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RECEIVED 09 January 2024

ACCEPTED 13 May 2024

PUBLISHED 31 May 2024

CITATION

Paudel S, Paudel CAM and Silwal K (2024) Case Report: Integrative naturopathic approach for the management of sequestered lumbar disc herniation with neurological impairments: a case series with two year follow up. *Front. Pain Res.* 5:1367683. doi: 10.3389/fpain.2024.1367683

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Case Report: Integrative naturopathic approach for the management of sequestered lumbar disc herniation with neurological impairments: a case series with two year follow up

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Lumbar Disc Herniation (LDH) is a common condition, and contemporary pain research emphasizes the importance of adopting a comprehensive biopsychosocial perspective in pain treatment for positive clinical outcomes. Integrated Naturopathy and Yoga (INy) is a non-invasive medical system that takes a holistic and patient-centric approach to healing diseases. However, there is limited evidence on the effectiveness of INy, particularly in managing Sequestered LDH. We present two cases of patients experiencing radicular low back pain, lower limb weakness, and neuro-claudication who opted for conservative naturopathic management with INy. Following the INy treatments, both patients reported gradual relief from lower back pain, radicular pain, and neurological deficits. These findings are significant and contribute valuable evidence, suggesting that INy could be a viable therapeutic approach for managing sequestered LDH. This represents the first report on a non-invasive method for resolving sequestered LDH by utilizing INy.

KEYWORDS

lumbar disc herniation, disc sequestration, conservative treatments, naturopathy, case series

Introduction

Lumbar disc herniation (LDH) is a prevalent condition, impacting a range of 5–20 cases per 1,000 adults (1). LDH includes five recognized subtypes: bulging discs, focal protrusions, broad-based protrusions, extrusions, and sequestrations, with the latter being the most severe form (2). Sequestrations are the free fragments of nucleus pulposus and annulus fibrosus separated from the intervertebral disc in patients with LDH that may lead to severe symptoms, and neurological deficits, increasing the likelihood of surgical intervention (3). Existing evidence suggests a high natural tendency for sequestrations to regress, highlighting the promising effectiveness of conservative management (4, 5). A prospective cohort study showed that although operated patients initially had better pain and disability score improvements, there were no significant differences compared to patients with spontaneous regression by the 6th month (2).

Conservative management for disc herniation includes addressing ergonomics, postural care, counseling, home-based exercises, physical therapy, and the use of

medicines (6). Additionally, spinal manipulation has been reported to be successful in inducing regression of LDH (7, 8), further broadening the spectrum of non-surgical options available. Nevertheless, these approaches, while valuable, may not fully address the complex biopsychosocial factors involved in pain management. Contemporary pain research underscores the crucial role of adopting a comprehensive perspective in treatment to achieve favorable clinical outcomes (9).

In response to these limitations, Integrated Naturopathy and Yoga (INY) emerge as a promising alternative. INY represents a non-surgical system of medicine that adopts a holistic and patient-centric approach to healing diseases (10). This approach incorporates a range of treatment modalities including counseling, manipulative therapy, hydrotherapy, therapeutic fasting, diet therapy, yoga therapy, heliotherapy, physiotherapy, acupressure, and acupuncture (11). Such a comprehensive method has not only demonstrated promising effects in alleviating pain and enhancing the functional quality of life in other musculoskeletal disorders but has also shown efficacy in comparison to physical therapy for managing non-specific low back pain (11–13). However, the available evidence on the effectiveness of INY in the management of sequestered LDH is currently limited. This prompted the presentation of two cases of sequestered LDH managed with INY in this study. The inclusion of INY in the management of sequestered LDH, therefore, offers a novel avenue for treatment that potentially mitigates the necessity for surgical interventions and aligns with the growing emphasis on holistic, patient-centered care.

The National Institute for Health and Care Excellence (NICE) guidelines (14), along with recommendations from the North American Spine Society (NASS) (15) and Spine surgery and related research guidelines (16), suggest surgical intervention only for the cases where conservative management proves ineffective or in situations of severe cauda equina syndrome and lower limb weakness. In line with both patients' preference for a non-surgical approach and backed by evidence of successful outcomes for sequestered LDH through conservative management (4, 17); an INY treatment plan was designed.

