



Case Study

THERAPEUTIC USE OF MECHANISED *SHRINGAYANTRA* FOR KNEE OSTEOARTHRITIS (*JANUSANDHIGATA VATA*): A RETROSPECTIVE OBSERVATIONAL CASE SERIES OF A PRESSURE-CONTROLLED MECHANICAL VACUUM ADAPTATION OF A CLASSICAL AYURVEDIC BLOODLETTING INSTRUMENT

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ABSTRACT

Knee Osteoarthritis (KOA) is a leading cause of disability globally, affecting 22–39% in Indian adults, and is correlated with *Janu Sandhigata Vata* in Ayurveda. *Shringayantra* a horn-based suction device is used for *Raktamokshana* (therapeutic bloodletting) in *Vataja Shoola* (mechanical pain), but oral aspiration procedure is unhygienic and non-reproducible. This case series reports retrospective clinical outcomes following a modified *Shringayantra* that replaces oral suction with a calibrated vacuum pump in this pilot study.

Methods: A retrospective, observational case series was conducted by chart review of the patients treated at Samadhan Ayurveda Panchakarma Hospital, Nagpur (2025–26). Eighteen consecutive patients diagnosed with knee osteoarthritis (*Janu Sandhigata Vata*) and treated with modified *Shringayantra* were retrieved and analysed. Pre- treatment (BT) and post-treatment (AT) scores for five clinical parameters pain (*Shoola*), swelling (*Shotha*), crepitation, walking pain, and stiffness (*Graha*) were recorded on a 0–4 ordinal scale and compared using Wilcoxon Signed-Rank Test was applied ($p < 0.05$). **Results:** Significant reductions were recorded across all parameters ($p \leq 0.002$). Mean pain score declined from 2.89 ± 0.68 to 0.56 ± 0.51 . Overall: Marked relief ($\geq 75\%$)- 53.33%; Moderate response- 40.00%; Mild improvement- 6.66%; No response- 0%. No adverse events were recorded.

Conclusion: The retrospective chart-review data suggest the modified *Shringayantra* is a safe, effective, and standardisable non-pharmacological intervention for knee OA. Randomised controlled trials are warranted.

INTRODUCTION

Knee osteoarthritis (OA) is the most prevalent musculoskeletal disorder globally, affecting an estimated 303 million people worldwide and 22–39% of adults over 45 in India^[1,2]. Women are disproportionately affected (female-to-male ratio $\approx 3:1$).^[3] Current pharmacological management is NSAIDs, intra-articular corticosteroids, offers

symptomatic relief but carries significant long-term adverse effects, while surgical arthroplasty remains prohibitively expensive in low-resource settings^[4,5].

In Ayurvedic medicine, KOA corresponds to *Janusandhigata Vata*, vitiation of *Vata dosha* with depletion of *Shleshaka Kapha* (synovial analogue) at the *Janusandhi*. Charaka Samhita (Ch.Chi. 28/37)^[6] and Ashtanga Hridayam (A.H.Ni. 15/14)^[7] describe its cardinal features of *Shoola* (pain), *Shotha* (swelling), *Stabdghata* (stiffness), *Shabda* (crepitation), and restricted flexion-extension, mirroring the ACR (American College of Rheumatology) clinical criteria for KOA.

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Raktamokshana (therapeutic bloodletting) via *Shringayantra* is classically indicated for *Vata*-dominated joint disorders^[8]. The traditional procedure, however, relies on oral aspiration, introducing infection-control risks and unquantifiable, non-reproducible suction pressure^[8]. The modified *Shringayantra* invented by the author addresses these limitations by replacing oral suction with a calibrated mechanical vacuum pump (mmHg gauge), enabling standardized, measurable, and hygienic delivery without altering the classical therapeutic principle. The device is routinely used in clinical practice to address diverse pain conditions different sites. This retrospective observational case series was conducted for KOA patients treated with the modified *Shringayantra* to generate preliminary efficacy and safety data to inform future randomized controlled trials.

METHODS

Study Design and Setting

This retrospective, observational case series is based on the clinical records of *Janusandhigata Vata* (KOA) patients of Samadhan Ayurveda Panchakarma Hospital & Research Centre, Nagpur, during 2025–2026, received *Raktamokshana* using modified *Shringayanta*.

Participants

Eighteen consecutive eligible patients' records were selected.

