



Case Report

Ayurvedic management of recurrent lumbar pain, disability, and leg pain after posterior decompression with transforaminal lumbar interbody fusion in prolapsed intervertebral disc: A case report

Satyajit Pandurang Kulkarni ^{a,*} ID, Pallavi Satyajit Kulkarni ^b ID

^a Panchakarma department, Manjushree Research Institute of Ayurvedic Science, Pethapur—Mahudi Road, Piplaj, 382610, Gandhinagar, Gujarat, India

^b Agadanta Avum Vidhivaidyak Department, Manjushree Research Institute of Ayurvedic Science, Pethapur—Mahudi Road, Piplaj, 382610, Gandhinagar, Gujarat, India



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ABSTRACT

Prolapsed intervertebral disc (PIVD) can lead to debilitating pain and functional limitations. While surgical interventions like Transforaminal Lumbar Interbody Fusion (TLIF) are often employed, recurrence of symptoms is not uncommon. This case report presents the successful Ayurvedic management of a 45-year-old female who developed recurrent lumbar radiculopathy six months after TLIF for PIVD.

The patient presented with severe lumbar pain, disability, and bilateral leg discomfort. Diagnosed with “Prushthagraha” according to Ayurvedic principles, she underwent a 43-day treatment regimen. This included Ayurvedic medications and an initial eight-day course of Sarvanga Abhyanga-Mardana (therapeutic massage) and Swedana (sudation therapy).

Post-treatment, the patient demonstrated significant clinical improvement, evidenced by a substantial reduction in Oswestry Disability Index (ODI) and Visual Analogue Scale (VAS) scores for both lumbar and leg pain. Furthermore, her walking distance increased from 80 m to 1000 m.

This case highlights the potential of Ayurvedic interventions as a complementary approach for managing recurrent lumbar radiculopathy following surgical intervention for PIVD. However, further research with larger sample sizes and controlled study designs is warranted to validate these findings.

1. Introduction

A prolapsed intervertebral disc, characterized by the protrusion of the nucleus pulposus through a weakened annulus fibrosus, often results in nerve root compression. This protrusion arises from the structural composition of the intervertebral disc, which consists of a robust, fibrous outer annulus encasing a softer nucleus pulposus [1].

Degenerative spinal changes are a primary contributor to PIVD, with genetics playing a role in this process [2]. Additional factors, including occupation, trauma, environmental influences, prolonged driving, and smoking, have also been linked to PIVD development [3].

PIVD significantly contributes to low back pain, a globally prevalent condition affecting $23.2 \pm 2.9\%$ of the population [4]. The projected rise in life expectancy suggests a corresponding increase in PIVD incidence.

Management of PIVD can be categorized as conservative or surgical

[5]. Conservative approaches are typically employed initially. While surgical intervention is considered optimal for addressing the underlying pathology [6], the possibility of recurrence remains due to the persistent nature of degenerative changes [7]. Furthermore, surgical interventions carry a substantial financial burden. The lack of effective treatments for post-surgical recurrence often leaves patients facing the prospect of additional procedures. Recurrent lumbar spondylolisthesis, characterized by persistent lumbar pain and disability, significantly impacts quality of life and presents a substantial clinical challenge demanding effective management strategies.

While research on post-operative Ayurvedic treatment for PIVD is limited, several studies suggest the efficacy of Ayurvedic therapies for “Ghridhrasi.” However, these studies lack clarity regarding the application of these treatments in post-operative contexts [8,9].

This report presents a case of lumbar spondylolisthesis with

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* Corresponding author.

E-mail address: satyajitkulkarni2001@gmail.com (S.P. Kulkarni).

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spondylolysis in a patient diagnosed with PIVD. The patient underwent Transforaminal Lumbar Interbody Fusion (TLIF), posterior decompression, and L4-5 posterior fixation on May 31, 2022, performed by an orthopedic consultant.