Case 1

A 38-year-old man visited our clinic with complaints of radiating back pain, weakness in his right lower limb, and neuro-claudication. Physical examination revealed muscle weakness in his right extensor hallucis longus (grade 1/5) and dorsiflexors (grade 1/5). He faced difficulty walking, and there was a considerable impact on his activities of daily living (ADL). The sensation was diminished in the right L5 dermatome. Bowel and bladder functions were normal, the straight leg raising (SLR) test was positive at 60 degrees in the right leg, and reflexes were diminished (+1). MRI of the lumbar spine indicated herniated discs at L3/L4 and L4/L5, along with a sequestered LDH at L3/L4 with caudal migration. He was taking NSAIDs, adjuvants (pregabalin), multivitamins (neurase), vitamin D and calcium tablets. Opting against surgery due to his sister's history of failed

back surgery syndrome, the patient chose conservative treatment at our integrative naturopathic clinic. He received treatment (see [Supplementary File S1](#)) on an outpatient basis. He started having some relief within a few days of treatments. Following four months of INY, the patient reported gradual and significant relief from radiating lower back pain and neurological deficits. Subsequent examinations, including physical examination and the straight-leg raising test, showed normal results with MRI showing resolution of the sequestered LDH (see [Table 1](#) and [Figure 1](#)). Medications were gradually tapered, and the patient received advice on postural care, work ergonomics, and lifestyle changes during follow-up visits.

Case 2

A 39-year-old man presented with a similar complaint of back pain radiating to the left lower limb, accompanied by claudication. Physical examination revealed muscle weakness in the left Plantar Flexors (grade 3/5). Like the previous case, he experienced difficulty walking, significantly impacting his ADL. The sensation was diminished on the left S1 dermatome. Bowel, and bladder functions were normal, but the SLR test was positive at 60 degrees in the right leg and 45 degrees in the left leg. MRI of the lumbar spine indicated herniated discs at L4/L5 and L5/S1, along with a sequestered LDH at L5/S1. This sequestered LDH caused cranial migration, resulting in spinal stenosis and compression of the cauda equina and transversing nerve roots. The patient was taking NSAIDs, adjuvants (pregabalin), vitamin B12, and B1 tablets. Despite doctors recommending surgery, he chose conservative management. After 15 days of inpatient treatments with complete bed rest followed by out-patient sessions and follow-ups; (see [Supplementary File S1](#)) the patient reported relief from radiating lower back pain and neurological deficits. Following 10 months of INY, the patient demonstrated substantial improvement in symptoms and the MRI showed minor persistence of LDH but showed resolution of the sequestered fragment (see [Table 1](#) and [Figure 1](#)).

Discussion

Both cases in the present study showed significant long-term improvement in symptoms of LDH as well as regression of sequestered LDH utilizing INY. This aligns with existing evidence that sequestered LDH can naturally regress without resorting to surgery as reported by Gugliotta et al. (6). A systematic review done by Chiu et al. found that spontaneous regression rates differed depending on the type of disc herniation; 96% for sequestration, 70% for extrusion, 41% for protrusion, and 13% for bulging. They concluded that sequestered and extruded LDH serves as a predictive factor for regression (5). Another randomized control trial by Weinstein et al. reported that patients in both the surgery and the non-surgical treatment groups improved substantially over 2 years emphasizing the preference for conservative management as the

TABLE 1 Prognosis chart.

