

# Systemic Herbal Drug Delivery of *Vitex Negundo* as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

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## **ABSTRACT**

### **Background:**

Postoperative pain remains one of the most prevalent and clinically significant consequences of surgical intervention. It results from tissue injury–induced activation of peripheral nociceptors and subsequent release of inflammatory mediators such as prostaglandins, cytokines, and bradykinin. Inadequate postoperative pain control may delay wound healing, impair early mobilization, prolong hospital stay, and increase the risk of chronic postsurgical pain development. Multimodal analgesia strategies are increasingly recommended to improve therapeutic outcomes while minimizing adverse effects associated with opioids and non-steroidal anti-inflammatory drugs (NSAIDs). *Vitex negundo*, a medicinal plant traditionally used for inflammatory conditions, has demonstrated analgesic, anti-inflammatory, and antioxidant properties in preclinical studies. However, its clinical role in postoperative pain management remains underexplored.

### **Objective:**

To evaluate the clinical response and analgesic potential of orally administered *Vitex negundo* extract as an adjunct in postoperative pain management following pilonidal sinus excision.

### **Case Description:**

A 38-year-old male patient without systemic comorbidities underwent wide local excision of pilonidal sinus under regional anesthesia. Standard postoperative care, including intravenous antibiotic prophylaxis and gastric protection, was provided. Oral *Nirgundi Ghana Vati* (500 mg twice daily) was administered as adjunct therapy within a multimodal analgesic framework. Pain intensity was assessed using the Visual Analog Scale (VAS), and local inflammatory parameters such as edema, erythema, and tenderness were clinically monitored.

### **Results:**

The patient demonstrated a progressive reduction in postoperative pain intensity, as reflected by declining VAS scores during clinical observation. Associated inflammatory signs, including local swelling and tenderness, showed noticeable improvement. No gastrointestinal intolerance, hypersensitivity reactions, or systemic adverse effects were observed during therapy.

### **Conclusion:**

Adjunct systemic administration of *Vitex negundo* extract may contribute to postoperative pain modulation through inhibition of inflammatory mediators and antioxidant activity. Its favorable short-term safety profile and multimodal pharmacological properties suggest potential integration into postoperative pain management protocols. Further controlled clinical trials with larger sample sizes are necessary to establish definitive efficacy.

**Keywords:** Postoperative pain, *Vitex negundo*, Herbal analgesic, Multimodal analgesia, Drug delivery, Pilonidal sinus surgery

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## **INTRODUCTION**

Postoperative pain remains one of the most frequently encountered and clinically challenging complications

following surgical intervention. Despite advances in anesthetic techniques and analgesic protocols, a significant proportion of surgical patients continue to

## Systemic Herbal Drug Delivery of *Vitex Negundo* as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

experience moderate to severe pain during the immediate postoperative period. Studies suggest that nearly 75–80% of patients report postoperative pain, with approximately 20% experiencing severe discomfort despite standard analgesic therapy<sup>(1,2)</sup>. Inadequate pain control not only affects patient comfort but also contributes to delayed mobilization, prolonged hospitalization, increased healthcare costs, and a higher risk of transition to chronic postsurgical pain<sup>(3)</sup>.

The pathophysiology of postoperative pain is complex and involves both peripheral and central mechanisms. Surgical tissue injury activates peripheral nociceptors, leading to the release of inflammatory mediators including prostaglandins, bradykinin, histamine, serotonin, substance P, and cytokines such as interleukin-1 $\beta$  (IL-1 $\beta$ ), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF- $\alpha$ )<sup>(4,5)</sup>. These mediators lower the activation threshold of nociceptors, resulting in peripheral sensitization. Concurrently, increased excitatory neurotransmission within the dorsal horn of the spinal cord contributes to central sensitization, amplifying pain perception<sup>(6)</sup>. The cyclooxygenase (COX) pathway plays a pivotal role in this process by converting arachidonic acid into prostaglandins, particularly prostaglandin E2 (PGE2), which is strongly associated with postoperative inflammatory pain<sup>(4)</sup>.

Current pharmacological management strategies primarily rely on opioids, non-steroidal anti-inflammatory drugs (NSAIDs), and regional anesthesia techniques. Although opioids provide effective analgesia, their use is limited by adverse effects such as respiratory depression, nausea, vomiting, constipation, sedation, and risk of dependence<sup>(7)</sup>. NSAIDs and selective COX-2 inhibitors are widely used to suppress prostaglandin synthesis; however, prolonged use may result in gastrointestinal irritation, renal impairment, and cardiovascular risks<sup>(8)</sup>. These limitations have encouraged the adoption of multimodal analgesia, where multiple agents with different mechanisms of action are combined to achieve effective pain relief with reduced side effects<sup>(9)</sup>.

In recent years, there has been growing scientific interest in plant-derived pharmacological agents with documented anti-inflammatory and analgesic properties. *Vitex negundo* Linn., belonging to the family Verbenaceae, is traditionally used in inflammatory and painful conditions. Phytochemical analysis has revealed the presence of flavonoids, iridoid glycosides, lignans, and essential oils, which contribute to its pharmacological activity<sup>(10)</sup>.