Six months post-operatively, the patient presented with persistent low back and leg pain. Following Ayurvedic treatment, a significant improvement in all symptoms was observed.

While the etiology of symptom recurrence in this case remains unclear, existing literature reports a recurrence rate of lumbar disc herniation following spinal surgery ranging from 3% to 18% [10].

2. Case report

This report details the Ayurvedic management of a 45-year-old Hindu female (height: 5'3", weight: 124 lbs.) presenting with persistent low back pain (LBP), stiffness following surgical intervention for lumbar spondylolisthesis.

2.1. Patient history

The patient visited on August 28th, 2023, with complaints of moderate LBP (rated 7/10 on a pain scale) and acute leg cramps (rated 6/10) after walking, limiting her ambulation distance to 70–80 m. These symptoms had persisted for six months.

The patient's history of LBP began in 2021, initially presenting as mild to moderate pain that escalated to severe within a month. An orthopedic diagnosis of lumbar disc herniation was confirmed by MRI (Date-24/5/2021), revealing:

- Postcentral protrusion of the L4-L5 and L5-S1 intervertebral discs
- Narrowing of the central canal and bilateral lateral recesses
- Moderate to considerable compression of traversing and exiting nerve roots (Figs. 1–2)

Initial treatment consisted of NSAIDs, muscle relaxants, and nutritional guidance. However, pain recurred within a few months, prompting further consultation. Repeat MRI (Date-23/5/2022) revealed:

- Diffuse posterior disc bulge with central disc protrusion at L5-S1
- Ligamentum flavum thickening
- Facet joint arthropathy
- Compression of the central canal and bilateral lateral recesses
- Moderate compression of exiting nerve roots and mild compression of traversing nerve roots
- Annular tear at L5-S1

Surgical intervention, including L4-5 posterior fixation, posterior decompression, and L4-5 TLIF, was performed on May 31st, 2022 (Fig. 3). Post-operatively, analgesics and muscle relaxants were prescribed.

Six months post-surgery, the patient reported recurrent pain. Due to financial constraints imposed by the initial surgery, the patient sought alternative treatment options.

2.2. Examination and ayurvedic assessment

Physical examination revealed normal vital signs. The patient was using a lumbar support belt. Her gait was impacted by pain and leg cramps. The patient also reported a 20–25-year history of vitiligo, causing significant skin discoloration and impacting her self-esteem. No other significant medical, trauma related, surgical, or psychiatric history was reported. The patient had reached menopause two years prior.

The diagnosis and management of this case presented a unique challenge due to the lack of detailed descriptions of lumbar spondylolisthesis in classical Ayurvedic texts. This difficulty was compounded by



Fig. 1. Lumbar Spine MRI (24/05/2021): moderate nerve root compression.

the patient's post-surgical presentation, as Ayurveda generally favors conservative management strategies for spinal disorders.

The presence of radiating leg pain is a hallmark symptom of both prolapsed intervertebral disc and the Ayurvedic condition known as 'Gridhrasi.' The Charaka Samhita, a foundational text of Ayurveda, describes Gridhrasi as pain originating in the gluteal region and extending to the lower back, upper back, and both anterior and posterior aspects of the thigh [11]. This description closely aligns with the clinical presentation of sciatica, a common manifestation of PIVD, further suggesting a correlation between these two conditions [12].

Therefore, we adopted a principle-based approach, relying on the patient's clinical presentation, including her reported symptoms, functional limitations, and response to previous treatments. This approach, rooted in fundamental Ayurvedic principles, guided our treatment plan, emphasizing a holistic perspective that addressed the patient's individual needs and aimed to restore balance and well-being.

