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"CLINICAL EFFICACY OF A COMPREHENSIVE MULTIMODAL AYURVEDIC REGIMEN IN THE MANAGEMENT OF LATERAL EPICONDYLITIS (TENNIS ELBOW): A PROSPECTIVE OPEN-LABEL CLINICAL OBSERVATIONAL STUDY"

Dr. Mangesh P. Deshpande[1*], Dr. Chintan Sangani[2]

1. Dean & Mentor, Fellowship in Ayurvedic Clinical Rheumatology, Orthoved Hospital
2. Mentor, Fellowship in Ayurvedic Clinical Dermatology, Orthoved Hospital

Address for correspondence:
Dr. Mangesh P. Deshpande, Dean & Mentor, Fellowship in Ayurvedic Clinical Rheumatology, Orthoved Hospital
Email Id: dr.mangeshdeshpande@gmail.com
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ABSTRACT

Background

Lateral epicondylitis (tennis elbow) is a prevalent musculoskeletal disorder characterized by pain and functional impairment at the lateral epicondyle of the humerus, predominantly resulting from repetitive overuse of wrist extensor musculature. Contemporary evidence classifies it as a degenerative tendinopathy involving angiofibroblastic hyperplasia rather than a purely inflammatory condition [1,2]. Conventional management includes NSAIDs, physiotherapy, corticosteroid injections, and platelet-rich plasma therapy; however, recurrence, incomplete relief, and adverse effects remain significant concerns [3,4]. In Ayurveda, this condition correlates with *Snayugata Vata* or localized *Koorpara Sandhigata Vata*, where aggravated *Vata Dosha* affects *Snayu* (tendons), producing pain, stiffness, and restricted movement [5,6].

Objective

To evaluate the clinical effectiveness and safety of a multimodal Ayurvedic therapeutic protocol in patients diagnosed with lateral epicondylitis.

Methods

A prospective, open-label, single-center observational study was conducted at Orthoved Hospital on 120 patients (aged 30–60 years) with clinically confirmed lateral epicondylitis. The six-week intervention comprised Tab Tendon, Tab Panchavaktra, Tab Sallaki (each 400 mg TDS), Orthofite Oil (local application, twice daily), and an elbow guard during working hours.

Results

Of 120 enrolled patients, 110 completed the study. Complete relief was achieved in 85 patients (77.3% of completers), moderate improvement in 18 (16.4%), no relief in 5 (4.5%), and worsening in 2 (1.8%). The overall response rate was 93.6% among completers and 85.8% of total enrolled. Adverse events were minimal, with mild acidity in approximately 5% of patients.

Conclusion

The multimodal Ayurvedic regimen demonstrated substantial clinical effectiveness in the conservative management of lateral epicondylitis, offering a safe integrative therapeutic option warranting further controlled investigation.

Keywords: Ayurveda, Conservative management, Lateral epicondylitis, *Sallaki*, *Snayugata Vata*, Tendinopathy, Tennis elbow

INTRODUCTION

Lateral epicondylitis, commonly known as tennis elbow, is one of the most frequently encountered causes of elbow pain in orthopaedic and musculoskeletal clinical practice. Despite its colloquial association with racquet sports, the condition predominantly affects individuals engaged in repetitive occupational activities involving wrist extension, forearm supination, gripping, and lifting [1]. The prevalence in the general population is estimated between 1% and 3%, with peak incidence occurring between 35 and 54 years of age [3]. Occupational categories at particular risk include information technology professionals, delivery personnel, medical representatives, and domestic workers.

Pathophysiologically, lateral epicondylitis is now recognized as a degenerative tendinosis rather than a purely inflammatory disorder. Histopathological studies have demonstrated fibroblast proliferation, vascular hyperplasia, disorganized collagen architecture, and microtearing at the extensor carpi radialis brevis (ECRB) origin [2]. This reclassification explains why purely anti-inflammatory strategies often fail to provide sustained recovery.

Clinically, patients typically present with lateral elbow pain, tenderness over the lateral epicondyle, pain aggravated by gripping, pain during resisted wrist extension, and functional impairment in daily activities. Common diagnostic manoeuvres include Cozen's test, Mill's test, and Maudsley's test [3,4].