Experimental studies have demonstrated significant anti-inflammatory and analgesic effects of *Vitex negundo* leaf extract in carrageenan-induced paw edema and acetic acid-induced writhing models<sup>(11,12)</sup>. The plant extract has been shown to inhibit prostaglandin synthesis, modulate cytokine production, and exert antioxidant effects, thereby potentially attenuating inflammatory pain pathways<sup>(12,13)</sup>.

From a drug delivery perspective, systemic oral administration enables gastrointestinal absorption of bioactive constituents, systemic circulation, and modulation of inflammatory mediators at both peripheral tissue and central neural levels. Such a multimodal biochemical action may complement conventional postoperative analgesic regimens without significantly increasing toxicity.

Pilonidal sinus surgery, involving excision of inflamed sinus tracts in the sacrococcygeal region, is associated with postoperative tissue trauma and inflammatory pain. Effective pain management is essential to promote early mobilization and patient comfort.

In this context, the present clinical case study was undertaken to evaluate the potential role of orally administered *Vitex negundo* extract as an adjunct in postoperative pain management following pilonidal sinus excision.

### **CASE PRESENTATION AND METHODOLOGY**

#### **Patient Information**

A 38-year-old male presented to the surgical outpatient department with complaints of persistent pain and intermittent purulent discharge from the sacrococcygeal region. The symptoms had been gradually progressive and were associated with discomfort during prolonged sitting, which significantly interfered with daily occupational activities. The patient was employed in a sedentary profession requiring extended sitting hours.

The patient had no history of:

- Diabetes mellitus
- Hypertension
- Autoimmune disorders
- Chronic analgesic use
- Prior surgical interventions

There was no history of smoking, alcohol abuse, or known drug allergies.

#### **Clinical Examination**

On local examination:

- A single midline sinus opening was observed in the natal cleft.
- Surrounding erythema was present.

## Systemic Herbal Drug Delivery of *Vitex Negundo* as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

- Localized tenderness was elicited on palpation.
- Seropurulent discharge was noted.

There was no evidence of systemic infection such as fever or lymphadenopathy.

### Diagnosis

Based on clinical findings, a diagnosis of primary pilonidal sinus was established.

### Surgical Procedure

Wide local excision of the sinus tract was performed under spinal anesthesia. The sinus tract and associated inflammatory tissue were completely excised. Hemostasis was achieved, and the surgical site was dressed according to standard sterile protocol.

Intraoperative complications were not encountered.

### Postoperative Drug Administration

Postoperative management focused on infection control, gastric protection, and multimodal pain management.

The patient received:

Medication	Dose	Route	Purpose
Ceftriaxone	1 g twice daily		
Pantoprazole	40 mg twice daily		
Ondansetron	4 mg as needed	Intravenous	Antiemetic support
<i>Nirgundi Ghana Vati</i>	500 mg twice daily	Oral	Analgesic & Anti-inflammatory

**TABLE 1 : DRUG ADMINISTRATION**

The herbal formulation was administered after ensuring the patient was hemodynamically stable and able to tolerate oral intake.

### Reason for Alternate Herbal Analgesic

The decision to introduce *Vitex negundo* extract as adjunct therapy was based on:

1. Documented anti-inflammatory activity
2. Demonstrated peripheral and central analgesic effects
3. Favorable safety profile in short-term administration
4. Potential multimodal modulation of inflammatory mediators

The intention was not to replace standard analgesic care, but to evaluate whether systemic phytochemical administration could support postoperative pain modulation.

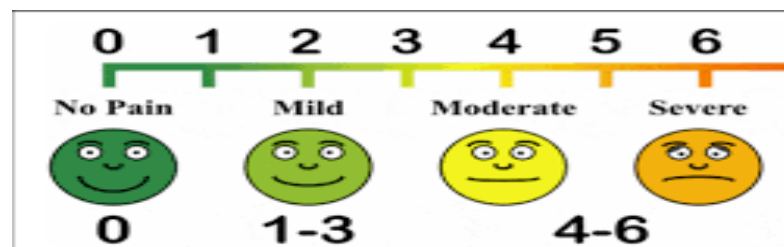
### Pain Assessment Methodology

Pain intensity was evaluated using the **Visual Analog Scale (VAS)**, a validated and widely accepted tool for postoperative pain assessment.

The VAS consists of a 10-point scale where:

- 0 represents no pain
- 10 represents worst imaginable pain

Pain scoring was documented once in 24 hours for 3 days.



**FIGURE 1: VAS SCORE SCALE**

### Assessment of Postoperative Edema

Local postoperative inflammation was assessed by evaluating **periwound edema** as the primary objective inflammatory parameter.

Edema was graded using a semi-quantitative clinical grading scale:

Grade	Purpose	Edema Description
Grade 0		No visible swelling
Grade 1		Mild swelling confined to skin
Grade 2	Antiemetic support	Moderate swelling extending to surrounding tissue
Grade 3	Analgesic & Anti-inflammatory	Severe tense swelling with redness

**TABLE 2 : EDEMA GRADING SCALE**

Clinical grading was performed during postoperative evaluation by visual inspection and gentle palpation under standardized lighting conditions.