The Ayurvedic assessment identified the patient's condition as "Prushthagraha" [13] (stiffness in the low back) with "Niram" (devoid of ama). Based on the "Upashay-Anupashay" analysis, the absence of symptom exacerbation following "Snehana-Swedana" indicated a

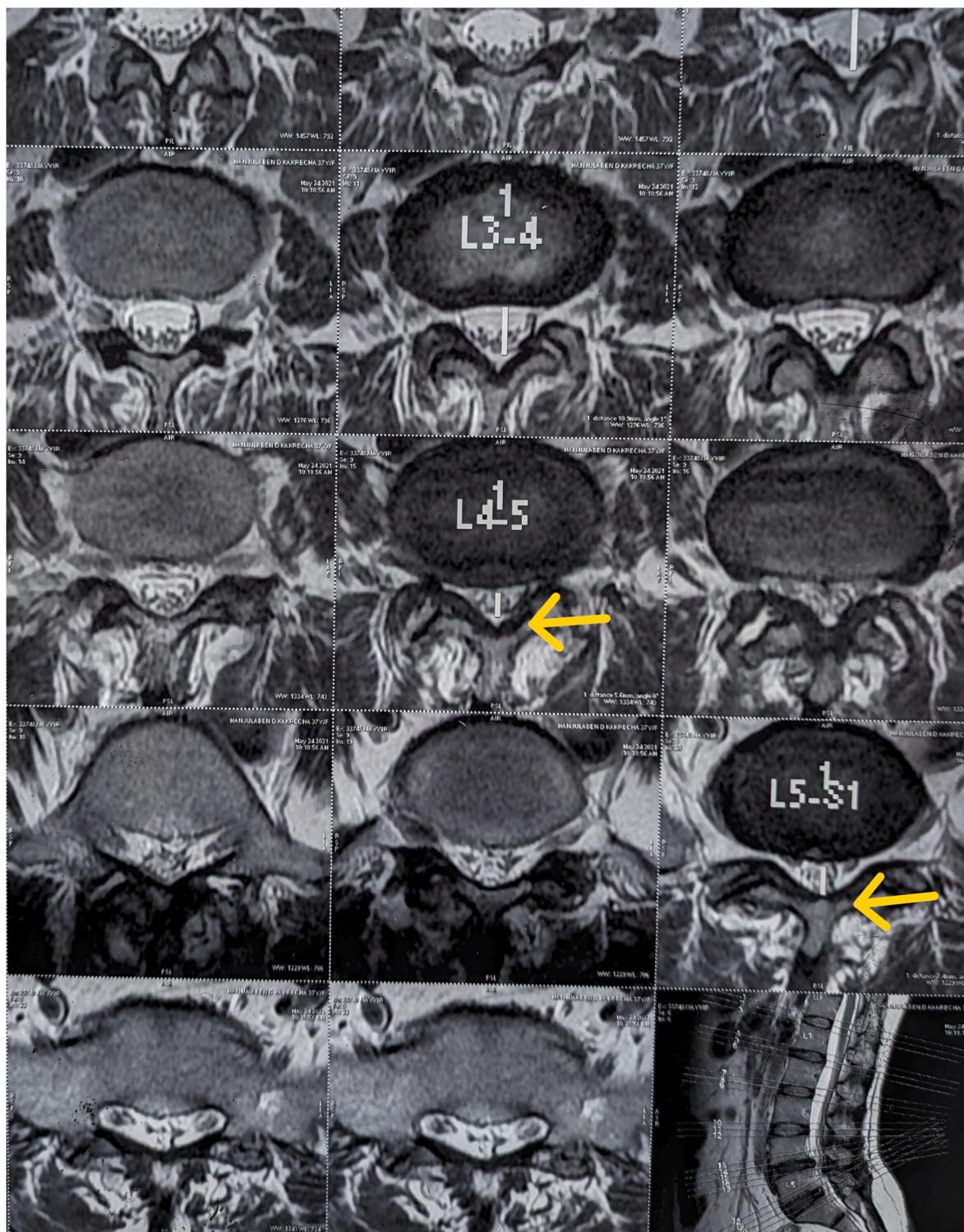


Fig. 2. Sagittal T2-weighted MRI of the lumbar spine demonstrating postcentral protrusions of the intervertebral discs at the L4-L5 and L5-S1 levels.

