

# Lumber Spine Incidental Findings During Discopathy Evaluation Using MRI

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## Abstract

Magnetic Resonance Imaging (MRI) of the lumbar spine with the standard protocol can be useful in the diagnosis of incidental extraspinal lesions. The study aims to find the frequency and types of incidental findings (IF) of lumbosacral spine MRI in adult patients with suspected discopathy. It was a prospective analytical study involving MRI scans performed on a group of 50 patients (22 males and 28 females) in the age range of 25-85 years old reporting clinically chronic back pain without a history of acute trauma. The data was collected in Yastabshiroon Medical Centre, Khartoum, Sudan between February 2018 and February 2019. The relationship between incidental findings (IF) and patients' age and gender was assessed using a chi<sup>2</sup> squared test. The age ranges of patients less than 35, 36-45 years, 46-55 years, 56-65 years, and more than 65 years comprised 10.0%, 18.0%, 22.0%, 20.0%, and 30% accordingly. All patients had incidental findings, and hemangioma was the most frequent finding (18 patients, 36%) followed by an abscess (15 patients, 30%). There was no significant association between gender and type of diagnosed incidental finding (IF), most frequently IF Lumber reported finding in MRI hemangioma, abscess, and collapse.

**Keywords:** Incidental findings, Lumbar spine, Discopathy, MRI

## INTRODUCTION

Incidental findings are lesions found outside the region of interest that are unrelated to the image request [1]. Magnetic Resonance Imaging (MRI) of the lumbar spine with the standard protocol, which includes sagittal T2- and T1-weighted slices, axial T2-weighted slices, can be useful in the search for incidental extraspinal lesions. Many literatures have shown extraspinal incidental findings (IF) following an MRI of the lumbar spine. Quattrochi *et al.* in 2013 presented that 17.6% of IF found after a review of MRI scans were clinically important [1]. Colonography Reporting and Data System C-RADS were used to classify these IF. In addition, other studies have focused their work on the percentage of detection of these lesions and reports on the accounts rendered [2, 3].

Park *et al.* study focused on spinal cord abnormalities reported MRI of the lumbar spine because a prolapsed intervertebral disc is suspected [4]. Tuncel *et al.* studied the prevalence of and reporting rate of incidental extraspinal in adult outpatients undergoing MRI of the lumbar spine [5].

A cross-sectional study was conducted on individuals who were diagnosed on clinical level with Discopathy and confirmed by MRI reports. The goal of this study was to

investigate the incidence and type of lumbar spinal MRI incidental findings in these individuals [6].

The advantage of magnetic resonance imaging (MRI) is that it has brought significant advances in diagnosing disease and thus treating spinal problems. The opportunity of having a multi-dimensional view of anatomy and high-resolution images of soft tissue as well as the capability to employ various MRI sequences permits an in-depth view of the disk, Fat, nerves, ligaments, and bone without the need for injection of contrast agent or radiation exposure. For this reason, MRI, the primary test of choice for patients with back

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pain, is now being replaced by computer-assisted tumor scans (CT scan) [7].

It is important to know how to handle these findings in imaging. So, detecting the prevalence of these findings, ways to handle them, their impact on the patient, and imaging techniques [6] due to this importance should be reported in reports, and notification of patient is mandatory and lead to timely intervention [8]. Avoid potentially serious consequences for a patient and protect radiologists from involving in medico-legal implications [9].

Ethical and practical discretion implement by a radiologist to report IFs identified on imaging despite it providing little benefit and expose patients to great psychological distress [10].

## MATERIALS AND METHODS

The subject of this prospective analytical study was a population of 22 males (44.0%) and 28 females (56%) who underwent an MRI of the lumbar spine between February 2018 and February 2019. Most patients in the study group experienced clinically chronic back pain, while the exclusion criteria were a history of acute trauma.

All MRI examinations were performed on a 0.35 T MR unit (Toshiba, GE Healthcare) using the body coil and fast spin-echo imaging. The images were obtained in both sagittal (T1- and T2-weighted) and axial planes (T2-weighted). The routine MRI protocol comprised sagittal T1-weighted (repetition time [TR] = 620, echo time [TE] = 127), and axial T2-weighted ([TR] = 3600, [TE] = 119) sequences. Fields of view [FOV] of 34 cm and 27 cm were used for the sagittal and axial imaging, respectively. For the sagittal imaging, a slice thickness of 5mm was used, and a contrast medium was applied if needed. The axial imaging required the use of a slice thickness of 6mm.

The data were analyzed by Statistical Package for the Social Sciences (SPSS), using chi-squared and representing results in tables and figures.

The institutional ethics review board approved this prospective study, and there was no requirement for informed patient consent.