This focused approach was adopted to ensure clarity and reproducibility in assessment, as edema represents a direct clinical manifestation of the inflammatory response following surgical tissue injury

Clinical grading was performed during postoperative evaluation once in 24 hours for 3 days.

### MECHANISM OF ANALGESIC ACTION

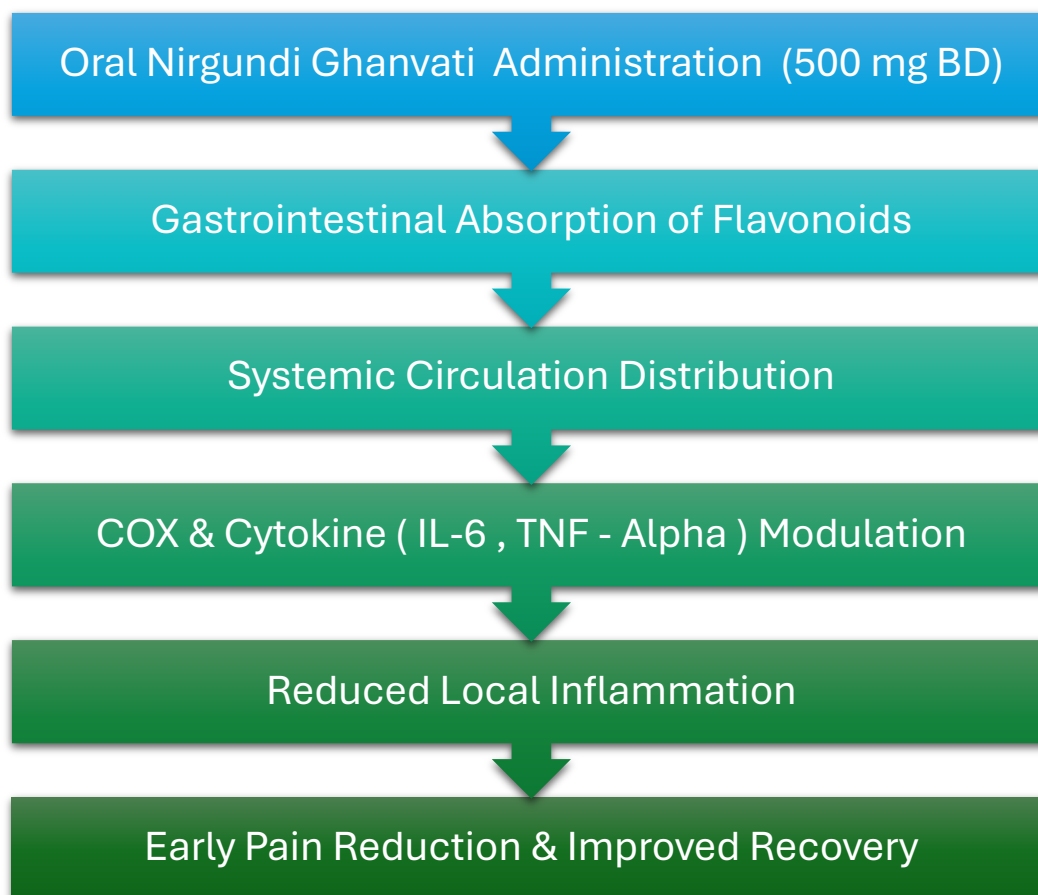
The analgesic action of *Vitex negundo* may involve multiple mechanisms:

1. Inhibition of COX-2 enzyme activity, reducing prostaglandin synthesis<sup>(8)</sup>
2. Suppression of pro-inflammatory cytokines such as TNF- $\alpha$  and IL-6<sup>(9)</sup>
3. Antioxidant scavenging of reactive oxygen species, limiting oxidative tissue injury<sup>(10)</sup>
4. Peripheral analgesic activity demonstrated in writhing models<sup>(7)</sup>

## Systemic Herbal Drug Delivery of Vitex Negundo as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

5. Central analgesic modulation shown in tail immersion studies <sup>(7)</sup>  
The multimodal biochemical influence suggests potential synergy with conventional postoperative regimens.

Subsequent assessments demonstrated a progressive decline in VAS scores during the monitoring period. The reduction in pain intensity was clinically appreciable and corresponded with improvement in patient comfort and mobility.



