

The Impact of Coronal STIR Imaging in Routine Lumbar MRI: Uncovering Hidden Causes to Enhanced Diagnostic Yield of Back Pain and Sciatica

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Abstract : Background: Routine lumbar MRIs for back pain may yield normal results despite persistent symptoms, which means the possibility of other causes for this pain, which was not shown on the routine images. Research suggests including coronal STIR imaging to detect additional pathologies like sacroiliitis. Objectives: This study aims to enhance diagnostic accuracy and aid in determining treatment processes for patients with persistent back pain who have normal routine lumbar MRI (T1 and T2 images) by incorporating coronal STIR into the examination. Methods: A prospectively conducted study involving 274 patients, 115 males and 159 females, with an age range of 6-92 years, reviewed their medical records and imaging data following a lumbar spine MRI. This study included patients with back pain and sciatica as their primary complaints, all of whom underwent lumbar spine MRIs at our hospital to identify potential pathologies. Using a GE Signa HD 1.5T MRI System, each patient received a standard MRI protocol that included T1 and T2 sagittal and axial sequences, as well as a coronal STIR sequence. We collected relevant MRI findings, including abnormalities and structural variations, from radiology reports. We classified these findings into tables and documented them as counts and percentages, using Fisher's exact test to assess differences between categorical variables. We conducted a statistical analysis using Prism GraphPad software version 10.1.2. The study adhered to ethical guidelines, institutional review board approvals, and patient confidentiality regulations. Results: Exclusion of the coronal STIR sequence led to 83 subjects (30.29%) being classified as within normal limits on MRI examination. 36 patients without abnormalities on T1 and T2 sequences showed abnormalities on the coronal STIR sequence, with 26 cases attributed to spinal pathologies and 10 to non-spinal pathologies. In addition to that, Fisher's exact test demonstrated a significant association between sacroiliitis diagnosis and abnormalities identified solely through the coronal STIR sequence ($P < 0.0001$). Conclusion: Implementing coronal STIR imaging as part of routine lumbar MRI protocols has the potential to improve patient care by facilitating a more comprehensive evaluation and management of persistent back pain.

Keywords : magnetic resonance imaging, lumbar MRI, radiology, neurology

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