## RESULTS AND DISCUSSION

**Table 1.** Distribution of participants according to age

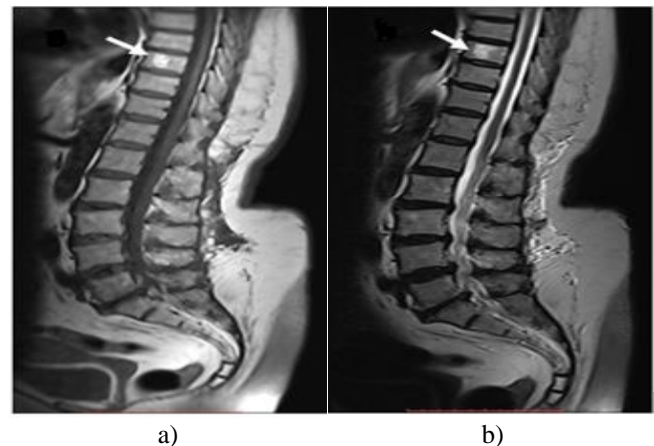
Age/Years	Frequency	Percent
<35	5	10%
36-45	9	18%
46-55	11	22%
56-65	10	20%
> 65	15	30%
Total	50	100%

In terms of distribution, the highest percentage of participants in this study was represented by people in the age of more than 65 years old (15 patients, 30.0%), while the youngest group of patients in the age range of 25-35 years included 5 participants (10.0% of the total number). The age ranges of 36-45 years, 46-55 years, and 56-65 years comprised 18.0%, 22.0%, and 20.0% (**Table 1**).

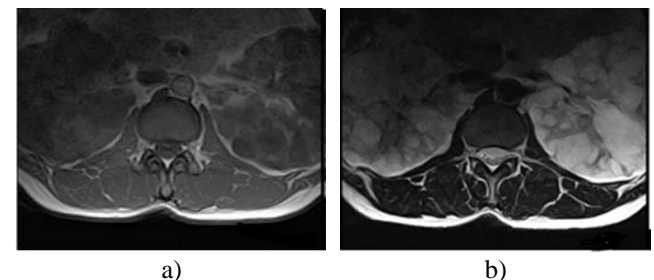
**Table 2.** Distribution of participants according to diagnoses

Diagnoses	Frequency	Percent
Lesion	2	4%
Traumatic collapse	5	10%
Secondary collapse	9	18%
Hemangioma	18	36%
Abscess	15	30%
Cyst	1	2%
Total	50	100%

Hemangioma (**Figure 1**) was the most frequent finding in females (13 patients), followed by an abscess (6 patients) secondary collapse (4 patients), and one patient with Cyst (**Figure 2**)



**Figure 1.** Sagittal T1 and T2- weighted MR images a,b) of the lumbar spine, show a subcentimeter hyperintense lesion on T1. a) and T2-weighted images, b) within the T9 vertebral body (Haemangioma) (arrows).



**Figure 2.** Axial T1-weighted image. a), and Axial T2-weighted image, b), showing innumerable cysts with grossly enlarged kidneys (ADPCK).

**Table 3.** Chi-square test for association of diagnoses and gender

Gender	Diagnoses							Total
	Lesion	Traumatic collapse	Secondary collapse	Hemangioma	Abscess	Cyst		
Male	Count	1	2	5	5	9	0	22
	%	50%	40%	55.6%	27.8%	60%	.0%	44%
Female	Count	1	3	4	13	6	1	28
	%	50%	60%	44.4%	72.2%	40%	100%	56%
Total	Count	2	5	9	18	15	1	50
	%	100%	100%	100%	100%	100%	100%	100%
Chi-Square Tests								
Likelihood Ratio		Value		df			Sig. (2-sided)	
		5.264		5			0.384	

No statistically significant association between age and type of diagnosis was found. there was no significant association between gender and type of diagnosed incidental finding.

**Table 4.** Chi-square test for association of diagnoses and age

Age/Years	Diagnoses							Total
	Lesion	Traumatic collapse	Secondary collapse	Hemangioma	Abscess	Cyst		
<35	Count	0	0	1	2	2	0	5
	%	.0%	.0%	11.1%	11.1%	13.3%	.0%	10%
36-45	Count	0	0	1	6	1	1	9
	%	.0%	.0%	11.1%	33.3%	6.7%	100%	18%
46-55	Count	2	2	1	4	2	0	11
	%	100%	40%	11.1%	22.2%	13.3%	.0%	22%
56-65	Count	0	0	1	2	7	0	10
	%	.0%	.0%	11.1%	11.1%	46.7%	.0%	20%
> 65	Count	0	3	5	4	3	0	15
	%	.0%	60%	55.6%	22.2%	20%	.0%	30%
Total	Count	2	5	9	18	15	1	50
	%	100%	100%	100%	100%	100%	100%	100%
Chi-Square Tests								
Likelihood Ratio		Value		df			Sig. (2-sided)	
		28.637		20			0.095	

In terms of age ranges, hemangioma was reported most frequently in both 36-45 years (6 patients) and 46-55 years (4 patients) age groups, while abscess was the most common incidental finding in patients in the age group 56-65 years (7 patients) and secondary collapse in patients over 65 years old (5 patients).