“Niram Avastha.”

The patient presented with symptoms consistent with “Prushthagraha,” a traditional Ayurvedic diagnosis. We differentiated this condition from “Ghridhrasi” (sciatica) due to the absence of specific radiating pain patterns characteristic of sciatica. Notably, the patient’s gait did not exhibit the typical “vulture-like” pattern associated with Ghridhrasi, further supporting our diagnosis.

3. Ayurvedic management

Ayurveda classifies *Prushthagraha* (stiffness in the low back) as a *Nanatmaj Vatavyadhi* [13], typically managed with *Snehana* (therapeutic oleation), *Swedana* (sudation therapy), and *Mridu Samshodhana* (puri- fication therapy) [14]. Given to incorporate preference against *Mridu Samshodhana* procedures, a treatment plan incorporating *Snehana*, *Mardana* means moderate pressure massage, *Swedana*, and oral Ayurvedic medications were implemented (Table 1):

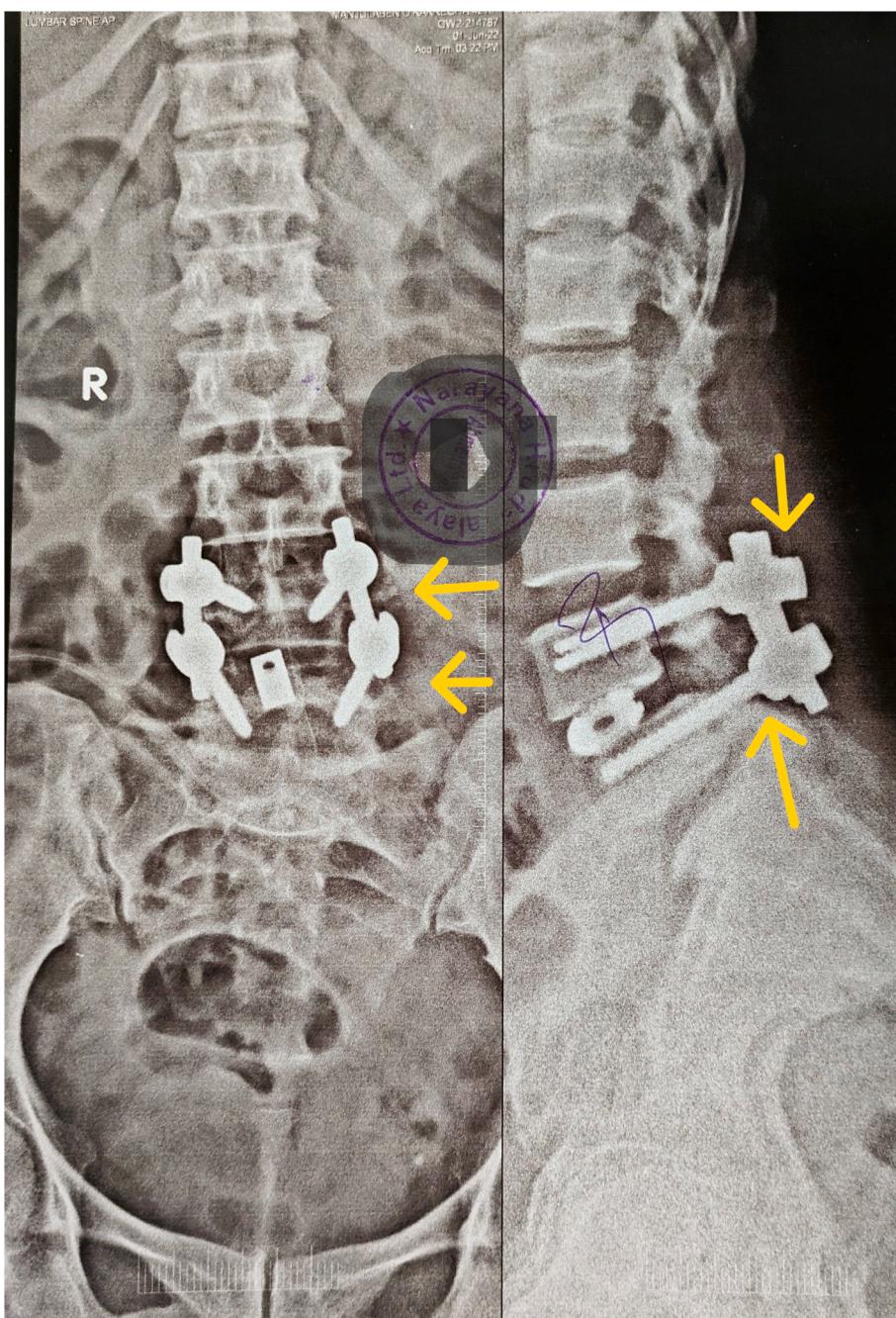


Fig. 3. Postoperative lumbar spine x-ray: status post L4-L5 TLIF, Decompression, and posterior fixation.

- The patient was admitted from August 28, 2023 to September 4, 2023 and given following treatment
Panchakarma/Purvakarma

The patient underwent *Sarvang Abhyanga- Mardana*—massage with sesame oil followed by *Sarvang Bhaspa Swedana* - steam therapy with *Dashmool Kwatha* for the initial eight days, followed by 35 days of oral Ayurvedic medications. Prior to conducting the Panchakarma procedures, we obtained the patient's written consent.

- *Sarvang Abhyanga-Mardana*

Sarvang Abhyanga was administered daily by a female therapist in a dedicated *Panchakarma* treatment area. The procedure involved the application of approximately 100 ml of lukewarm sesame oil to the entire body, with particular emphasis on the lumbar region and

bilateral lower extremities. The massage was performed using gentle pressure and lasted for 30–45 minutes per session.

- *Swedana*

Following *Sarvang Abhyanga*, *Swedana* (sudation therapy) was administered using a steam cabinet connected to a steam generator. The generator was filled with a decoction of *Dashmool* herbs, which was heated to produce steam. The patient remained in the steam cabinet for approximately 10 minutes, or until perspiration was observed. Subsequently, *Nadi Sweda* (localized steam therapy) was applied to the lumbar region and bilateral lower extremities:

- *Shaman Chikitsa* (Oral Ayurvedic medicines)

1. *Trayodashang Guggulu*: Dose – 250 mg 3 times a day. As per *Aushadhishevan Kala*; *Abhaktakala* (7 a.m.), *Vyanakala* (1 p.m.), and *Udanakala* (9PM) with hot water.

Table 1

Summary of patient presentation, diagnosis, treatment, and outcomes.