Inclusion: age ≥ 18 years; clinical *Jaanusandhigata Vata* with ≥ 3 of 5 cardinal symptoms; radiological OA Grade 1–3 (Kellgren–Lawrence); complete pre and post treatment symptom grading recorded.

Exclusion: KL Grade 4; inflammatory arthropathies; bleeding diathesis or anticoagulant use; uncontrolled hypertension ($>180/100$ mmHg); skin disease at treatment site; pregnancy.

Intervention- Modified *Shringayantra*

The device (Dr. Gahukar's *Shringa Yantra*, (see fig.3) comprises a mechanical suction pump, calibrated vacuum gauge (0–760mmHg, ± 5 mmHg precision), silicone connecting tubes, interchangeable nozzles (see fig. 1), and ON/OFF suction control. Protocol- (1) local oleation with *Dashamoola Taila*, 5–7 min followed by *Nadi Sweda* (hot fomentation) for 10 min; (2) *Prachchhana* (micro-incision), 1–2mm depth, with 20G needle (see fig.1); (3) The nozzle is applied and vacuum set to 150–250mmHg regulated to tolerance; suction maintained 5–7 min per site (see fig.2). Three to five sessions, minimum 5–7-day intervals. Adjunct to this, oral medication such as *Tab Sandhika*, *Tab Yogararaj Guggulu*, *Tab Sallaki 400* and *Maharasnadi kwatha* were prescribed.



Figure 1. Procedural tray



Figure 2. *Raktamokshana* Procedure using Modified *Shringa Yantra*



Figure 3. Modified *Shringa Yantra*- by Dr. Dhanraj Gahukar

Outcome Measures

Five parameters recorded on a 0–4 ordinal scale (0 = absent; 4 = extreme/constant) at the initial visit (BT) and at final recorded follow-up visit (AT) for pain (*Shoola*), swelling (*Shotha*), crepitation (*Shabda Gati*), walking pain, and stiffness (*Graha*) as per Table 1.

Table 1: Criteria for clinical assessment using standardized 5- point grading scale (0-4)

Parameter	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
Pain (<i>Shoola</i>)	No pain	Mild	Moderate	Severe	Extreme
Swelling (<i>Shotha</i>)	Never	Rarely	Sometimes	Often	Always
Crepitation (<i>Shabda Gati</i>)	Never	Rarely	Sometimes	Often	Always
Walking pain	None	Mild (aggravated by movement)	Moderate	Severe	Extreme
Stiffness (<i>Graha</i>)	Never	Rarely	Sometimes	Often	Always

Composite score = sum of all five parameters (range 0–20). Overall response was derived from the percentage change in combined score- Complete cure (100%), Marked relief ($\geq 75\%$), Moderate response (50–74%), Mild improvement (26–49%), No response ($<25\%$).

Statistical Analysis

Extracted data were tabulated and analysed using SPSS v26.0 (IBM Corp.) Descriptive statistics (mean, SD, median) were calculated for BT and AT scores. As the data were ordinal and case series (n=18), pre-to-post differences were assessed with the Wilcoxon Signed-Rank Test for statistical significance set at $p < 0.05$ (two-tailed).

RESULTS

Cohort Characteristics

Records of 18 patients that met the inclusion criteria were analyzed.

Table 2: Baseline demographics and Clinical comorbidities of the patients

Characteristic	Category / Value	n	%
Sex	Female	15	83.3
	Male	3	16.7
Age group (years)	30–39	1	5.6
	40–49	1	5.6
	50–59	3	16.7
	60–69	10	55.5
	70+	3	16.7
Occupation	Housewife	13	72.2
	Govt. Employee	4	22.2
	Private / Other	1	5.6
Diet	Vegetarian	5	27.8
	Mixed	13	72.2
Marital status	Married	17	94.4
Obesity (BMI ≥ 25 kg/m ²)	Yes	15	83.3
	No	3	16.7
Comorbidities	Hypertension only	8	44.4
	Diabetes only	5	27.8
	Hypertension + DM	3	16.7
	None	2	11.1
Tobacco / Alcohol use	Yes (any)	2	11.1
	No	16	88.9

Abbreviations: DM = Diabetes Mellitus; BMI = Body Mass Index

The cohort was 83.3% female, mean age 61.1 years (range 34–75). The 60–69-year age group constituted 55.5% of participants. Obesity (BMI $\geq 25\text{kg/m}^2$) was present in 83.3%. Comorbidities: hypertension (44.4%), diabetes mellitus (27.8%), both (16.7%), none (11.1%). Mixed diet was reported by 72.2% of dietary history.

