed healing and recurrence. Long-standing comorbidities like diabetes mellitus, peripheral vascular disease, neuropathy, smoking along with nutritional deficiencies, contribute to chronicity and its recurrences. Fasting glucose, HBA1C and lipid profile of this patient was checked previously and found to be within normal limits. Patient had no history of smoking or alcohol use. Arterial and venous Doppler study was also done which was found to be normal. There were no clinical features suggestive of neuropathy. Generally, the recurrence rate for chronic osteomyelitis following conventional management is around 20.8-25.9% in clinical practice. [6] In this present case, there is a strong chance that the recurrence following amputation probably due to long-standing occupational stress, continued heavy weight-bearing, repeated trauma aggravated by improper footwear habits, inadequate debridement and also suboptimal wound care at the local level. All these factors contributed towards impairment of local tissue and

increased vulnerability to infection or ulcer formation. After surgical intervention, integrative Ayurvedic care was initiated in order to enhance wound healing, local tissue-regeneration and boosting systemic strength. Local wound management was done effectively to favourably alter residual local pathology. Additionally, systemic approach was incorporated into therapy in order to counter systemic level predispositions and pathological processes that favour recurrence. In this way, further recurrence was prevented and sustainable pattern of recovery could be established.

These favourable outcomes highlight that *Shashti Upakrama* taken together with the modern treatment worked well to reduce the chronic discharging sinus (Table 2). Amputation (Figure 3) ensured definitive source control while administered intravenous antibiotics aided in control of post-operative infections. DVT prophylaxis was administered due to risk of postoperative inflammation and immobilization. Herbal formulations administered having *Kandughna* (treating itching), *Vranaropana* (healing wounds) and *Raktashodhaka* (purifying blood) properties in order to promote healing internally as well as externally.

By the 5th postoperative day, partial healing was observed but 10% of the wound had a serosanguinous discharge (Figure 5). This wound then started acting as a discharging sinus tract. It was treated as per *Shashti Upakrama*. *Pratisarneeya kshara* having *Chedana* (excision), *Bhedana* (incision), *Lekhana* (scraping) and *Tridoshahara* properties. Preferred *pratisarneeya kshara* was *Apamarga kshara*. [7] *Nimbapatradi dhoopana* used for its antimicrobial action. [8] *Vimlapana* reduces

resistance to circulation, facilitating delivery of nutrients and oxygen and helps in heal early. [9] *Panchatikta ghrita guggulu* [10] and herbs used in this preparation help in *Vranaropana* and controlling the inflammation. [11] *Mahamanjisthadi kwath* [12], *Arogyavardhini Vati* [13] and *Priyangvadya Taila* [14] help in healing the wound and easy recovery.

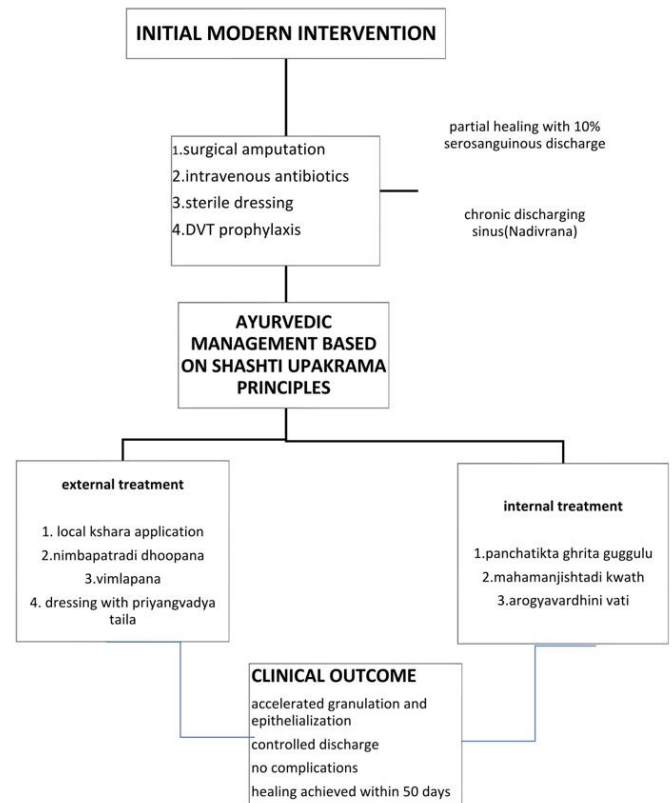


Figure 5: Flowchart of management plan

Strengths: Major strength includes prevention of post-amputation recurrence, highlighting holistic and sustainable integrative approach of evidence based modern surgery with ayurvedic post-operative care in chronic and recurrent condition. Use of wound assessment parameters, laboratory markers and serial photographs supports the clinical outcome and its documentation. It also highlights the role of traditional treatment to reduce post-operative complications.

Limitations: As this is a single case study which restricts generalizability of findings, inconsistent follow ups, heterogeneity in treatment application as per practitioner and patient-specific variability. Lack of MRI restricts detailed assessment also lack of quantitative measures and comparative group.

Key message: Integrative modality enhances the recovery by minimizing the complications and recurrence, making it practical option in recurrent and chronic cases. Further larger studies with long term follow ups are needed in order to ensure its long-term efficacy and generalizability.

4. CONCLUSION:

This present case highlights the role of post-amputation integration of ayurvedic intervention as present case of chronic osteomyelitis was managed initially with standard allopathic treatment protocol which was not proved enough, hence was followed by internal (*Panchatikta ghrita guggula, Mahamanjisthadi Kashaya, Arogyavardhini vati*) and external (*vrana-lekhana, dhoopana*, dressing with medicated oil) ayurvedic interventions which supported healing and wound healed in a 50-day period without any adverse effects and recurrence. Allopathic management with inadequate results or post-surgical chronic cases with low healing rate, integrative management can be followed for better outcomes. Main outcome of the study includes early recovery and prevention of recurrence of wound in chronic-recurrent cases. Key message: Post-surgical integration of ayurvedic intervention is safe and reproducible. When used after surgical intervention especially post-amputation can

improve postoperative outcomes and can prevent recurrence. Though, in future, it should be implemented for other chronic conditions also with larger sample size.

Abbreviations:

DVT-Deep Venous Thrombosis

ESR-Erythrocyte Sedimentation Rate

NS-Normal Saline

VAS-Visual Analog Scale

WBC -White Blood Cells

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient perspective - I neglected my injury for many days by taking medicines from local practitioner in a hope that it will heal. But it led to this complication. Now my wound is finally healed. I want to thank all the doctors for their treatment and timely advice.

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Declaration of Generative AI

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