**FIGURE 2 : FLOWCHART OF PROPOSED DRUG DELIVERY MECHANISM**

The graphical representation of VAS score reduction is presented below:

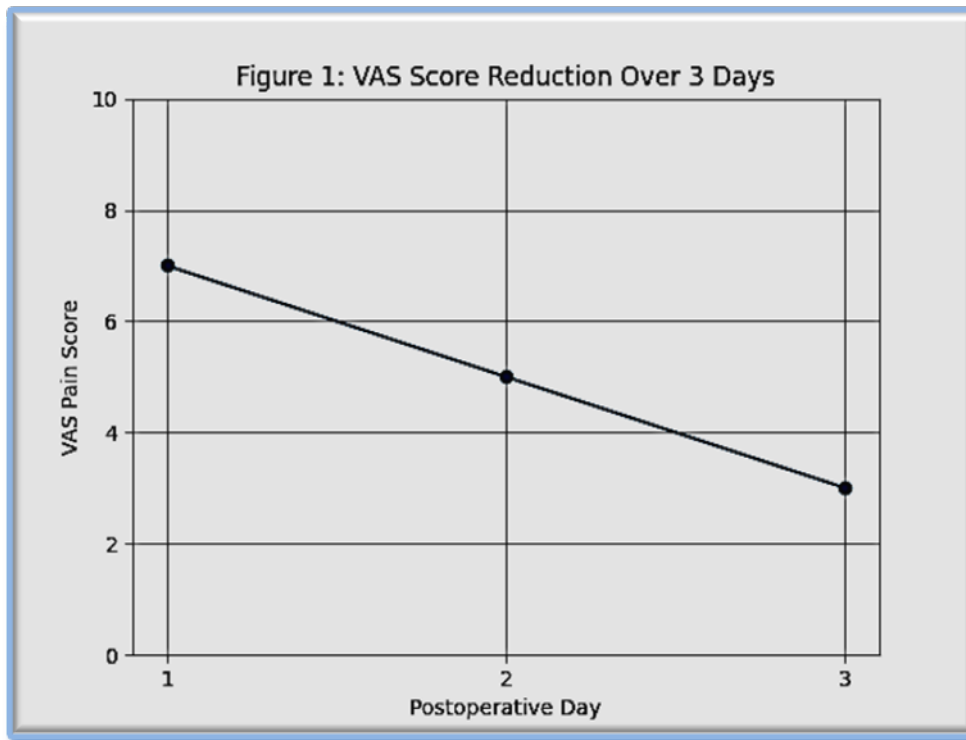
### **RESULTS**

Postoperative pain intensity and local inflammatory parameter were evaluated systematically during clinical observation. The assessment focused primarily on analgesic response following administration of oral *Vitex negundo* extract within the multimodal postoperative regimen.

### **Pain Assessment Outcomes**

Pain intensity was measured using the Visual Analog Scale (VAS), a validated and widely accepted quantitative tool for postoperative pain evaluation. Initial postoperative assessment revealed moderate to high pain intensity consistent with expected inflammatory response following surgical tissue trauma.

**Systemic Herbal Drug Delivery of Vitex Negundo as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report**



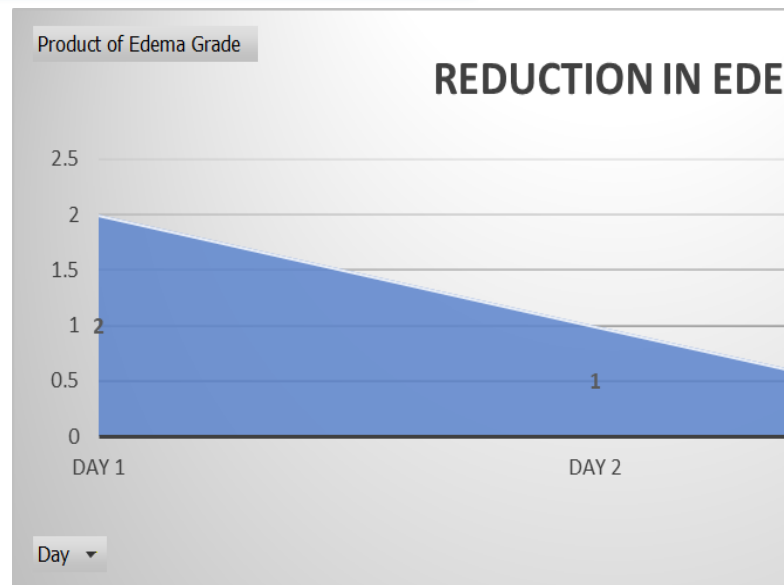
**FIGURE 3: VAS SCORE REDUCTION GRAPH**

The downward trend suggests effective modulation of inflammatory pain pathways during the early postoperative phase. The patient reported improved ability to sit with reduced discomfort and did not require escalation of analgesic support.

**Edema Evaluation**

Initial postoperative examination revealed moderate periwound edema consistent with expected inflammatory response following surgical excision. Subsequent clinical assessment demonstrated a gradual reduction in edema grade during monitoring. The reduction in swelling corresponded with improvement in pain intensity measured by the Visual Analog Scale (VAS).

**Figure 3: Edema Reduction Chart.**



**FIGURE 4: EDEMA REDUCTION CHART**

The decline in edema severity suggests attenuation of inflammatory tissue response, potentially reflecting inhibition of prostaglandin-mediated vascular permeability.