The detection of incidental findings not related to the main complaint of a patient was elevated due to the increasing number of MRI imaging. The purpose of this study is to determine the incidence and reporting rates as well as the clinical importance finding of spinal incidental findings (IF) detected by MRI of the lumbar spine in adult patients with suspected discopathy.

The impact of incidental findings on patient health outcomes is not certain [11], but it is worth remembering that an

incidental finding may be more significant than the suspected disease that prompted imaging [8].

In the current study, 50 patients underwent an MRI of the lumbar spine (22 males (44.0%) and 28 females (56%)). the highest percentage of participants in this study was represented by people in the age of more than 60 years old (15 patients, 30.0%), while the youngest group of patients in the age range of 25-35 years included 5 participants (10.0% out of 50 patients).

The age ranges of 36-45 years, 46-55 years, and 56-65 years comprised 18.0%, 22.0%, and 20.0% accordingly. **Table 1** is the same as [7]. who conducted Across sectional study from 2016 – 2017 in Al-Hilla teaching general hospital on 805 adult patients with a female-male ratio of 460: 345, age range

18-90 years undergoing lumbosacral spine MRI due to suspected intervertebral disc prolapse using 1.5 T MRI unit. In our study the most frequently reported finding was hemangioma (36.0%), followed by an abscess (30.0%) and secondary collapse (18.0%). In males, an abscess was the most common incidental finding accounting for 9 patients. Secondary collapse and hemangioma were reported in 5 patients each **Table 2**.

Hemangioma was the most frequent finding in females (13 patients), followed by an abscess (6 patients) and secondary collapse (4 patients).

However, the Chi-square test for the association of diagnoses and gender found that there was no statistically significant relationship, and also a negative association between age and type of IF diagnosis was found (**Table 3**) this result agrees with Qasim *et al.* results used, in which the Chi-square test was used to find the relation between incidental findings and patient characteristics. And found that the vertebral haemangioma was the commonest forming (27%), then Tarlov cyst forming (2.7%), ovarian cysts (0.87%), perineural cysts (0.74%), each one of intraspinal mass, renal cysts and nabothian cyst found (0.5%) for each, bone lesion form (0.37%), uterine masses form (0.37%), arachnoid cyst form (0.25 %) and meningocele formed (0.125%). Qasim *et al.* 2018 said that the Incidental finding was not related to patient symptoms. Another study was done by Sobhan *et al.*, 2016 who commonly found single vertebral hemangioma in 31 cases (7.0%) of a total of 444 patients.

In other studies with Eroglu & Yilmaz, Vertebral hemangiomas were common frequent cases found in 5.7% (n = 35), where Tarlov cysts in 3.5% (n = 22), renal cyst in 2.2% (n = 14), Schmorl node in 1.4% 0.3 (n = 2) liver cysts were detected of total 613 patients who underwent Lomber MRI in consideration of Lumbar discopathy [6].

In terms of age ranges, hemangioma was reported most frequently in both 36-45 years (33.3%) and 46-55 years (22.2%) age groups, while abscess was the most common incidental finding in patients in the age group 56-65 years (46.7%) and secondary collapse in patients over 65 years old (55.6%).

No statistically significant association between age and type of diagnosis was found in **Table 4**. this was negative with Qasim *et al.* 2018 who had a significant correlation between the occurrence of these incidental findings concerning patient's age and sex, P-value < 0.001. So Incidental findings are common in clinical practice and increasing.

Sobhan *et al.*, 2016 investigated the prevalence and type of incidental MRI findings of the lumbar spine in patients diagnosed with disc disorders and correlated with our study result [11].

## CONCLUSION

It is common to have Incidental findings in the MRI of individuals with discopathy. The most frequently reported finding was hemangioma (36.0%), However, there was no significant association between gender and type of diagnosis incidental finding also, no statistically significant correlation between age and type of diagnosis was found. So incidental findings are common in clinical practice. Providing information on these findings helps to manage and deal with them and it affects patient health.

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**CONFLICT OF INTEREST:** None

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**ETHICS STATEMENT:** The institutional ethics review board approved this prospective study, and there was no requirement for informed patient consent

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