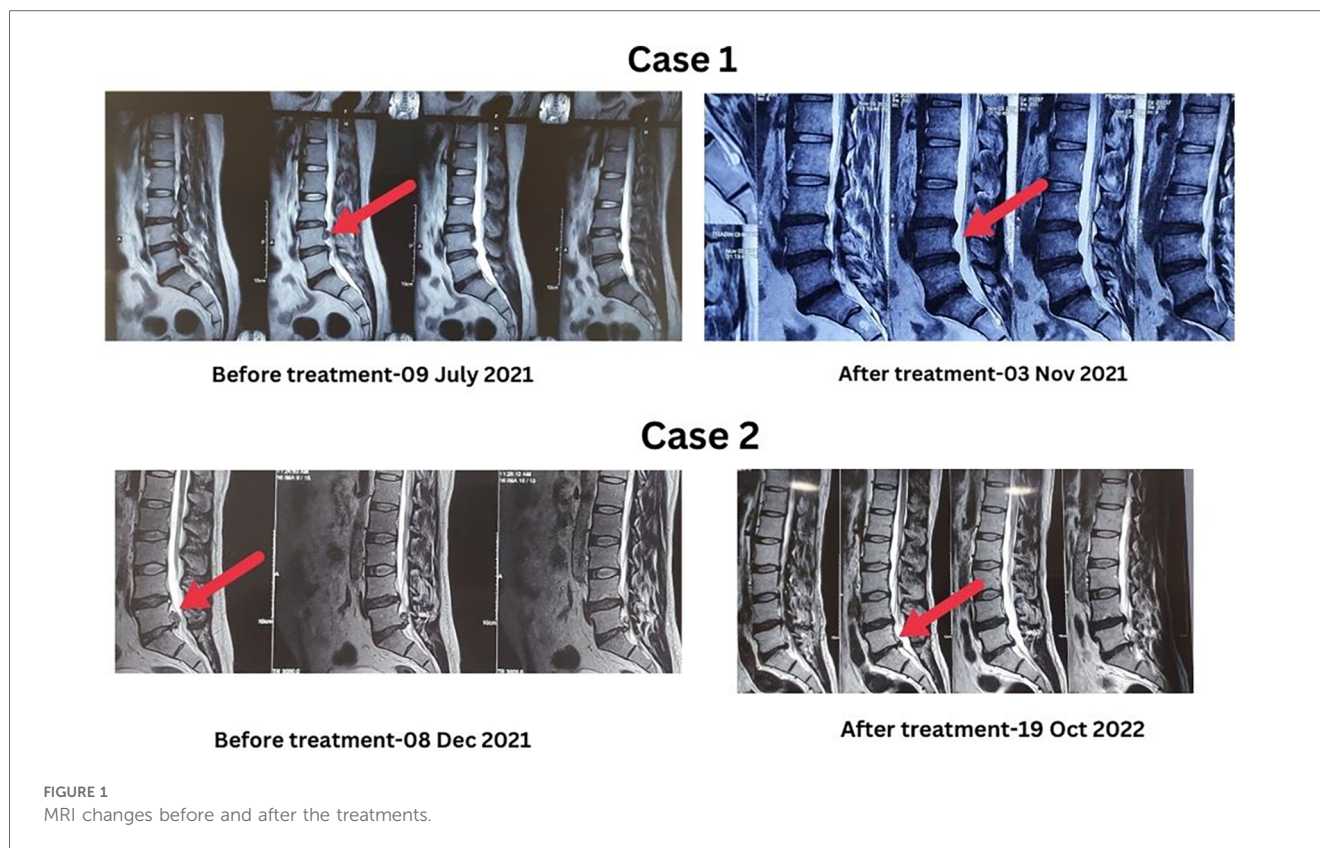
Cases	Parameters	Before treatment	After treatment	Follow up
Case 1		09 July 2021	03 Nov 2021	02 Dec 2023
	MRI scan	*L3-L4 Disc Extrusion, caudal migration and sequestration	*No sequestration	-
		*L4-5 minor LDH	L4-5 minor LDH persistent	
	NPRS	6	1	0-1
	Spinal flexibility	Diminished	Normal	Normal
	SLR test	Positive at 60 degrees in right leg	Negative	Negative
	Reflexes	Knee jerk: 1+	Knee jerk: 2+	Knee jerk: 2+
	Muscle power of affected muscle			
	Right Dorsiflexors	1/5	4-/5	5/5
	Right Extensor hallucis longus	1/5	4-/5	5/5
	Heel walking	Unable to walk	Better	Normal
	Toe walking	Normal	Normal	Normal
	Sensory	Diminished on right L5 dermatome	Normal	Normal
	Muscle tone	Normal	Normal	Normal
	Muscle bulk	Normal	Normal	Normal
	Bowel/bladder involvement	None	None	None
Saddle anesthesia/paresthesia	None	None	None	
Functional ability	Unable to walk and work for more than 10 min	Able to walk and work with intermittent rest	Functionally active and normal	
Case 2		08 Dec 2021	19 Oct 2022	02 Dec 2023
	MRI scan	**L5-S1 Disc sequestration with cranial migration	*No sequestration	-
		*L4-5 minor LDH	*L4-5 minor LDH persistent	
		*L5-S1 minor Retrolisthesis and disc protrusion	*L5-S1 minor Retrolisthesis and disc protrusion: slightly better	
	NPRS	7	2	0
	Spinal flexibility	Diminished movements	Normal	Normal
	SLR	Positive at 60 degrees on the right leg and 45 degrees on the left leg	Positive at 70 degrees on the right leg and 60 degrees on the left leg	Negative
	Reflexes	Knee/heel jerk 2+	Knee/heel jerk 2+	Knee/heel jerk 2+
	Muscle power of affected muscle			
	Left plantar flexors	3+/5	5/5	5/5
	Heel walking	Normal	Normal	Normal
	Toe walking	Unable	Better	Normal
	Sensory	Diminished on left S1 dermatome	Normal	Normal
	Muscle tone	Normal	Normal	Normal
	Muscle bulk	Normal	Normal	Normal
	Bowel/bladder involvement	None	None	None
Saddle anesthesia/paresthesia	None	None	None	
Functional ability	On total bed-rest	Neuroclaudication after walking more than 10 min Able to walk and work with intermittent rest	Functionally Active and normal	