**Safety and Tolerability**

Throughout the postoperative observation period, the patient was monitored for potential adverse reactions

## Systemic Herbal Drug Delivery of *Vitex Negundo* as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

associated with oral *Vitex negundo* administration. Particular attention was given to:

- Gastrointestinal intolerance
- Nausea or vomiting
- Hypersensitivity reactions
- Signs of hepatic or renal dysfunction

No adverse events were reported. The patient tolerated the herbal formulation well, and no discontinuation was required.

### Clinical Interpretation

The observed decline in pain intensity, along with improvement in local inflammatory parameter, suggests a potential supportive role of systemic *Vitex negundo* administration in postoperative pain modulation. The absence of adverse effects further indicates favorable short-term tolerability.

However, as this observation is based on a single clinical case without comparative control, findings should be interpreted cautiously.

### DISCUSSION

Postoperative pain following pilonidal sinus excision is primarily inflammatory in origin and results from a cascade of peripheral tissue injury responses. Surgical incision and tissue manipulation activate phospholipase A<sub>2</sub>, leading to the liberation of arachidonic acid from membrane phospholipids and subsequent synthesis of prostaglandins via the cyclooxygenase pathway<sup>(4)</sup>. Prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) is particularly significant in lowering nociceptor activation thresholds and enhancing peripheral sensitization<sup>(4,8)</sup>. In the present case, the early postoperative pain experienced by the patient is consistent with these well-established inflammatory mechanisms.

Beyond prostaglandins, inflammatory cytokines such as IL-1 $\beta$ , IL-6, and TNF- $\alpha$  contribute to vascular permeability, plasma extravasation, and recruitment of inflammatory cells at the surgical site<sup>(5)</sup>. Clinically, this inflammatory cascade manifests as localized edema, which not only reflects tissue inflammation but may also mechanically stimulate nociceptors, thereby intensifying pain perception. The reduction in edema observed during follow-up in the present case may therefore indicate attenuation of inflammatory mediator activity.

Sustained nociceptive input from the surgical wound can further induce central sensitization within the dorsal horn of the spinal cord<sup>(6,7)</sup>. Neuronal plasticity mechanisms amplify pain transmission, increasing responsiveness to both noxious and non-noxious

stimuli<sup>(16)</sup>. If inadequately managed, this process may contribute to persistent postoperative pain syndromes<sup>(3)</sup>. Therefore, early and effective modulation of peripheral inflammatory pathways is crucial not only for immediate pain relief but also for prevention of long-term sensitization.

Oxidative stress is increasingly recognized as an important contributor to postoperative inflammatory pain. Reactive oxygen species (ROS) generated at sites of tissue injury activate intracellular signaling pathways, including nuclear factor-kappa B (NF- $\kappa$ B), which regulates transcription of pro-inflammatory cytokines<sup>(15,17)</sup>. This amplification loop sustains inflammation and may prolong postoperative discomfort. Agents possessing antioxidant activity may therefore provide dual benefit by suppressing both oxidative and inflammatory cascades.

In this context, *Vitex negundo* has been shown experimentally to exhibit significant anti-inflammatory and analgesic properties. Animal studies have demonstrated inhibition of carrageenan-induced paw edema and reduction in chemically induced nociception following administration of leaf extracts<sup>(12,14)</sup>. Phytochemical analyses attribute these effects to bioactive constituents such as flavonoids and lignans that interfere with prostaglandin synthesis and inflammatory mediator release<sup>(13)</sup>. Furthermore, antioxidant activity reported in recent studies supports its potential role in modulating ROS-mediated tissue injury<sup>(15)</sup>.

The observed progressive decline in Visual Analog Scale (VAS) pain scores in the present case, accompanied by reduction in postoperative edema grading, may reflect suppression of inflammatory mediator activity at the surgical site. While conventional NSAIDs act primarily through COX inhibition<sup>(8)</sup>, plant-derived compounds may exert broader multimodal biochemical effects including cytokine modulation and antioxidant activity. Such complementary mechanisms align with the principles of multimodal analgesia<sup>(11)</sup>, which emphasize targeting multiple pathways simultaneously to enhance analgesic efficacy while minimizing adverse effects.

Opioid-based analgesia, although effective, carries risks including respiratory depression, gastrointestinal disturbances, and dependence<sup>(10)</sup>. Therefore, adjunctive therapies that allow reduction in opioid requirement are of considerable clinical interest. The integration of phytopharmacological agents with established safety profiles may represent a rational supportive strategy in selected cases.

## Systemic Herbal Drug Delivery of *Vitex Negundo* as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

It must be acknowledged that this report represents a single clinical observation and cannot establish causality or generalizable efficacy. Variability in pain perception, wound characteristics, and individual inflammatory responses may influence outcomes. Nevertheless, the biological plausibility supported by experimental pharmacological evidence<sup>(12–15)</sup> provides a mechanistic basis for the clinical findings observed in this patient.

Future investigations involving randomized controlled trials, standardized dosing regimens, larger patient populations, and objective inflammatory biomarkers are warranted to further evaluate the therapeutic potential of *Vitex negundo* as an adjunct in postoperative pain management following minor surgical procedures.

