



Case Report

Krimighna (anthelmintic) role of *Neem Oil* (medicated oil of *Azadirachta indica* Linn.) and adjuvant Ayurvedic therapies in the management of anal myiasis: A case report



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ABSTRACT

Myiasis is an uncommon pathology of parasitic infestation in live mammals by fly larvae (maggots). The fly grows and gets nourished by invading host tissue. Epidemiology of Myiasis has been recorded in tropical regions of world. No any documentation has been found on Ayurvedic intervention for anal myiasis management. The study is about a 49-year male having anal myiasis along and interno-external piles together. The case was managed by local application of *Neem* oil (Medicated oil of *Azadirachta indica* Linn.) soaked gauze piece once a day on daily bases in the invaded tissues of myiasis along with *Ksharasutra* ligation in the base of pile mass once during the treatment protocol. Internal medicines like *Pippali* (*Piper longum* Linn.), *Erand Bhrisht Haritaki* (*Terminalia chebula* Retz. roasted with castor oil) and *Vidanga* (*Embelica ribes* Burm. f.) were prescribed along with the local management during the course of the treatment. The case was completely cured and was relieved in 29 days. *Neem* oil revealed *Krimighna* (anthelmintic) effect which helped in tissue debridement and enhanced wound healing. *Neem* oil remains less irritant on local application and also gives soothing effect and kills the maggots as well.

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1. Introduction

A parasitic infestation of the body of a live mammal by fly larvae (maggots) that grow inside the host while feeding on tissue is described as Myiasis. Hand full of clinical researches are documented on case of anal myiasis along with anal pathologies most in pre-existing carcinomatous ulcers, condyloma acuminata, fistula-in-ano, and gangrenous haemorrhoids [1,2]. *Neem* (*Azadirachta indica* Linn.) is an Indian origin herbal medicine and classically indicated for its anthelmintic, disinfection, anthelmintic, anti-itching and wound healing activity [3,4]. *Ksharasutra* is a medicated seton device, which is practiced for the management of Haemorrhoids and known for its chemical cutting effect and pressure necrosis especially for the management of haemorrhoids [5]. Herbal medicines like *Pippali*, and *Haritaki* are single drugs that provide *Deepana-Pachana* effect and their anti-oxidant role helps in tissue healing [6].

This case is about *Bahya Krimi* (external maggotification) in Ayurveda, for which 'Three stages management' has been recommended by Charaka. They are *Apakarshana* (to remove the *Krimi*) *Prakriti Vighata* (counteracting the cause of disease) and *Nidana Parivarjana* (necessary prerequisite for cure and prevention of recurrence of disease) [7].

2. Case details

2.1. Patient information

A 49-year male labour was reported with 10 days history of severe peri anal pain along with irregular bowel habit. He developed on and off bleeding per rectum in bouts during defecation for 5 days. He revealed 3 days history of peri anal itching and crawling sensation. Poor hygiene, improper cleaning of private parts after defecation by using stones and grass and open defecation were revealed by the patient on the first consultation. On inspection active venous bleeding and live maggots were detected in open wound of 1 o'clock position on anal verge. 7 to 11 o'clock matted interno-external pile mass was also observed along with that. With

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Fig. 1. Pre- Operative picture of the case with 7 to 11 o'clock position matted interno-external pile mass and visible maggot in the catch.

this, patient was diagnosed as a case of anal myiasis with interno external piles [Fig. 1].

Haematology profile of the case was reported with Hb: 12.3 g%, TLC: 8600/cmm, DLC (polymorph neutrophils: 72, lymphocytes: 22, eosinophils: 03 and monocytes: 03), ESR: 50 mm/h; RBS:102 mg/dL, BT:1 min. 56 s and CT: 4 min 2 s. Serological investigations for HIV and HBsAg were found negative. Urine routine and microscopic examination was found normal (19/07/2017). All the investigations were carried out before and after the treatment [Table 1].

2.2. Ayurvedic management

After consultation and thorough investigations, the case was managed by applying therapeutic principles of management of maggots in Ayurveda along with conventional management of piles in Ayurveda i.e., *Ksharasutra* ligation [Table 2] [Fig. 2] [7,8].