NPRS, numeric pain rating scale; SLR, straight leg raising; L3, lumbar 3; L4, lumbar 4; L5, lumbar 5; S1, sacral 1; LDH, lumbar disc herniation.

primary approach for sequestered LDH and associated complications (17, 18).

The likely mechanism behind the regression of sequestered discs involves an inflammatory response triggering immune cell-mediated degradation and neovascularization (19). Macrophages play a crucial role in enhancing phagocytosis of the herniated tissue and breaking it down using lysosomal enzymes (20). Kang et al. demonstrated that herniated discs release high levels of matrix metalloproteinases, nitric oxide, interleukins 6, and

prostaglandin E2 (21). This indicates that the primary mechanism behind resolving LDH, especially the sequestered LDH are attenuating the inflammation, matrix remodeling, and shrinkage of nucleus pulposus back into the intervertebral space due to gradual dehydration and retraction (19, 22, 23). Oktay et al. (24) observed that a decrease in the herniation ratio is linked with clinical improvement, while Kong et al. (21) found that patients may experience symptom relief even if their disc herniation does not show radiological improvement. While both



studies were retrospective and included patients who opted not to undergo surgery, this could introduce potential bias. However, more studies are required to evaluate and correlate spontaneous disc regression with clinical outcomes.

INY is a holistic healing system that operates based on the Healing Power of Nature (*Vis Medicatrix Naturae*) (25), and views inflammation as a process necessary to restore normal bodily function (26). INY approach advocates supporting the body's healing process by creating a conducive environment through elements such as rest, different therapeutic modalities, a proper diet, correct posture, and a positive mindset (25). An earlier study by Nair et al. has reported the positive impact of modalities such as hydrotherapy, massage, acupuncture, diet therapy, sun exposure, and yoga in reducing pain and improving the quality of life in patients with musculoskeletal disorders (11). The present study also used a similar approach in line with naturopathic principles that are aimed at nurturing the natural progression of inflammation and assisting holistic healing. There are systematic reviews and randomized control trials supporting the effectiveness of individual modalities such as acupuncture (27), yoga (28), psychotherapy (29), postural care and physical therapy (30) in managing non-specific low back pain. Nevertheless, there was still a gap in understanding the effectiveness of these modalities in integration, especially in the case of sequestered LDH. This case series serves as the foundation for further exploration.

We also observed a decrease in radiating low back pain, alongside improvements in sensations, muscle power, flexibility,

and functional movements. Both cases had no return of symptoms throughout the two-year follow-up period, indicating the long-term efficacy of INY-based lifestyle treatments. The first patient's sequestered disc resorbed within 4 months, and the second patient within 8 months, with no reported adverse events. The period of resolution appeared to be shorter with INY compared to previous findings, where the average duration was 9 months (4), indicating that INY may have a role in accelerating LDH resorption.

While these findings are compelling and contribute valuable evidence for considering INY as a viable therapeutic approach in managing sequestered LDH, the study has limitations. First, as a case series with only two cases, generalization is limited. Second, the observed regression may be natural or a cumulative effect of treatment and natural regression. Therefore, future randomized control trials with adequate power and sample size are warranted to validate the efficacy of INY in sequestered LDH management. Nonetheless, this is the first report on a novel non-surgical approach to successfully treating sequestered LDH as well as neurological deficits associated with it.

Patient's perspective

Both patients conveyed satisfaction with their progress after opting for a non-surgical and cost-effective therapy to address their conditions.

Data availability statement

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Spark health home ethical committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

SP: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing. CP: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing. KS: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The reviewer PN declared a past co-authorship with the author KS to the handling editor.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpain.2024.1367683/full#supplementary-material>

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