### CONCLUSION

Postoperative pain following pilonidal sinus excision is predominantly inflammatory in nature and is closely associated with prostaglandin-mediated nociceptor sensitization and cytokine-driven vascular changes. Effective modulation of the inflammatory cascade remains a central objective in optimizing postoperative recovery and patient comfort.

In the present clinical observation, adjunct systemic administration of *Vitex negundo* extract was associated with a progressive reduction in pain intensity as measured by the Visual Analog Scale, along with a corresponding decline in postoperative edema severity. The parallel improvement in subjective and objective clinical parameters suggests a potential anti-inflammatory contribution to postoperative pain modulation.

The pharmacological properties of *Vitex negundo*, including inhibition of cyclooxygenase-mediated prostaglandin synthesis, cytokine modulation, and antioxidant activity, provide a plausible mechanistic basis for its supportive role within a multimodal analgesic framework. Importantly, the herbal formulation was well tolerated, and no adverse events were observed during the clinical course.

Although findings from a single case cannot establish definitive efficacy, this observation highlights the potential of plant-derived systemic drug delivery as an adjunct approach in postoperative pain management. Further randomized controlled trials incorporating larger patient populations, standardized dosing regimens, and objective inflammatory biomarkers are necessary to validate these preliminary findings and define its therapeutic role more clearly.

### REFERENCES

1. Garimella V, Cellini C. Postoperative pain control. *Clinical Colon and Rectal Surgery*. 2013;26(3):191–196. DOI: 10.1055/s-0033-1351138
2. Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: Results from a national survey. *Anesthesia & Analgesia*. 2003;97(2):534–540. DOI: 10.1213/01.ANE.0000068822.10113.9E
3. Cata JP, Bugada D, Marchesini M, et al. Persistent postoperative pain: Pathophysiology and risk factors. *Best Practice & Research Clinical Anaesthesiology*. 2019;33(3):309–320. DOI: 10.1016/j.bpa.2019.07.001
4. Basbaum AI, Bautista DM, Scherrer G, Julius D. Cellular and molecular mechanisms of pain. *Cell*. 2009;139(2):267–284. DOI: 10.1016/j.cell.2009.09.028
5. Watkins LR, Maier SF. Beyond neurons: Evidence that immune and glial cells contribute to pathological pain states. *Physiological Reviews*. 2002;82(4):981–1011. DOI: 10.1152/physrev.00011.2002
6. Woolf CJ. Central sensitization: Implications for the diagnosis and treatment of pain. *Pain*. 2011;152(Suppl 3):S2–S15. DOI: 10.1016/j.pain.2010.09.030

## Systemic Herbal Drug Delivery of Vitex Negundo as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

7. Latremoliere A, Woolf CJ. Central sensitization: A generator of pain hypersensitivity. *Journal of Pain*. 2009;10(9):895–926. DOI: 10.1016/j.jpain.2009.06.012
8. Gupta A, Bah M. NSAIDs in the treatment of postoperative pain. *Journal of Advanced Pharmaceutical Technology & Research*. 2016;7(2):52–58. DOI: 10.4103/2231-4040.177385
9. Ong CK, Lirk P, Tan CH, Seymour RA. An evidence-based update on nonsteroidal anti-inflammatory drugs. *Clinical Medicine & Research*. 2007;5(1):19–34. DOI: 10.3121/cm.2007.698
10. Hutchison RW. Challenges in acute postoperative pain management. *American Journal of Health-System Pharmacy*. 2007;64(Suppl 4):S2–S5. DOI: 10.2146/ajhp070075
11. Kehlet H. Multimodal approach to control postoperative pathophysiology and rehabilitation. *British Journal of Anaesthesia*. 1997;78(5):606–617. DOI: 10.1093/bja/78.5.606
12. Dharmasiri MG, Jayakody JRAC, Galhena G, Liyanage SSP, Ratnasooriya WD. Anti-inflammatory and analgesic activities of mature fresh leaves of Vitex negundo. *Journal of Ethnopharmacology*. 2003;87(2–3):199–206. DOI: 10.1016/S0378-8741(03)00159-4
13. Zheng CJ, Huang BK, Han T, Zhang QY, Zhang H, Qin LP. Anti-inflammatory lignans from Vitex negundo. *Fitoterapia*. 2014;94:220–226. DOI: 10.1016/j.fitote.2014.02.012
14. Tandon VR, Gupta RK. Evaluation of analgesic activity of Vitex negundo. *Indian Journal of Physiology and Pharmacology*. 2006;50(4):369–375.
15. Vo GV, Ngo DH, Nguyen HM, et al. Antioxidant and anti-inflammatory activities of Vitex negundo extract. *Saudi Pharmaceutical Journal*. 2022;30(5):512–520. DOI: 10.1016/j.jsps.2022.02.006
16. Woolf CJ, Salter MW. Neuronal plasticity: Increasing the gain in pain. *Science*. 2000;288(5472):1765–1769. DOI: 10.1126/science.288.5472.1765
17. Lawrence T. The nuclear factor NF- $\kappa$ B pathway in inflammation. *Cold Spring Harbor Perspectives in Biology*. 2009;1(6):a001651. DOI: 10.1101/cshperspect.a001651