| Timeline | Symptoms | Diagnostic and outcome assessment | Treatment |
|----------------|---|--|--|
| June 2021 | Low back pain, stiffness, | Lumbar disc herniation | Conservative treatment |
| January 2022 | Low back pain, stiffness | Lumbar disc herniation | Conservative treatment |
| May 2022 | These symptoms aggravated with leg pain | Prolapsed Intervertebral Disc (PIVD) | Spinal surgery- L4-5 fixation, Posterior decompression with TLIF. |
| August 2023 | Recurrent symptoms after surgery | Prolapsed Intervertebral Disc (PIVD) | NSAIDs |
| August 2023 | Recurrent symptoms after surgery | Prusthagraha ODI score-42 VAS -LBP-7 VAS -LBP-6 ESLR- +(20) 0 Walking distance -80 meters | <i>Panchakarma</i> : moderate pressure Massage (Mardana over the lower back) the whole body with plain sesame oil, followed by sudation therapy with a sudation box. |
| | | | Shaman Chikitsa: 1. <i>Trayodashang Guggulu</i> 250 mg 3 times a day. 2. <i>Simhanada Guggulu</i> 250 mg 3 times a day 3. <i>Dashmool Kwatha</i> 10 ml 2 times a day after food |
| September 2023 | Recurrent symptoms | Prusthagraha ODI score-22 VAS -LBP-3 VAS -LP-3 ESLR- +(40) 0 Walking distance -500 meters | Shaman Chikitsa: 1. <i>Yograj Guggulu</i> 250 mg 3 times a day. 2. <i>Navjeevan Rasa</i> 250 mg 3 times a day. 3. <i>Dashmool Kwatha</i> 10 ml 2 times a day after food. |
| October 2023 | Recurrent symptoms | Prusthagraha ODI score-18 VAS -LBP-3 VAS -LP-2 ESLR- +(40) 0 Walking distance -1000 meters | Shaman Chikitsa: 1. <i>Yograj Guggulu</i> 250 mg 3 times a day. 2. <i>Navjeevan Rasa</i> 250 mg 3 times a day. 3. <i>Dashmool Kwatha</i> 10 ml 2 times a day after food. |

2. *Simhanada Guggulu* -Dose -250 mg 3 times a day. As per *Aushadhishevan Kala; Abhaktakala* (7 a.m.), *Vyanakala* (1 p.m.), and *Udanakala* (9PM) with hot water.
3. *Dashmool Kwatha* -10 ml 2 times a day after food with cold water. As per *Aushadhishevan Kala Vyana Kala* (1PM), and *Udana Kala* (9PM).

Contents:

1. *Trayodashang Guggulu* (*Bhaishajyaratnavali Vatavyadhi Adhikar* 98–101), contains Babula, Ashwagandha, Hapusha, Guduchi, Shatavari, Gokshura, Vraddhadaru, Rasna, Shatavha, Shatee, Yavani, Sunthi, Guggul, and Ghee.
2. *Simhanada Guggulu* (*Bhaishajyaratnavali Aamvatadhikar*) Trifala, Shuddha Gandhaka, Guggulu, Chitra Taila - castor oil.
3. *Dashmool Kwatha*- Bilva, Agnimantha, Gambhari, Shyonaka, Patla, Brihati, Shalaparni, Kantakari, Gokshura, Prishnparni.

Rationale - Ayurveda recommends *Snehana* (*Abhyanga*), *Mardanam*, *Swedana*, and *Mridu Samshodhana* due to the *Vata* dominant condition.

The recommended treatment for *Snehana-Swedana* includes oil massage and sudation therapy. *Trayodashang*, *Simhanada Guggulu* treats low back pain and leg pain. *Dashmool Kwatha* relieves both pain and inflammation, and balances *Vata*:

- The patient was treated at home and visited for follow up. During this period the following treatment was given (from September 5, 2023–October 10, 2023)
- *Shaman Chikitsa* (Oral Ayurvedic medicines)
 1. *Yograj Guggulu* – Dose 250 mg 3 times a day. As per *Aushadhishevan Kala Abhaktakala* (7 a.m.), *Vyanakala* (1 p.m.), and *Udanakala* (9PM) with honey.
 2. *Navjeevan Rasa* – Dose 250 mg 3 times a day. As per *Aushadhishevan Kala Abhaktakala* (7 a.m.), *Vyanakala* (1 p.m.), and *Udanakala* (9PM) with honey.
 3. *Dashmool Kwatha* –10 ml 2 times a day after food. As per *Aushadhishevan Kala Vyana Kala* (1PM), and *Udana Kala* (9PM).

