



MRI EVALUATION OF THE LUMBAR SPINE IN PATIENTS WITH CHRONIC LOW BACK PAIN**Dr. Tamanna Gupta**

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ABSTRACT

Aim: We evaluated the prevalence of MR imaging characteristics associated with lumbar spine degeneration in patients with low back pain. Evaluating the patients based on the degree of disc bulge correlating findings on MRI aimed in establishing the role of MRI in prompt diagnosis to determine the degree of disc herniation.

Materials and Methods: Patients were examined individually for the following outcomes:

- degree of disc bulge
- disc degeneration
- disc extrusion
- disc protrusion
- annular fissures
- modic changes
- central canal stenosis
- spondylolisthesis, and
- spondylolysis.

Results : Low back pain was reported by 65 patients . 52 of them (80%) met the inclusion criteria; 13 patients had a normal MRI, disc bulging (50%), spondylolysis (20%), disc extrusion (5%), MODIC 1 changes (10%), disc protrusion (5%), and disc degeneration (10%).

The degree of disc bulge in the upper lumbar levels showed considerable radicular complaints in symptomatic low back pain patients linked with degenerative changes, which were more prevalent in the elderly population with a higher pain scale.

Conclusion: When used to diagnose the underlying cause of chronic low back pain, MRI is a good technique for assessing the degree of disc bulge along with associated symptoms in symptomatic individuals, as well as examining degenerative diseases of the spine.

Introduction:

Low back pain affects up to two-thirds of all adults at some point in their lives(1). Back pain-related disability has major economic effects, including increased healthcare costs and decreased productivity (2).

The goal of this study is to assess the correlation between various features of lumbar degenerative disc degeneration and MRI results. Plain X-rays with antero-posterior (AP) and lateral views can reveal significant changes in the gross anatomy of intervertebral disc. The lateral view of an X-ray is optimal for visualizing this.

MRI is the preferred imaging method for diagnosing disc pathology due to its low radiation, multiplanar imaging capability, greater soft-tissue contrast, and accurate localization of intervertebral disc changes. Imaging findings(3) such as disc bulge and disc protrusion extrusion, are often interpreted as causes of back pain, leading to medical and surgical interventions(4). However, prior studies have shown that imaging findings of spinal degeneration associated with back pain are present in both symptomatic and asymptomatic individuals, limiting their diagnostic value on MRI.

Material and Methods :

The study was performed in the department of Radio-diagnosis, Dhiraj Hospital, S.B.K.S. Medical Institute and Research Centre, Pipariya, Vadodara.

The study is Observational, Descriptive Hospital Based Study.

Inclusion criteria:

- Only those patients who were willing to participate in study were included.
- Patients who presented with or without complains low back pain, lower limb radiculopathy were included.

The study comprised 65 individuals who underwent MRI Lumbosacral spine at the institute. The analysis included both case-control and cross-sectional studies. The patient's symptoms were often identified during the MR imaging examination. Individuals with a history of chronic low back pain, such as axial back pain, sciatica, or radiculopathies, should seek treatment. Participants were in age from 15 to 50 years.

In order to determine whether the studies met the inclusion criteria and to omit any that were unrelated to the topic under investigation, one reviewer looked at the abstracts of the studies that were found through the literature search (ie, neck pain, studies correlating CT or radiographs and low back pain, review articles, and so forth). A standard form was utilized to abstract imaging findings for each study that satisfied the inclusion criteria. The imaging findings that we searched for involved central spinal canal stenosis, disc degeneration, annular fissures (including high-intensity zones), disc bulge, disc protrusion, disc extrusion, modic changes, spondylolisthesis, and spondylolysis.

Patients underwent examinations, and the disc bulge served as a criterion to distinguish between mild, moderate, and severe radicular pain. Patients were then grouped according to their level of pain, and the disc bulge and age factor were correlated. Based on the results, conclusions regarding chronic low back pain and radicular pain were made.

Results:

A search showed up 65 distinct studies. 52 individuals (80%) fulfilled the inclusion criteria, with 37 (71%) being male and 15 (29%) being female. Imaging results showed that disc bulging (50%) spondylolysis (20%) disc extrusion (5%) Modic 1 changes (10%) disc protrusion (5%), and disc degeneration (10%) were more common in symptomatic people 50 years of age or younger. Results from 10 studies evaluating modic change (30%), central canal stenosis (25%) high-intensity zone, annular fissures, and spondylolisthesis were not linked to low back pain.



(Axial, Saggital T2/STIR images show focal disc protrusion at the level of L2-L3 vertebral disc space indenting anterior thecal sac compressing bilateral lateral recess and abutting the spinal cord causing mild narrowing of spinal canal)

FINDINGS	Number of Studies	Percentage
Disc bulge	42	80%
Disc protrusion/extrusion	24	45%
Modic 1 changes	33	62.5%
Spondylolysis	36	70%
Spondylolisthesis	26	50%
Central spinal canal stenosis	6	12.5%
High intensity zones	10	20%

MRI results ranged from disc bulging severity to degenerative changes in symptomatic patients (n = 52).

