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A Conceptual Review of Gridhrasi Lakshana According to Brhattrayi with Special Reference to Lumbar Radiculopathy (Sciatica) Correlated with Modern Diagnostic Modalities.

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Abstract: ***Background:*** *Gridhrasi is described in Ayurveda as a Vataja Nanatmaja Vyadhi characterized by pain beginning in the Sphik (gluteal region) and radiating down the Kati, Prshtha, Uru, Janu, Jangha and Pada, with stiffness, pricking pain and restricted lifting of the limb. It closely resembles lumbar radiculopathy (sciatica) in modern medicine, which results from compression or irritation of lumbosacral nerve roots and presents with low back pain, radiating leg pain, sensory disturbance and motor weakness.*

Aim: *To present a conceptual review of Gridhrasi lakshana as described in the Brhattrayi (Charaka, Susruta, Astanga Hrdaya) and to correlate them with the clinical features of lumbar radiculopathy and findings obtained through modern diagnostic modalities such as MRI, EMG, nerve conduction studies, X-ray and clinical provocative tests.*

Materials and Methods*: A narrative literary review was performed using classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya) for Gridhrasi lakshana, and standard modern neurology and orthopaedic references and review articles for the clinical features and diagnostic criteria of lumbar radiculopathy. Lakshana of Gridhrasi were systematically listed and juxtaposed with the symptom complex of lumbar radiculopathy. Modern diagnostic modalities were described in terms of how they objectify the same clinical features.*

Results: *Gridhrasi lakshana — Ruk/Shoola (radiating pain), Toda (pricking pain), Stambha (stiffness), Spandana (twitching), Sakthikshepa-nigraha (restricted raising of the leg), Gaurava (heaviness), Tandra and Aruchi (in Vata-Kaphaja type) — closely correspond to low back pain with sciatic leg pain, paresthesia, restricted straight leg raising, motor weakness and reflex changes seen in lumbar radiculopathy. MRI and EMG/nerve conduction studies objectively demonstrate the structural and functional nerve root involvement that explains these symptoms.*

Conclusion: *The Brhattrayi descriptions of Gridhrasi conceptually and clinically parallel the symptomatology of lumbar radiculopathy. Modern diagnostic modalities serve as objective tools that corroborate the classical clinical picture, supporting an integrative diagnostic approach and strengthening the scientific understanding of Gridhrasi in the light of contemporary neurology.*

Keywords: Gridhrasi, Brhattrayi, Charaka, Susruta, Astanga Hrdaya, Lumbar Radiculopathy, Sciatica, Conceptual Review, MRI, EMG, Modern Diagnostic Modalities

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I. INTRODUCTION

The Brhattrayi — Charaka Samhita, Susruta Samhita and Astanga Hrdaya — form the core textual foundation of classical Ayurveda. Within these treatises, various Vataja Vyadhi are described, including Gridhrasi, a disorder predominantly affecting the lower limb. Gridhrasi is characterized by pain radiating from the gluteal region and low back to the thigh, knee, calf and foot, associated with stiffness, pricking sensation, twitching and difficulty in moving the limb. The gait of the patient, who walks as though limping like a vulture (gridhra), is said to give the disease its name. These lakshana strongly resemble the clinical manifestations of lumbar radiculopathy (sciatica) described in modern neurology and orthopaedics.

Lumbar radiculopathy is a clinical condition resulting from compression or irritation of a lumbosacral spinal nerve root, most commonly due to lumbar disc herniation, degenerative spondylosis, or foraminal and lateral recess stenosis. It presents with low back and leg pain, dermatomal sensory symptoms, motor weakness and reflex changes, which can now be accurately assessed with modern diagnostic modalities such as MRI, EMG, nerve conduction studies and X-ray. Understanding how Gridhrasi in the Brhattrayi corresponds to lumbar radiculopathy is crucial to integrating classical diagnostic frameworks with contemporary neuro-musculoskeletal science. This conceptual review therefore focuses on three layers:

(1) the Brhattrayi-based description of Gridhrasi lakshana, (2) the modern symptom complex of lumbar radiculopathy, and (3) the way modern diagnostic tools substantiate this correlation.

II. AIM AND OBJECTIVES

Aim

To carry out a conceptual review of Gridhrasi lakshana according to the Brhattrayi and to correlate them with the clinical features and modern diagnostic profile of lumbar radiculopathy.