Maggots were extracted from myiasis wound of the patient before wound dressing on once-a-day bases for initial 5 consecutive days of treatment. *Neem* leaves decoction (decoction of *A. indica* Linn.) sitz bath was given to the patient once a day followed by 5 ml *Neem* oil-soaked gauze pack dressing in myiasis wound for throughout the treatment duration i.e., 29 days. Interno-external pile mass was ligated under local anaesthesia on 8th day of treatment in single sitting with *Apamarga Ksharasutra* prepared at *Ksharasutra* Laboratory of PD Patel Ayurved Hospital (NABH Accredited). Post-operative wound of the sloughed-out pile mass

Table 1
Haematological profile and urine analysis reports (before and after treatment).

Sr. No.	Haematological Profile and Urine Analysis Reports	Before treatment	After treatment
		(19/12/2017)	(10/01/2018)
1.	Hb	12.3 g%	12.5%
2.	TLC	8600/cmm	7600/cmm
3.	DLC		
	Polymorpho nuclear	72	69
	Lymphocytes	22	25
	Eosinophils	03	04
	Monocytes	03	02
	Basophils	—	—
4.	ESR	50 mm/h	15 mm/h
5.	RBS	102 mg/dL	91 mg/dL
6.	BT	1 min 56 s	1 min 50 s
7.	CT	4 min 02 s	4 min 39 s
8.	S- HIV	Negative	- (not done)
9.	S. HBsAg	Negative	- (not done)
10.	Urine Routine and Microscopic Examination	Normal Study	Normal Study

was cleaned with *Neem* leaves decoction once a day followed by *Neem* oil dressing up to complete wound healing i.e., for 15 days from day 15th to day 29th from the initiation of the treatment. *Neem* oil was procured from the *Sundar Ayurved* teaching pharmacy (GMP certified) of the same institute.

Patient was given *Pippali Churna* (fine powder of *Piper longum* Linn.) 3 gm with honey before meal twice a day for initial 7 days of the treatment for *Deepan Pachana* purpose. *Erand Bhrishta Haritaki* (*Terminalia chebula* Ritz. roasted with castor oil) 6 gm was given once a day at bed time with Luke warm water throughout the treatment for complete 29 days. *Vidanga Churna* (Fine powder of *Embelica ribes* Burm. f) 3 gm was given for complete duration of the treatment after meal twice a day. For post-operative 5 days patient was prescribed to take Tab. Cefixime 200 mg + ornidazole 500 mg 1 tablet twelve hourly after meal with simple water and Tab. Diclofenac sodium 50 mg + Paracetamol 500 mg, 1 tablet twelve hourly with simple water.

Patient was prescribed to have food of green gram and rice along with leafy vegetables and gourds throughout the treatment and all the flour products, bakery products and dairy products were avoided. Patient was also restricted to take alcohol. Patient was restricted to sleep in day time and restricted for awaking till late nights throughout the treatment. Patient was advised to use commode for defecation and cleaning the anal area with water to maintain local hygiene.

2.2.1. Follow up

After getting discharged from IPD unit of the hospital, patient was followed up on daily bases in OPD up to complete healing of the wound. After that for 6 months, patient was followed up for a year on monthly once bases on his physical OPD visitation. Till date (for last 3 years) he has not developed any other incident of same clinical condition and he is otherwise healthy in his daily routine and physical works.

3. Result

Maggots were removed completely by 5th day from initiation of the treatment. *Ksharasutra* along with ligated pile mass were sloughed out up to 7th post-operative day. Myiasis wound and post-operative wounds were healed and patient was completely free from pain and discomforts up to 29th day of the treatment [Fig. 3].

Table 2
Therapeutic Timeline of the case.