Symptom score extracted from Individual Case records

Table 3 presents individual patient scores across all five parameters at BT and AT, composite scores, and percentage improvement.

Table 3: Individual Symptom Scores Before (BT) and After Treatment (AT) with Composite Score and Percentage Improvement (N = 18)

Patient Name	Occupation	Sex	Age	Pain BT/AT	Sw. BT/AT	Crep. BT/AT	WP BT/AT	Stiff BT/AT	Comp. BT	Comp. AT	% Imp.
P01	Housewife	F	74	3→0	2→0	2→0	2→0	2→0	11	0	100%
P02	Govt. Employee	M	74	4→1	3→1	3→0	2→0	1→0	13	2	85%
P03	Housewife	F	60	4→1	2→0	2→0	3→0	2→0	13	1	92%
P04	Teacher	F	64	2→0	2→0	2→0	3→1	2→0	11	1	91%
P05	Farmer	M	64	3→0	1→0	2→0	1→0	0→0	7	0	100%
P06	Teacher	F	67	3→0	2→0	2→0	2→0	2→0	11	0	100%
P07	Housewife	F	68	2→0	3→1	2→1	2→1	2→1	11	4	64%
P08	Housewife	F	67	3→1	2→1	2→0	3→1	2→1	12	4	67%
P09	Doctor	M	35	2→1	2→1	2→0	2→1	1→0	9	3	67%
P10	Housewife	F	34	3→1	2→1	2→0	3→2	2→1	12	5	58%
P11	Housewife	F	48	3→1	2→0	2→1	3→0	2→0	12	2	83%
P12	Housewife	F	57	2→0	3→1	2→0	2→1	2→1	11	3	73%
P13	Housewife	F	75	3→1	2→1	3→1	2→1	2→0	12	4	67%
P14	Housewife	F	60	4→1	2→1	3→1	3→1	2→0	14	4	71%
P15	Housewife	F	63	2→0	2→1	3→2	2→0	2→0	11	3	73%
P16	Housewife	F	58	3→1	3→1	2→1	2→1	2→1	12	5	58%
P17	Housewife	F	56	2→1	4→2	2→1	2→1	1→0	11	5	55%
P18	Housewife	F	63	2→0	2→1	2→0	2→1	2→0	10	2	80%

Note- Sw. = Swelling; Crep. = Crepitation; WP = Walking Pain; Stiff = Stiffness; Comp. = Composite (sum of 5 parameters, max 20); % Imp. = Percentage improvement. Arrow (→) shows BT to AT change.

Descriptive and Inferential Statistics

Statistically significant reductions were observed across all five parameters (Table 4). Pain showed the greatest absolute improvement (mean BT 2.89 → AT 0.56; 80.7% mean improvement). Stiffness showed the highest proportional improvement (86.1%). Crepitation, reflecting articular surface irregularity, showed the more variable but still statistically significant ($p = 0.002$).

Table 4: Pre- and Post-Treatment Descriptive Statistics and Wilcoxon Signed-Rank Test Results (N = 18)

Parameter	Mean BT	Mean AT	SD BT	SD AT	% Imp.	p-value*
Pain (<i>Shoola</i>)	2.78	0.56	0.71	0.50	81.0%	<0.001
Swelling (<i>Shotha</i>)	2.28	0.72	0.65	0.56	70.4%	<0.001
Crepitation	2.22	0.44	0.42	0.60	81.5%	0.002
Walking pain	2.28	0.67	0.56	0.58	71.3%	<0.001
Stiffness (<i>Graha</i>)	1.72	0.28	0.56	0.45	86.1%	<0.001

*Wilcoxon Signed-Rank Test (two-tailed). % Imp. = mean percentage improvement across individual patient scores. $p < 0.05$ denotes statistical significance.

Overall Clinical Response

Table 5 summarizes the distribution of overall clinical response derived from charts data. Notably, no patient recorded No Response, and no serious adverse events occurred.