Objectives

1. To compile the classical descriptions of Gridhrasi lakshana from Charaka, Susruta and Astanga Hrdaya Samhita.
2. To summarize the key clinical symptoms and signs of lumbar radiculopathy from modern medical literature.
3. To compare Ayurvedic lakshana of Gridhrasi with modern symptoms of lumbar radiculopathy in a structured manner.
4. To outline the main modern diagnostic tools (MRI, EMG, nerve conduction studies, X-ray, clinical tests) relevant to lumbar radiculopathy, highlighting how they correspond to the clinically observed lakshana.

III. MATERIALS AND METHODS

Study Design

- Conceptual, narrative literary review.
- No primary clinical data were collected; this is an analytical synthesis of classical and modern literature.

Ayurvedic Sources (Brhattrayi-Oriented)

1. Charaka Samhita – Chikitsa Sthana 28 (Vatavyadhi Chikitsa), where Gridhrasi is explicitly described with its types.
2. Susruta Samhita – Nidana Sthana 1 (Vatavyadhi Nidana), describing Gridhrasi and its cardinal features.
3. Astanga Hrdaya – Nidana Sthana 15 (Vata Vyadhi Nidana), describing Gridhrasi.

Modern Medical Sources

- Standard neurology and orthopaedic texts and review articles covering:
- Definition and pathogenesis of lumbar radiculopathy.
- Clinical presentation (pain pattern, sensory changes, weakness, reflex changes).
- Role of MRI, X-ray, EMG and nerve conduction studies.

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Method of Review and Correlation

1. **Listing Ayurvedic Lakshana:** Gridhrasi lakshana from the Brhattrayi corpus were collected and organized into pain, sensory, motor, stiffness, movement restriction and functional categories.
2. **Listing Modern Symptoms:** Lumbar radiculopathy signs and symptoms were similarly categorized.
3. **Symptom-by-Symptom Correlation:** Each Ayurvedic lakshana was matched with the closest modern description based on location, character and effect on function.
4. **Diagnostic Mapping:** Modern diagnostic tools were described in terms of how they demonstrate structural or functional changes corresponding to the symptom complexes described classically.

IV. REVIEW OF LITERATURE :

Ayurvedic review :

A. Ayurvedic Samhita (Brhattrayi) Part – Gridhrasi Lakshana.

1. Charaka Samhita – Chikitsa Sthana 28 (Vatavyadhi Chikitsa)1

Charaka describes Gridhrasi in the context of Vata Vyadhi Chikitsa. The classical description, given here in transliteration, runs along these lines:

sphik-pūrvā kaṭī-pṛṣṭha-ūru-jānu-jaṅghā-pādaṃ kramāt | gṛdhrasī stambha-ruk-toda-gṛhṇāti spandate muhuḥ ||

- Sphik-purva, kati, prshtha, uru, janu, jangha, pada – Pain begins at the gluteal region and travels successively to the waist, back, thigh, knee, calf and foot.
- Stambha – Stiffness of the affected limb.
- Ruk – Pain.
- Toda – Pricking, needle-like pain.
- Spandana (muhuh) – Frequent twitching or throbbing of the limb.

Charaka further distinguishes two types: Vataja Gridhrasi, with the above features, and Vata-Kaphaja Gridhrasi, in which Tandra (drowsiness), Gaurava (heaviness) and Aruchi (anorexia, loss of taste) are additionally present.

2. Susruta Samhita – Nidana Sthana 1 (Vatavyadhi Nidana)2

Susruta describes Gridhrasi as a Vata Vyadhi in which the patient is unable to lift the leg properly because of severe pain, and in which the affection runs along the course from the Sphik to the foot. The key feature emphasized is:

- **Sakthi-kshepa-nigraha** – Restriction in raising or throwing the leg forward, indicating limitation of movement due to pain and stiffness.
- **Ruk and Toda** – Radiating and pricking pain along the posterior aspect of the lower limb.
- **Kandara involvement** – Description of the Kandara (large tendon-like structures) as the seat of the disorder, in later commentaries.

3. Ashtanga Hridaya – Nidana Sthana 15 (Vata Vyadhi Nidana)3

Vagbhata follows the same pattern as Charaka and Susruta, describing the stabbing and pricking pain starting in the buttock and extending downward, accompanied by stiffness and twitching. He also describes the Vata-Kaphaja variety with heaviness, drowsiness and anorexia. Disability in walking and in lifting the limb is a prominent clinical feature.