Contents:

1. *Yograj Guggulu* (*Bhaishajyaratnavali Aamvata Chikitsa* 29/153/ 161) Chitraka, Pippali Moola, Yavani, Karavi, Ajamoda, Jeeraka, Devadaru, Chavya, Ela, Saindhav, Kushta, Rasna, Gokshura, Triphala, Trikatu, Twak, Usheera, Dhanyaka, Yavagraj, Taleespatra, Patra, Guggulu, Ghee.
2. *Navjeevan Rasa* (*Shiddha Bheshaja Manimala*) Kuchala, Loha Bhasma, Trikatu, Rasasindhura, Ardraka.

Rationale - *Yograj Guggulu* effectively mitigates the three *Doshas* and possesses *Rasayana* properties, which promote rejuvenation. It is recommended for the therapy of all *Vata* diseases. *Guggulu* exhibits anti-inflammatory and analgesic properties. It prevents the development of degenerative changes in bones and joints. It alleviates inflammation, discomfort, and rigidity in joints. Previous studies using drugs have confirmed that *Guggulu* can help reduce inflammation and pain in albino rats *Navjeevan Rasa*, a *Rasayana*, contains strychnine seeds. Strychnine seeds have an analgesic effect. Thus, it was used.

Daily monitored walks were encouraged. Lifestyle modifications, including activity modification to minimize lumbar strain, stress reduction techniques, and dietary recommendations emphasizing freshly prepared foods like *Mudgayusha* and *Mudgakrushara* while avoiding spicy foods (“*Katu Rasa*”) [15], were advised. In accordance with Ayurvedic principles, which recommend a *Drava* (liquid), *Ushna* (hot), and *Anabhyashandi* (compatible) diet during *Swedana* therapy, specific dietary recommendations were provided to the patient. These guidelines aimed to support the therapeutic effects of sudation and promote overall well-being.

4. Outcome measures

The following standardized scales were utilized to assess treatment efficacy:

1. **Oswestry Disability Index:** The ODI [16] was used to evaluate the patient's functional disability related to LBP. The ODI score is categorized as follows: 0–4 (no disability), 5–14 (mild disability), 15–24 (moderate disability), 25–34 (severe disability), and 35–50 (complete disability). Scores were recorded on days 1, 8 (day of discharge), and 44 (follow-up appointment) and compared.
2. **Visual Analogue Scale:** The VAS, a self-reported measure of pain intensity, was used to assess both LBP and leg pain. Patients rated their pain on a scale of 0 (no pain) to 10 (worst pain imaginable). VAS scores were recorded on days 1, 8, and 44 and compared.
3. **Extended Straight Leg Raise Test:** The ESLR test was performed to assess for lumbar radiculopathy. A positive test, indicating potential L5 or S1 nerve root involvement, is characterized by pain radiating

down the affected leg when the hip is passively flexed with the knee extended, particularly at an angle less than 45°. The patient's ability to perform the Extended Straight Leg Raise Test was assessed on three occasions: day 1 (treatment initiation), day 8, and day 44 (treatment conclusion). The results of these assessments were documented and compared to evaluate the treatment's impact on hamstring flexibility and potential nerve root impingement.

4. Walking Distance: Ambulation distance was measured as a functional indicator of improvement. Patients were instructed to walk at a comfortable pace for as long as tolerable, both during their inpatient stay and after discharge. Walking distances were recorded on days 1, 8, and 44 and compared.

The patient exhibited a favorable tolerance to all interventions, including Panchakarma and Ayurvedic medicine, with no reported adverse drug reactions.

5. Discussion

This case study investigates the use of Ayurvedic medicine in treating recurrent lumbar spondylolisthesis following surgical intervention. Spondylolisthesis, a condition involving the forward slippage of a vertebra, often leads to spinal instability, nerve compression, and limited treatment options in conventional medicine.

This report details the case of a patient with recurrent lumbar spondylolisthesis who underwent 43 days of Ayurvedic treatment, including a combination of herbal medicines and Panchakarma therapies. The treatment protocol, incorporating Guggulu, Sarvang Anbyanga, Mardana-Swedana, Dashmool Kwatha, and Trayodashang Guggulu, aimed to alleviate pain, reduce inflammation, and improve functional mobility.