Sr no	Intervention	Duration	Dates
External Application			
1.	Maggots' extraction every morning up to complete remission of maggots in open anal wound	Day 1 to Day 5	19-23/12/2017
2.	Sitz bath in decoction of Neem leaves (<i>Avagaha Swedana</i>)	Day 1 to Day 7	19-26/12/2017
3.	Neem Oil dressing after sitz bath once in a day	Day 1 to Day 7	19-26/12/2017
4.	<i>Ksharasutra</i> ligation in 7–11 o'clock matted pile mass under local anaesthesia	Day 8	27/12/2017
5.	Sitz bath in decoction of Neem leaves (<i>Avagaha Swedana</i>) in morning just after defecation and before dressing	Day 9 to Day 29	28/12/2017–16/01/2018
6.	<i>Nimba Taila Pichu</i> dressing in open anal wound of Myiasis	Day 9 to Day 29	28/12/2017–16/01/2018
7.	(<i>Ksharasutra</i> along with pile mass was sloughed out on post-operative 7th Day i.e., 15th Day of treatment from Day 1)	Day 15	02/01/2018
8.	Patient was Discharged from Shalyatantra ward, PD Patel Ayurved Hospital Nadiad	Day 20	07/01/2018
Internal Medications			
9.	Cap. Cefixime 200 mg + ornidazole 500 mg 1 Capsule twelve hourly after meal with simple water (for 5 days following operative procedure of <i>Ksharasutra</i> ligation)	Day 8 to Day 12	26-31/12/2017
10.	Tab. Diclofenac sodium 500 mg + Paracetamol 500 mg, 1 capsule twelve hourly with simple water (for 5 days following operative procedure of <i>Ksharasutra</i> ligation)	Day 8 to Day 12	26-31/12/2017
11.	<i>Pippali Churna</i> (Fine powder of <i>Piper longum</i> Linn.) 3g. With honey twice a day before meal	Day 1 to Day 7	26-30/12/2017
12.	<i>Eranda Bhrishtha Haritaki</i> 6 gm orally at bed time with Luke warm water	Day 1 to Day 29	19/12/2017 to 16/01/2018
13.	<i>Vidanga Churna</i> (Fine powder of <i>Embelica ribes</i> Burm. f.) 3 gms. orally after meal with Luke warm water twice a day	Day 1 to Day 29	19/12/2017 to 16/01/2018



Fig. 2. Post- Operative picture of the case with complete sloughed out all the pile mass and complete removal of the maggots, with healthy granulation in the wound base.



Fig. 3. Complete healing.

4. Discussion

Manual extraction of maggots provided **Apakarshana** (removal of the flea-larvae) whereas **Prakriti Vighata** (counteracting the cause of disease) was provided by Neem Oil application, with its anthelmintic effect. Regular application of Neem Oil provided Autolytic tissue debridement through its antimicrobial and antioxidant properties [9]. Anthelmintic properties of *Neem* (*A. indica* Linn.) have also been established against various parasite species [10,11]. Local application of Neem oil is less irritant. Moreover, turpentine oil irritates and provokes the maggots to come out of the wounds, but *Neem* oil helps in reducing the growths of microbes and maggots as well on regular application. **Prakriti Vighata** (counteracting the cause of disease) have been established in this case by this therapy.

Proper sanitization, use of commode lavatories, personal anal hygiene during and after therapy have provided **Nidana Parivarjana** (necessary prerequisite for cure and prevention of recurrence of disease). *Ksharasutra* ligation removed the pile mass from base by chemical cutting and pressure necrosis principle [3]. Moreover therapeutic effect of *Ksharasutra* provided moderate alkaline burn (with pH-9.5) and wound debridement, which augmented the complete demolition of maggots.

Antioxidant property of *Pippali* (*P. longum* Linn.) and *Madhu* (honey) provided tissue rejuvenation and promoted in physiological repair of cellular injury [12]. *Erand Bhrishtha Haritaki* is known for its *Anulomana* action (elimination of flatus, urine and faeces) [13]. That may have synergized the effect of therapy. *Krimighna* (anthelmintic) effect of *Vidanga* (*E. ribes* Burm.f.) has been classically mentioned and clinically proven. It may have augmented the therapy to recover the case throughout the treatment [14].

5. Conclusion

Clinical implementation of classical principles provides a horizon of research and validation of ancient science. A rare case of Anal myiasis with interno-external pile was cured with Ayurvedic principles of *Vranakrimi Chikitsa* of Sushruta along with additional benefit of low-cost management and without any harmful unto-ward effect to the patient.

Patient's perspective

The patients opined that the entire treatment he opted was helpful to him for rising up from his dreadful condition. There was little pain during post operative dressing but it was far less in compare to pain he was having during his clinical condition of Myiasis and interno-external piles.

Informed consent

Informed written consent for the therapeutic procedure and scientific publication was taken prior to starting the management.

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Author contribution

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The entire study clinically and documentation part has been completed by the author herself.

Conflict of interest

Nil.