4. Consolidated Gridhrasi Lakshana from Brhattrayi Tradition

From the above, the consolidated Gridhrasi lakshana are:

- **Ruk / Shoola** – Radiating pain: Sphik – Kati – Prshtha – Uru – Janu – Jangha – Pada.
- **Toda** – Pricking, needle-like pain along the limb.
- **Stambha** – Stiffness of the back and lower limb.
- **Spandana** – Twitching or throbbing in the limb.
- **Sakthikshepa-nigraha** – Restricted raising of the leg; difficulty in walking.
- **Gaurava** – Heaviness of the limb (Vata-Kaphaja type).
- **Tandra and Aruchi** – Drowsiness and loss of appetite (Vata-Kaphaja type).

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Collectively, these lakshana indicate that Gridhrasi is a Vata-dominant neuromuscular disorder characterized by pain, sensory disturbance, stiffness, movement restriction and functional disability. These features closely parallel the clinical manifestations of lumbar radiculopathy described in contemporary neurology.

V. MODERN VIEW

B. Modern Symptoms of Lumbar Radiculopathy

Lumbar radiculopathy is a neurological syndrome resulting from compression or irritation of one or more lumbosacral nerve roots. The most common etiological factors include lumbar intervertebral disc herniation, lumbar spondylosis, facet and ligamentum flavum hypertrophy, and lateral recess or foraminal stenosis. The L4, L5 and S1 roots are most frequently involved, and compression produces pain, sensory disturbance, motor weakness
and reflex abnormalities corresponding to the affected dermatome and myotome.4–8

1. Low Back Pain

Low back pain is a common accompaniment and is frequently associated with paraspinal muscle spasm and stiffness. It is typically aggravated by bending, lifting, prolonged sitting, coughing or sneezing.4,5

2. Radiating Leg Pain (Sciatica)

Radicular pain radiates from the buttock down the posterior or lateral aspect of the thigh and leg, often below the knee, along the distribution of the affected root. Patients commonly

describe the pain as sharp, shooting, burning or electric shock-like.4–6

3. Paresthesia

Irritation of the sensory root produces tingling, burning or pins-and-needles sensations in the dermatomal distribution:

- L4: Medial leg and medial malleolus.
- L5: Lateral leg, dorsum of the foot and great toe.
- S1: Lateral foot, little toe and sole.

4. Numbness (Sensory Loss)

Persistent compression of sensory fibres leads to hypoesthesia in the corresponding dermatome. Careful sensory examination helps localize the affected root.4,5

5. Motor Weakness

- L4: Weakness of knee extension (quadriceps) and ankle dorsiflexion.
- L5: Weakness of great toe extension (extensor hallucis longus) and ankle dorsiflexion – foot drop in severe cases.
- S1: Weakness of plantar flexion (gastrocnemius–soleus) and difficulty with toe walking. Patients report difficulty in walking, climbing stairs and standing on the toes or heels.4–7

6. Reflex Changes

- L4: Reduced knee (patellar) reflex.
- S1: Reduced or absent ankle (Achilles) reflex.

These findings support clinical localization of the affected root.4,6

7. Stiffness and Restricted Movement

Pain-induced muscle spasm results in restricted lumbar flexion and an antalgic posture or gait. Limitation of straight leg raising is a characteristic finding.5,6

8. Provocative Clinical Features

The Straight Leg Raising (SLR/Lasègue) test reproduces radicular pain, typically between 30° and 70° of hip flexion, and is sensitive for L5 and S1 root irritation. The crossed SLR is less sensitive but highly specific. Other tests include Bragard's sign, the slump test and, for upper lumbar roots (L2–L4), the femoral nerve stretch test.5,7

9. Chronic Neurological Manifestations

- Muscle wasting (atrophy) of the calf or thigh.

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- Persistent motor weakness and foot drop.
- Chronic sensory deficits.
- Functional disability affecting activities of daily living.