Outcome measures, including the Oswestry Disability Index, Visual Analogue Scale, Extended Straight Leg Raise Test, and walking distance, were used to assess treatment efficacy. Results showed significant improvements in ODI and VAS scores for both low back pain and leg pain, indicating reduced pain and improved functionality. While the ESLR test remained unchanged, the patient's walking distance increased considerably. Notably, no adverse effects were reported.

Our treatment plan incorporated Guggulu, a potent herb recognized for its analgesic, anti-inflammatory, and antioxidant properties. Additionally, Guggulu has been shown to offer gastroprotective, hypolipidemic, hypoglycemic, and cardioprotective benefits [17].

Dashamool Kwatha is reported to possess analgesic and anti-inflammatory properties [18], which likely contributed to its effectiveness in managing the patient's pain and discomfort. Based on our clinical experience and the positive response observed during the initial eight days of inpatient treatment, we decided to continue the use of Dashamool decoction for pain management. The patient was advised to continue taking this decoction at home as part of her ongoing treatment plan.

A previous case report [19] described the successful Ayurvedic treatment of a 46-year-old female patient presenting with a diffuse posterior bulge and right paracentral extrusion of the L4-5 intervertebral disc. This extrusion caused thecal sac indentation and transverse nerve root compression. Pre-treatment, the inferior displacement of the extruded disc measured 8 × 5 mm. Following 15 days of Ayurvedic medications and Panchakarma therapies (massage, sudation, and Basti) combined with 2.5 months of oral Ayurvedic medications, the patient experienced significant improvements in pain, discomfort, and a reduction in disc extrusion. Post-treatment measurements showed the inferior displacement of the extruded disc reduced to 4 × 3 mm.

This case study informed the treatment approach in our present case, which involved a similar patient presentation but with recurrent lumbar spondylolisthesis following surgical intervention.

This case study, while limited by its single-case design and lack of post-treatment imaging, suggests that Ayurvedic management may be

beneficial for recurrent lumbar spondylolisthesis. The absence of post-treatment MRI limits our ability to assess the structural changes in the lumbar spine following Ayurvedic intervention. A longer follow-up period would strengthen the validity of our findings and provide insights into the long-term efficacy of Ayurvedic treatment. The findings align with previous research highlighting the effectiveness of Ayurveda in managing spondylolisthesis and a similar case study demonstrating significant improvements in a patient with lumbar disc herniation following Ayurvedic treatment.

6. Conclusion

This case report highlights the potential of Ayurvedic treatment in alleviating recurrent low back pain, disability, and leg pain following posterior decompression with TLIF. The patient demonstrated significant improvements in pain and disability, as evidenced by reduced ODI, and VAS scores for both low back and leg pain, after undergoing 43 days of Ayurvedic treatment. Notably, this improvement was achieved without the use of conventional medications.

Further research, particularly large-scale Randomized clinical trials including imaging studies, and longer follow-up periods, are necessary to validate these findings and investigate the potential structural modifications associated with Ayurvedic treatment for recurrent lumbar spondylolisthesis.

Authors' contributions

1. Satyajit Pandurang Kulkarni – Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing - original draft, Writing- Review and editing, Visualization.

2. Pallavi Satyajit Kulkarni – Conceptualization, Methodology, Investigation, Data curation, Writing - original draft, Visualization.

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Declaration of generative AI in scientific writing

Statement: During the preparation of this work the author(s) used [Grammarly premium] in order to [avoid grammatical errors]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Author contributions

SK-writing, visualization, formal analysis, compilation of data, review and editing.

PK- writing, visualization, formal analysis, compilation of data.

Informed consent for publication

The authors affirm that they have secured written consent from the patient to utilize his photographs, laboratory reports, or imaging scans in both electronic and print scientific journals for the purpose of advancing scientific knowledge.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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