Conventional therapeutic approaches include NSAIDs, rest, physiotherapy, bracing, corticosteroid injections, platelet-rich plasma (PRP) therapy, and surgical release in resistant cases [4]. Although corticosteroid injections provide rapid symptomatic relief, recurrence rates remain high. NSAIDs frequently cause gastrointestinal adverse effects, while procedural therapies increase treatment cost [3,4].

Ayurvedic Perspective

In Ayurveda, repetitive strain injuries involving tendons are interpreted through the framework of *Vata Dosha* aggravation [5,6]. Repeated overuse (*Ativyayama*), strain (*Ati Cheshta*), and excessive mechanical stress provoke *Vata*, particularly affecting *Snayu* (ligamentous and tendinous structures). This produces the classical picture of *Shoola* (pain), *Stambha* (stiffness), *Sankocha* (restricted movement), and functional weakness [5]. The clinical condition most closely correlates with *Snayugata Vata* or localized *Koorpara Sandhigata Vata* [6].

The therapeutic principles therefore include *Vata Shamana* (pacification of *Vata*), *Shothahara* (anti-inflammatory action), *Snayu Poshana* (tendon nourishment), *Srotoshodhana* (channel purification), and *Nidana Parivarjana* (elimination of causative factors) [5,6]. The present study evaluates a multimodal Ayurvedic intervention developed around these principles.

MATERIALS AND METHODS

Study Design

This was a prospective, open-label, single-centre clinical observational study.

Study Setting

The study was conducted at the outpatient department of Orthoved Hospital.

Study Duration

Each participant underwent a treatment period of six weeks.

Sample Size

A total of 120 clinically diagnosed patients with lateral epicondylitis were enrolled.

Inclusion Criteria

Patients fulfilling all of the following criteria were included: age between 30 and 60 years; clinical diagnosis of lateral epicondylitis with pain localized over the lateral epicondyle; positive Cozen's test and/or Mill's test; pain aggravated by gripping or wrist extension; and occupational repetitive upper limb strain.

Exclusion Criteria

Patients with a history of elbow fracture or dislocation, rheumatoid arthritis, gout, cervical radiculopathy, severe systemic illness, known hypersensitivity to study medications, or suspected tendon rupture were excluded.

Demographic Characteristics

Among the 120 enrolled patients, 35 were male and 85 were female. The major occupational categories included information technology engineers (repetitive computer strain), medical representatives (repetitive carrying and travel strain), housewives (repetitive domestic workload), and delivery personnel (lifting and gripping repetitive activity).

Table 1. Gender Distribution of Enrolled Patients

Gender	Number
Male	35
Female	85
Total	120

Diagnostic Assessment

Diagnosis was established clinically through detailed history taking, assessment of tenderness over the lateral epicondyle, Cozen's test, Mill's test, and evaluation of functional occupational limitation.

Intervention Protocol

The multimodal therapeutic protocol comprised the following components:

Tab Tendon (400 mg, one tablet thrice daily after meals): Composed of *Devdar* (*Cedrus deodara*) 250 mg, *Vidhara* (*Argyreia speciosa*) 100 mg, *Tapyadi Loha* 25 mg, and *Kanta Loha* 15 mg, processed with *Devdar Kwatha* (*Bhavana*) [7,8].

Tab Panchavaktra (400 mg, one tablet thrice daily after meals): Composed of *Sameer Pannaga Rasa* 40 mg, *Yograj Guggulu* 80 mg, *Mahavat Vidhwansa Rasa* 40 mg, and *Shuddha Bhallataka* 10 mg, processed with *Dhattura Patra Swarasa* (*Bhavana*) [7,9].

Tab Sallaki (400 mg, one tablet thrice daily after meals): The primary active botanical constituent is *Boswellia serrata*, a well-documented anti-inflammatory agent [10,11].

Orthofite Oil: Applied locally over the affected lateral epicondyle twice daily with gentle application [7].

Counterforce Elbow Guard: Worn during working hours for mechanical offloading of the affected tendon [4].

Outcome Assessment

Patients were clinically categorized into four outcome groups: (a) complete relief, defined as resolution of pain, negative provocative testing, functional restoration, and no occupational limitation; (b) moderate relief, defined as significant symptomatic improvement with mild residual functional limitation; (c) no relief, defined as no meaningful clinical improvement; and (d) increased complaints, defined as worsening pain or functional limitation.