### TABLES

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Ceftriaxone	1 g twice daily	Intravenous	Antibiotic coverage
Pantoprazole	40 mg twice daily	Intravenous	Gastric protection
Ondansetron	4 mg as needed	Intravenous	Antiemetic support
<i>Nirgundi Ghana Vati</i>	500 mg twice daily	Oral	Analgesic & Anti-inflammatory

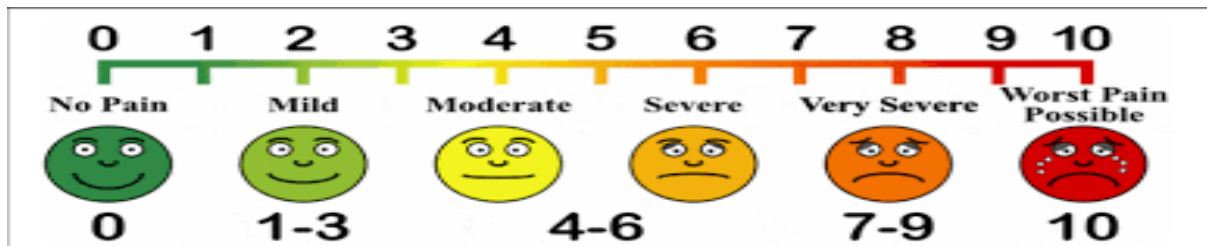
**TABLE 1 : DRUG ADMINISTRATION**

Grade 0	No visible swelling
Grade 1	Mild swelling confined to surgical margins
Grade 2	Moderate swelling extending beyond margins
Grade 3	Severe tense swelling with marked tissue elevation

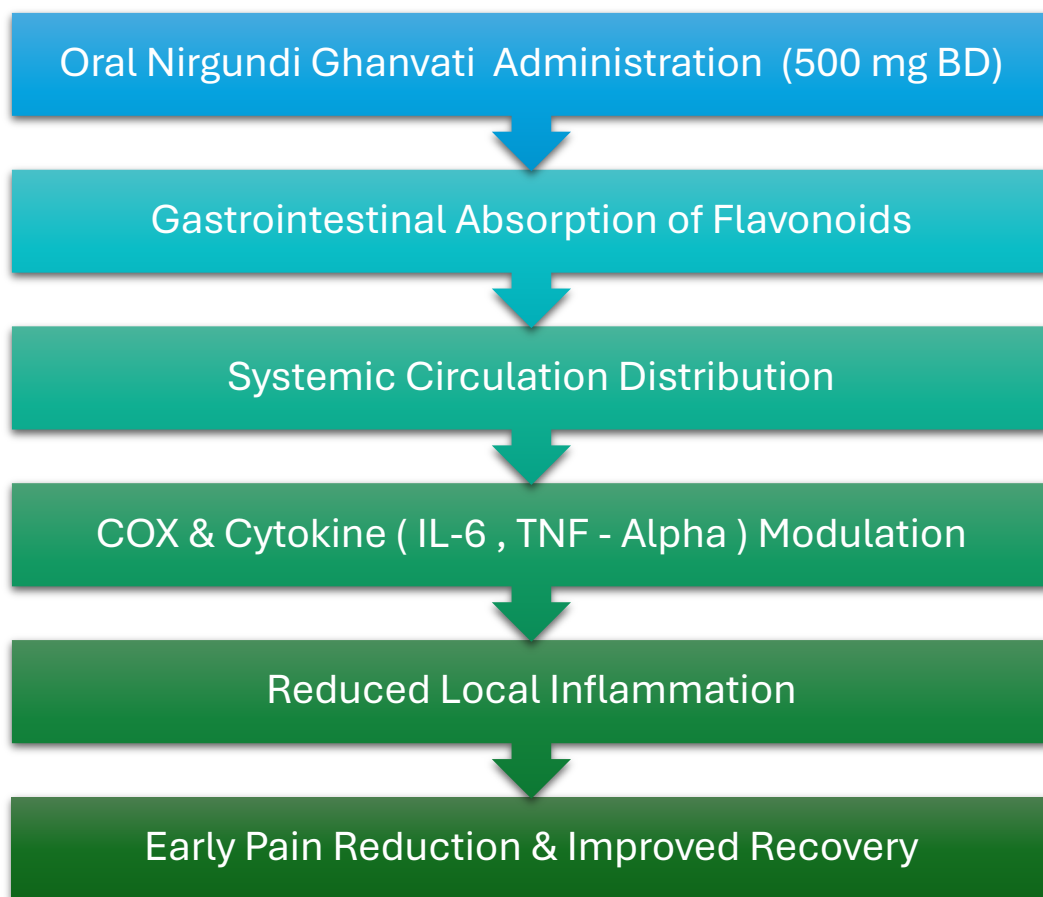
**TABLE 2 : EDEMA GRADING SCALE**

Systemic Herbal Drug Delivery of Vitex Negundo as an Alternate in Postoperative Pain Management Following Pilonidal Sinus Excision: A Clinical Case Report