Table 5. Overall Clinical Response Distribution (N = 18)

Response Category	n	%
Complete Cure (100%)	0	0%
Marked Relief ($\geq 75\%$)	~10	53.33%
Moderate Response (50–74%)	~7	40.00%
Mild Improvement (26–49%)	1	6.66%
No Response <25%	0	0%

Overall response determined by composite score percentage improvement across all five domains.

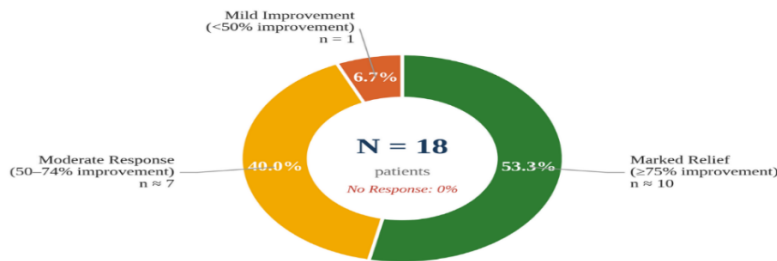


Figure 4. Overall Clinical response distribution using modified *Shringayantra*

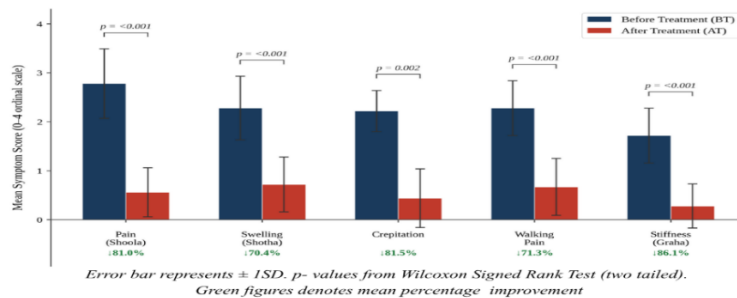


Figure 5. Pre- and Post- Treatment Symptom Scores , (N=18)

DISCUSSION

This retrospective case series, derived from hospital records, documents clinically meaningful improvements across all cardinal features of *Jaanusandhigata Vata* following modified *Shringayantra* therapy, with 93.33% of patients achieving at least moderate response. The 0% no response rate is particularly notable in study where 83.3% were obese and 88.9% carried one or more metabolic comorbidities, both establishes adverse prognostic factors for OA progression.

The therapeutic rationale integrates both classical Ayurvedic and contemporary biomedical mechanisms. Ayurvedically, localized removal of *Dushta Rakta* restores unobstructed *Vata* circulation in the joint space, directly addressing the root of *Shoola* and *Shotha*^[8]. Biomechanically, the negative pressure generated by the device replicates mechanisms documented for cupping therapy: enhanced periarticular microcirculation via shear-stress-mediated nitric oxide upregulation, lymphatic drainage promoting oedema resorption, mechanoreceptor-mediated gate-control analgesia, and modulation of

local pro-inflammatory cytokines (TNF- α , IL-1 β)^[9,10]. These converging mechanisms account for the consistent improvements observed across the diverse symptom domains.

The mechanical modification represents a substantive translational advance. Replacing oral suction with a calibrated pump eliminates three major barriers to evidence-based adoption- (1) infection-control incompatibility, complete operator-patient mucosal barrier is established. (2) non-reproducibility, vacuum pressure is documented in mmHg and reproducible across sessions and practitioners; (3) non-regulation- dose can be individualized and incrementally adjusted in future dose-finding studies. These properties are prerequisites for any procedure seeking integration into mainstream evidence-based practice.

Several limitations must be explicitly acknowledged. The absence of a control group, the small sample size (n=18) limits statistical power and generalizability. No blinding of outcome assessment was feasible in this design. These limitations are

characteristics of retrospective observational case series and are presented to frame this study as hypothesis-generating for future randomized controlled trials (RCTs) with larger samples, sham controls, blinded assessment, validated patient-reported outcome measures (WOMAC, KOOS), and minimum three-month follow-up.

CONCLUSION

The modified *Shringayantra* produces statistically significant and clinically important improvement symptom relief in *Janusandhigata Vata* (knee osteoarthritis), in this study. The mechanical adaptation successfully standardizes a classical Ayurvedic procedure to meet contemporary clinical and infection-control standards. These findings provide a foundation for designing RCTs to confirm efficacy and establish this device as a standard non-pharmacological intervention in integrative knee OA management.

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