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References

- [1] Gupta PJ. Human myiasis in anal carcinomatous ulcer—a case report. *Eur Rev Med Pharmacol Sci* 2009 Nov-Dec;13(6):473–4. PMID: 20085129.
- [2] Gupta PJ. Myiasis: a perianal wound infection caused by fly larvae in gangrenous hemorrhoid. *Tech Coloproctol* 2006 Oct;10(3):254–5. PMID: 17086662.
- [3] [Chapter 4], Verse 11. In: Shastri RD, Upadhyaya YN, Pandey GS, Gupta BD, editors. *Charaka samhita of agnivesha, sootra sthana; shadavirechana sha-tashritiya*. Varanasi: Chaukhamba Orientalia; 2013. p. 82.
- [4] Pandey GS. Revised and Enlarged Ed. *Commentary of chunekar KC on bhavaprakasha nighantu of bhavamishra, guduchyadi varga: ver.93-94*. Varanasi: Chaukhamba Bharti Academy; 2010. p. 314.
- [5] Gupta ML, Gupta SK, Bhuyan C. Comparative clinical evaluation of Kshara Sutra ligation and hemorrhoidectomy in Arsha (hemorrhoids). *Ayu* 2011 Apr;32(2):225–9. <https://doi.org/10.4103/0974-8520.92591>. PMID: 22408307; PMCID: PMC3296345. Doi: 10.4103/0974-8520.92591[PubMed].
- [6] Joshi F, Dudhamal TS. Tissue Debridement effect of apamarga kshara taila and adjuvant medications in the management of nonhealing venous ulcer: a case series. *Med J DY Patil Vidyapeeth* 2021;14:549–53. <https://www.mjdrdyv.org/text.asp?2021/14/5/549/319305>.
- [7] [Chapter 7], Verse 14. In: Shashtri RD, Upadhyaya YN, Pandey GS, Gupta BD, editors. *Charaka samhita of agnivesha, vimana sthana; vyadhit rupiya vimana*. Varanasi: Chaukhamba Orientalia; 2013. p. 727–8.
- [8] [Chapter 1], Verse 119-122. In: Shastri AD, editor. *Sushruta samhitha of Sushruta, Chikitsa sthana; dwivraniya Chikitsa*. Delhi: Chaukhamba Sanskrit Samsthana; 2022. p. 15.
- [9] Alzohairy MA. Therapeutic role of *Azadirachta indica* (Neem) and their active constituents in disease prevention and treatment, Evidence Based Complementary and Alternative Medicine. 2016. <https://doi.org/10.1155/2016/7382506>. Article ID 7382506. 11 pages.
- [10] Jeyathilakan N, Murali K, Anandaraj A, Latha BR, Basith AS. Anthelmintic activity of essential oils of *Cymbopogon nardus* and *Azadirachta indica* on *Fasciola gigantica*. *Tamilnadu Journal of Veterinary and Animal Science* 2010;6(5):204–9.
- [11] Jamra N, Das G, Singh P, Haque M. Anthelmintic efficacy of crude neem (*Azadirachta indica*) leaf powder against bovine strongylosis. *J Parasit Dis* 2015 Dec;39(4):786–8. <https://doi.org/10.1007/s12639-014-0423-9>. Epub 2014 Feb 2. PMID: 26688654; PMCID: PMC4675597.
- [12] Kumar S, Malhotra S, Prasad AK, Van der Eycken EV, Bracke ME, Stetler-Stevenson WG, et al. Anti-inflammatory and antioxidant properties of Piper species: a perspective from screening to molecular mechanisms. *Curr Top Med Chem* 2015;15(9):886–93. <https://doi.org/10.2174/1568026615666150220120651>. PMID: 25697561; PMCID: PMC6295909.
- [13] Jirankalgikar YM, Ashok BK, Dwivedi RR. A comparative evaluation of intestinal transit time of two dosage forms of Haritaki [*Terminalia chebula* Retz]. *Ayu* 2012 Jul;33(3):447–9. <https://doi.org/10.4103/0974-8520.108866>. PMID: 23723658; PMCID: PMC3665098.
- [14] Patil U. From the proceedings of Insight Ayurveda 2013, Coimbatore. 24th and 25th May 2013. OA02.14. Krimigna action of vidanga against clinical isolates of multidrug resistant bacteria, importance of correct identification. *Ancient Sci Life* 2013 Jan;32(Suppl. 2):S20. <https://doi.org/10.4103/0257-7941.123834>. PMCID: PMC4147489.