**FIGURES**

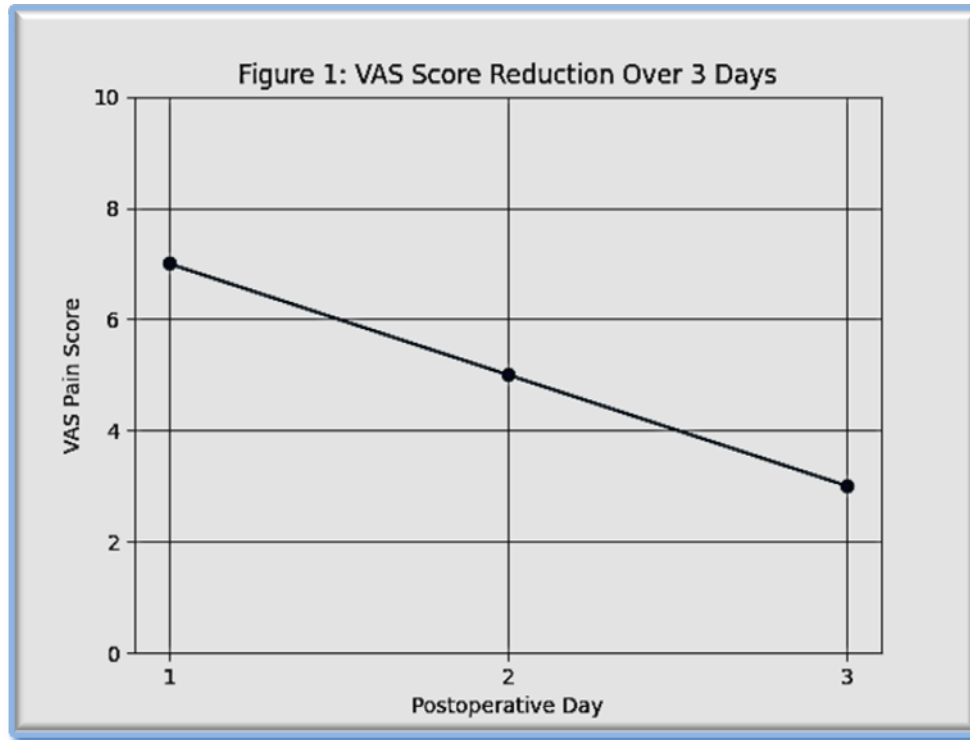


**FIGURE 1: VAS SCORE SCALE**

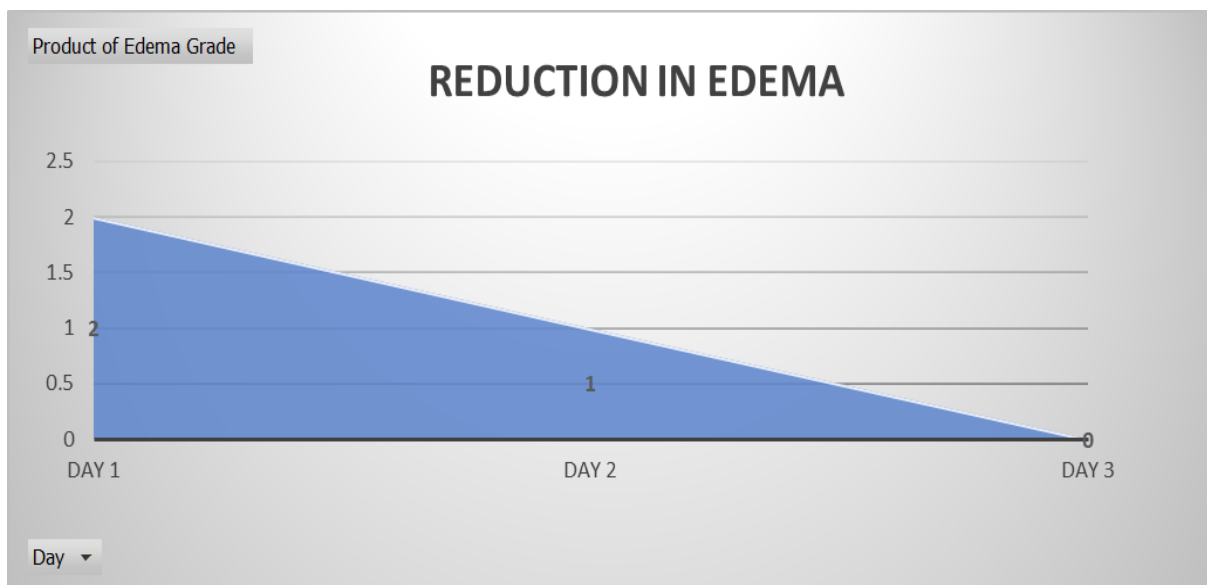


**FIGURE 2 : FLOWCHART OF PROPOSED DRUG DELIVERY MECHANISM**

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**FIGURE 3: VAS SCORE REDUCTION GRAPH**



**FIGURE 4: EDEMA REDUCTION CHART**