EMG and nerve conduction studies help identify chronic denervation and objectively assess the severity of neurological

Gridhrasi Lakshana (Brhattrayi)	Clinical Meaning	Modern Lumbar Radiculopathy Symptom
Ruk / Shoola in Sphik–Kati–Ur u–Janu–Jangha–Pada	Radiating pain from buttock to foot	Low back pain with sciatic leg pain in dermatomal distribution
Toda	Pricking, needle-like pain	Neuropathic, shooting or burning radicular pain; paresthesia
Stambha	Stiffness of back and limb	Lumbar stiffness, paraspinal spasm, reduced ROM
Spandana	Twitching or throbbing of the limb	Muscle fasciculations; EMG evidence of denervation in chronic cases
Sakthikshepa-nigraha	Inability to raise the leg	Restricted straight leg raising (positive SLR)
Gaurava	Heaviness of the limb	Subjective heaviness or fatigue of the affected limb
Gait difficulty / functional loss	Limping, difficulty walking	Antalgic gait, motor weakness, foot drop
Tandra, Aruchi (Vata-Kaphaja)	Drowsiness, loss of appetite	Non-specific systemic features of chronic pain and sleep disturbance

involvement.6–8

The principal clinical manifestations of lumbar radiculopathy include low back pain, radiating leg pain, paresthesia, numbness, motor weakness, diminished deep tendon reflexes, restricted spinal and straight-leg movements, and chronic neuromuscular deficits. These manifestations closely correspond to the classical Ayurvedic descriptions of Ruk (Shoola), Toda, Stambha, Spandana, Sakthikshepa-nigraha and Gaurava described in Gridhrasi, providing a strong conceptual basis for correlating the two conditions.

C. Correlation of Ayurvedic and Modern Symptoms

This correlation shows that the Brhattrayi description of Gridhrasi precisely captures the same clinical dimensions that modern neurology identifies in lumbar radiculopathy: pain distribution, sensory disturbance, motor deficit, stiffness, movement restriction and functional impairment.

D. Modern Diagnostic Tools in Lumbar Radiculopathy

1. Magnetic Resonance Imaging (MRI) – Lumbosacral Spine

MRI is considered the imaging modality of choice for evaluating lumbar radiculopathy because it provides excellent visualization of soft tissues, intervertebral discs, nerve roots, the thecal sac and neural foramina without ionizing radiation.

Role –

- Visualizes intervertebral discs, nerve roots, cauda equina and foramina. Detects –
- Disc herniation or protrusion.
- Lateral recess and foraminal stenosis.
- Osteophyte complexes and facet hypertrophy.

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- Nerve root compression.

Relevance to symptoms: Radiating pain and sensory loss often match the level of disc or foraminal pathology (most commonly L4–L5 and L5–S1). Imaging findings must always be correlated clinically, as disc abnormalities are also common in asymptomatic individuals.

2. Electromyography (EMG) and Nerve Conduction Studies (NCS)

Electrodiagnostic studies evaluate the functional integrity of peripheral nerves and muscles. They are particularly valuable when clinical findings and imaging are inconclusive or when differentiation from peripheral neuropathy is required.

- **EMG detects**: denervation potentials (fibrillations, positive sharp waves) and reduced recruitment patterns.
- **NCS detects:** reduced amplitude of compound muscle action potentials; sensory nerve action potentials are typically preserved in radiculopathy, which helps distinguish it from peripheral neuropathy.
- **T**hese tests objectify Sakthikshepa-nigraha and functional loss, and the chronic neural involvement suggested by Spandana and persistent sensory symptoms.

3. X-ray Lumbosacral Spine

Plain radiography remains an important initial investigation because of its wide availability, low cost and ability to detect degenerative bony abnormalities.

Role: Simple, widely available imaging for bony changes –

- Disc space narrowing.
- Osteophyte formation.
- Spondylolisthesis and alignment abnormalities.

Relevance to symptoms: Supports chronic degenerative changes that may underlie stiffness (Stambha) and chronic pain. It does not directly show nerve root compression, but suggests risk.

4. Clinical Neurological Examination and Provocative Tests

- Myotome and dermatome testing directly map to the regions described in Ayurveda as Sphik, Uru, Jangha and Pada.
- Tests like the SLR (Lasègue) test provoke radicular pain similar to how the restriction of leg raising described as Sakthikshepa-nigraha is observed clinically.

Modern diagnostic modalities therefore do not create a new disease picture; they confirm and refine what the Brhattrayi already capture clinically in the description of Gridhrasi.