Safety Assessment

Patients were monitored clinically for gastric irritation, acidity, allergic reactions, and worsening symptoms throughout the treatment period.

Ethical Considerations

Written informed consent was obtained from all participants. The study was conducted in accordance with institutional ethical clinical practice principles.

RESULTS

Patient Flow

A total of 120 patients clinically diagnosed with lateral epicondylitis were enrolled. Of these, 10 patients (8.3%) were lost to follow-up or demonstrated poor compliance with treatment recommendations, particularly irregular use of the elbow guard. The remaining 110 patients completed the full six-week observational treatment period.

Table 2. Study Flow Summary

Study Status	Number	Percentage
Enrolled	120	100%
Completed	110	91.7%

Dropouts	10	8.3%

Clinical Outcomes

Among the 110 patients who completed the study, 85 (77.3%) achieved complete relief, 18 (16.4%) demonstrated moderate relief, 5 (4.5%) showed no relief, and 2 (1.8%) reported increased complaints.

Table 3. Clinical Outcomes Among Study Completers (n=110)

Outcome Category	Number	Percentage
Complete Relief	85	77.3%
Moderate Relief	18	16.4%
No Relief	5	4.5%
Increased Complaints	2	1.8%

Table 4. Clinical Outcomes Among Total Enrolled Patients (n=120)

Outcome Category	Number	Percentage
Complete Relief	85	70.8%
Moderate Relief	18	15.0%
No Relief	5	4.2%
Increased Complaints	2	1.7%
Dropouts	10	8.3%

Therapeutic Success Rate

Clinically meaningful improvement (complete or moderate relief) was observed in 103 patients, yielding a response rate of 93.6% among study completers and 85.8% of the total enrolled population.

Adverse Events

The treatment protocol demonstrated favourable tolerability. Mild acidity was reported by 6 patients (approximately 5%), which was conservatively managed without requiring treatment discontinuation or hospitalization. No serious adverse events, including allergic reactions, severe gastrointestinal distress, neurological adverse effects, or hepatotoxic symptoms, were clinically observed.

DISCUSSION

Lateral epicondylitis remains one of the most frequently encountered chronic upper limb tendinopathies. Accumulating evidence suggests the disorder is predominantly degenerative rather than inflammatory in nature, with histological findings revealing collagen disorganization, fibroblast proliferation, angiofibroblastic hyperplasia, microtearing, and poor tendon healing [1,2]. This pathophysiological understanding explains why isolated anti-inflammatory strategies often fail to provide sustained recovery [3]. The present observational study demonstrated a high overall clinical response rate, with 85 patients achieving complete relief and 18 demonstrating moderate improvement.

Ayurvedic Pathophysiological Correlation

From an Ayurvedic perspective, repetitive mechanical stress (*Ativyayama*) provokes *Vata Dosha* through repeated strain, dryness, overuse, and depletion of local tissue resilience [5,6]. This aggravated *Vata* localizes in *Snayu* structures surrounding the *Koorpara Sandhi*, resulting in a clinical syndrome corresponding to *Snayugata Vata*, characterized by *Shoola* (pain), *Stambha* (stiffness), *Sankocha* (restricted movement), and weakness during movement [5,6]. The present treatment protocol was specifically structured to address these mechanisms.

Mechanistic Rationale of the Therapeutic Protocol

Tab Tendon: This formulation was selected primarily for *Snayu-poshana* (tendon nourishment) and tissue restoration. *Devdar* (*Cedrus deodara*) possesses documented anti-inflammatory and analgesic properties along with *Vata*-pacifying action [7,8]. *Vidhara* (*Argyreia speciosa*) is traditionally used for strengthening, tissue nourishment, and musculoskeletal debility [8]. *Loha* preparations may support tissue metabolism and regeneration [7]. Collectively, this formulation likely contributed toward structural tendon support.