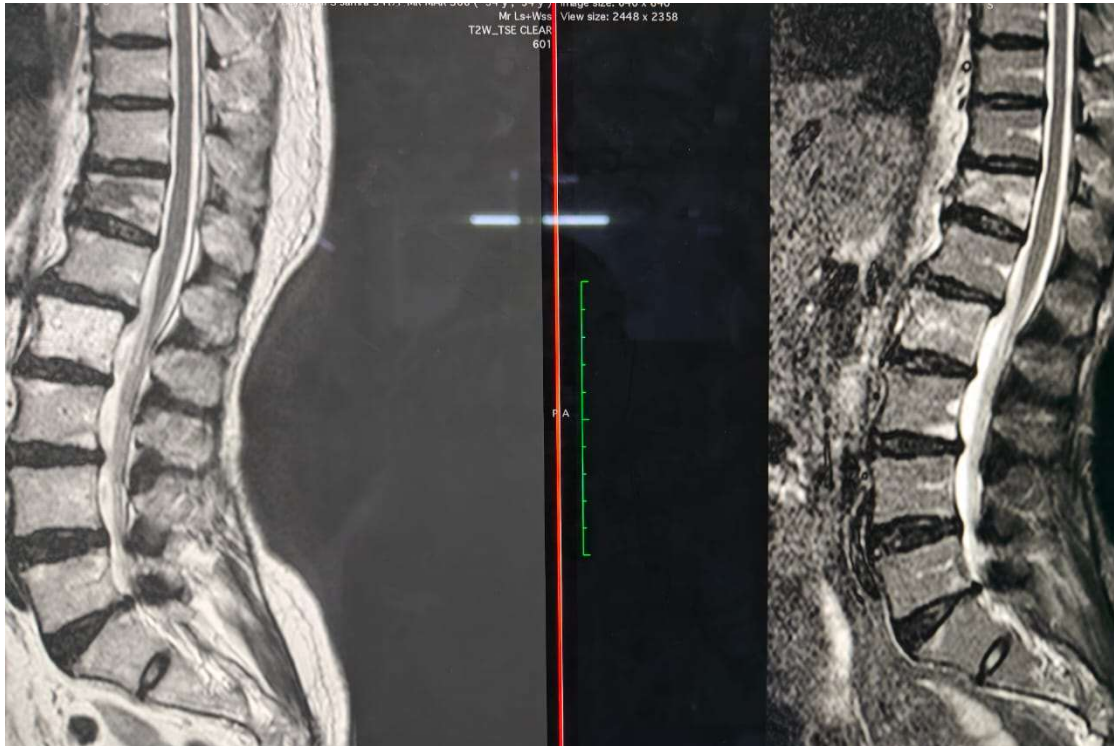
S.No	Age group	Radicular symptoms	Pain scale	Degree of disc protrusion
1	15-25Y	30%	2-3	Mild
2	25-30Y	28%	2-3	Moderate
3	30-35Y	42%	3-4	Moderate
4	35-40Y	50%	3-4	Mild
5	40-45Y	45%	4-6	Moderate
6	45-50Y	60%	4-6	moderate

Patients were categorized according to their age, the degree of disc bulging, and whether they were experiencing bilateral or unilateral lower limb radicular pain (n = 40).

Findings suggest that the association between disc bulge and low back pain may be more significant in older adults with significant degenerative changes, recorded bilateral radicular presentation. In contrast, association between disc bulges and low back pain was lower in middle age population with less degenerative changes, the study group recorded a lower pain scale.



Sagittal T2 weighted images showing multiple degenerative changes schmorl's node(L3) noted at multiple lumbar levels with straightening of lumbar spine with diffuse posterior disc bulge(L2-L3) and altered signal intensity in multiple lumbar body levels



SAGITTAL T2WI L2-L3, L3-L4 L5-S1 vertebral levels show posterior disc buldges indenting anterior thecal sac .

DISCUSSION:

The study had 52 patients; degenerative spine findings are more common in people 50 years of age or younger who self-report low back pain. Degeneration is the most common spinal condition seen in society that presents with low back pain. It was observed that the patients' symptoms overlapped (8).

Disc abnormalities, such as disc bulging (50%) in symptomatic persons, were part of the prompt diagnosis of degenerative spine. When patients of different age groups were compared, the degree of disc bulge was evaluated, the symptoms were compared using a pain scale, and only 30% of the patients in the 15–25 age group had mild posterior disc bulge but only non-specific chronic low back pain. When the patients with higher ages were assessed using the specified parameters, the patient with the older age group (45–50 years) had a majority of radicular symptoms, including severe disc protrusions and a pain scale of 7-9 .

CONCLUSION

The results of the study show that magnetic resonance imaging (MR imaging) is a valuable modality that is indispensable for evaluating the health of the lumbar spine when there is evidence of disc bulge, disc degeneration, and the degree of disc extrusions and protrusions. It also proves useful in assessing patients' radicular pain based on the Modic 1 changes, the pain scale, and spondylolysis and disc protrusions, all of which have significant associations with low back pain in adult patients 50 years of age or younger. The degree of disc bulging and its foraminal extension is seen in patients who report with acute exacerbations of pain in both

young and old patients with chronic low back pain. It is not appropriate to use the correlation between these degenerative findings and pain as proof of causation. These imaging results could be taken into consideration as possible indicators for low back pain (less than 50 years of age). The significance of these results in establishing low back pain treatment plans or prognosis. When used as a diagnostic technique for chronic low back pain, MRI is a great way to determine the degree of disc bulge and related symptoms in patients who are symptomatic as well as to examine degenerative diseases of the spine. It is a dependable method for determining the level of disc bulging and degeneration in symptomatic individuals and for promptly addressing these issues. It also evaluates the severity of the condition and provides targeted management to reduce symptoms in symptomatic individuals.

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