VI. DISCUSSION

Gridhrasi is a well-recognized Vataja Vyadhi described in the Brhattrayi, primarily affecting the lower extremity. The present conceptual review demonstrates that the Ayurvedic description of Ruk (Shoola), Toda, Stambha, Spandana and Sakthikshepa-nigraha closely corresponds to the characteristic symptoms of lumbosacral nerve root compression.1–8

According to the Charaka Samhita, Gridhrasi begins at the Sphik and progresses sequentially to the Kati, Prshtha, Uru, Janu, Jangha and Pada, with Stambha, Ruk, Toda and

Spandana.1 This progressive downward course closely resembles the dermatomal radiation

of sciatic pain. Susruta emphasizes restriction of limb movement,2 comparable to a positive SLR, while Astanga Hrdaya reinforces the description, including the Vata-Kaphaja variety.3

One of the most significant correlations observed in the present review is between Ruk (Shoola) and radicular pain. In Ayurveda, Ruk and Shoola denote severe pain radiating through the lower limb, whereas modern medicine explains this symptom as irritation of lumbosacral nerve roots, with pain following a dermatomal distribution. Likewise, Toda corresponds to paresthesia and neuropathic pain caused by irritation of sensory nerve fibres. These similarities indicate that classical Ayurvedic clinicians accurately recognized the sensory manifestations of lower limb neurological disorders through careful clinical observation.1,2,4,5

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Similarly, the Gridhrasi lakshana of restricted limb movement and gait difficulty reflect impairment of lower limb function, comparable to the motor weakness, antalgic gait and foot drop observed in lumbar radiculopathy. In modern clinical practice these deficits are objectively evaluated by neurological examination, EMG and NCS, which demonstrate denervation and reduced motor unit recruitment.5–8

From a modern medical perspective, lumbar radiculopathy results from compression or irritation of one or more lumbosacral nerve roots due to intervertebral disc herniation, spondylosis, osteophyte formation or stenosis. This pathology produces low back pain radiating to the leg, paresthesia, sensory loss, motor weakness, diminished reflexes and restriction of movement.4–8 These manifestations closely parallel the lakshana described for Gridhrasi in the

VII. AYURVEDIC TEXTS

The integration of modern diagnostic modalities further strengthens this conceptual correlation. MRI demonstrates disc prolapse, stenosis, osteophyte formation and nerve root compression responsible for the patient's symptoms. EMG and NCS objectively assess the functional status of the affected roots and muscles, while clinical neurological examination localizes the involved segment based on dermatomal sensory loss, myotomal weakness and reflex abnormalities. These investigations provide objective evidence supporting the clinical manifestations described in Ayurveda.

The present review highlights that Ayurveda and modern medicine approach the same clinical condition from different perspectives. Ayurveda explains Gridhrasi in terms of Vata Dosha (with Kapha anubandha in one type), and involvement of Snayu, Kandara and Sandhi, whereas modern medicine attributes the disease to lumbosacral nerve root compression. Despite these conceptual differences, both systems describe similar sensory, motor and functional abnormalities. Integrating Ayurvedic clinical assessment with contemporary diagnostic modalities may therefore improve understanding of the disease and facilitate a more comprehensive diagnostic approach.

VIII. CONCLUSION

The present conceptual review demonstrates that the classical descriptions of Gridhrasi in the Brhattrayi show a close conceptual and clinical resemblance to the modern clinical entity of lumbar radiculopathy (sciatica). The Ayurvedic lakshana, including Ruk (Shoola), Toda, Stambha, Spandana, Sakthikshepa-nigraha and Gaurava, correspond to the characteristic manifestations of lumbosacral nerve root compression, such as low back pain, radiating leg pain, paresthesia, restricted straight leg raising, motor weakness and functional disability.1–8

Among the Brhattrayi, Charaka Samhita, Susruta Samhita and Astanga Hrdaya all provide explicit descriptions of Gridhrasi, highlighting the predominant role of aggravated Vata Dosha, with Kapha anubandha in the Vata-Kaphaja type, affecting Snayu, Kandara and other musculoskeletal structures, resulting in pain, stiffness, sensory disturbance and impaired lower limb function.1–3

Modern diagnostic modalities such as MRI, EMG, NCS and detailed neurological examination objectively demonstrate the structural and functional abnormalities responsible for lumbar radiculopathy. These investigations complement the Ayurvedic clinical assessment by confirming nerve root compression, motor dysfunction and sensory impairment, thereby strengthening the conceptual correlation between Gridhrasi and lumbar radiculopathy.4–8

IX. FUTURE SCOPE

Future prospective clinical studies incorporating Ayurvedic clinical assessment, neurological examination, MRI findings and electrodiagnostic investigations are needed to validate the proposed correlation. Standardized diagnostic criteria integrating classical Ayurvedic lakshana with contemporary neurological parameters may improve the scientific understanding and clinical management of Gridhrasi.

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