Tab Sallaki: *Sallaki* (*Boswellia serrata*) is one of the best-documented herbal anti-inflammatory agents. Boswellic acids inhibit the 5-lipoxygenase pathway and leukotriene synthesis, providing anti-inflammatory benefits without many of the gastrointestinal risks associated with NSAIDs [10,11]. In chronic tendinopathy, reducing secondary inflammatory irritation likely contributes to pain reduction.

Tab Panchavaktra: This formulation was incorporated for deeper systemic *Vata-Shamana*. *Yograj Guggulu* is widely used in chronic musculoskeletal disorders [9,12]. *Mahavat Vidhwansa Rasa* traditionally addresses severe *Vata* disorders, while *Shuddha Bhallataka*, when properly processed, may enhance bioactivity and anti-inflammatory action [7,9]. The inclusion of *Dhattura Bhavana* suggests enhanced analgesic therapeutic targeting.

Orthofite Oil: Local oil application aligns with the Ayurvedic principle of *Snehana* [5,6]. Benefits likely include reduction of local stiffness, improved microcirculation, pain modulation, and mitigation of localized *Vata* aggravation. Gentle application was clinically preferred, as aggressive massage may worsen microtears.

Elbow Guard: The counterforce elbow guard likely played a crucial therapeutic role. Mechanical unloading reduces repetitive tendon stress, prevents continued microtrauma, and facilitates tendon recovery [4]. This directly aligns with the Ayurvedic principle of *Nidana Parivarjana*—elimination of the causative factor [5,6]. The clinical success observed likely reflects synergy between pharmacological intervention and biomechanical protection.

Comparison with Conventional Management

Conventional treatment options for lateral epicondylitis include NSAIDs, physiotherapy, corticosteroid injections, PRP, extracorporeal shockwave therapy, and surgery [3,4]. NSAIDs provide temporary symptomatic relief but are associated with gastric irritation and recurrence. Corticosteroid injections offer short-term benefit but carry risks of tendon weakening and recurrence [3]. PRP therapy, although potentially useful, is expensive and yields variable responses [4]. Surgical intervention is reserved for refractory cases and carries the burden of invasiveness, recovery time, and cost [4]. The present Ayurvedic protocol offers a conservative outpatient alternative with a favourable efficacy and safety profile.

Adverse Events Analysis

Only mild acidity was reported in approximately 5% of patients, potentially attributable to *Bhallataka*-containing formulations, mineral-herbal combinations, or patient-specific gastric sensitivity [7,9]. Importantly, symptoms were mild, conservatively manageable, and did not require treatment discontinuation. No serious complications were noted, supporting acceptable short-term tolerability.

LIMITATIONS

Despite encouraging findings, several limitations must be acknowledged. The open-label design precludes exclusion of observer and participant bias. The absence of a control group prevents comparison against placebo or standard care. Being a single-centre study, external generalizability is limited. Standardized quantitative outcome scales such as the Patient-Rated Tennis Elbow Evaluation (PRTEE) or the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire were not employed. Diagnosis and response assessment were based exclusively on clinical examination without imaging confirmation. The short follow-up duration did not permit evaluation of long-term recurrence. Finally, the combination therapy design prevents isolation of the individual contribution of each intervention component. These limitations should guide the design of future randomized controlled trials.

CONCLUSION

The present prospective open-label clinical observational study suggests that a multimodal Ayurvedic therapeutic regimen comprising Tab Tendon, Tab Panchavaktra, Tab Sallaki, Orthofite Oil, and counterforce elbow guard immobilization may provide substantial clinical benefit in patients with lateral epicondylitis. The intervention demonstrated high clinical response rates, good tolerability, and functional recovery in most patients. The integrated approach addresses symptom control, tendon support, *Vata* correction, and mechanical unloading. This multimodal protocol may represent a practical conservative therapeutic option for lateral epicondylitis, particularly in outpatient integrative musculoskeletal practice. Larger controlled studies with standardized outcome measures are warranted to confirm these findings.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FUNDING

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AUTHOR CONTRIBUTIONS

Dr. Mangesh P. Deshpande: Conceptualization, academic supervision, manuscript review.

Dr. Chintan Sangani: Clinical execution, patient management, data collection, manuscript preparation.

ETHICAL STATEMENT

Written informed consent was obtained from all participants prior to enrolment. The study was conducted in accordance with institutional ethical clinical practice standards.

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