

# MRI Can be Misleading

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## ABSTRACT

**Introduction:** Low back pain (LBP) is a common symptom arising from many potential anatomic sources such as nerve roots, myofascial structures, bone, joints, intervertebral discs, and organs within the abdominal cavity. It's critical to identify the LBP secondary to the other causes. The diagnosis and treatment of patients who have both hip and lumbar spine pathologies may be a challenge because overlapping symptoms may delay a correct diagnosis and appropriate treatment. Common complaints of patients who have both hip and lumbar spine pathologies include low back pain with associated buttock, groin, thigh, and, possibly, knee pain. A thorough patient history should be obtained and a complete physical examination should be performed in these patients to identify the primary source of pain.

**Case description:** Our case report is about a 74-year-old male who presented with complaints of low back pain radiating to his right thigh. A previous MRI spine had been done revealed multiple level disc prolapse at lumbar levels along with L5-S1 anterolisthesis and he was treated for his spine complaints. On examination the hip movements were painful in all directions. We had asked for X-ray pelvis which revealed advanced osteoarthritis and avascular necrosis of right hip. The patient was then referred to orthopaedic speciality where he underwent right total hip replacement.

**Keywords:** Low back pain, MRI spine scan, X-ray pelvis.

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## INTRODUCTION

Low back pain (LBP) is a common symptom arising from many potential anatomic sources such as nerve roots, myofascial structures, bone, joints, intervertebral discs, and organs within the abdominal cavity.<sup>1,2</sup> Symptoms can also spawn from aberrant neurological pain processing<sup>3,4</sup> and are influenced substantially by psychosocial elements.<sup>5-10</sup> Thus, the diagnostic evaluation of patients with LBP often requires complex clinical decision-making.<sup>11</sup>

LBP generated from hip pathology is likely due to the functional interdependence of related regions<sup>12,13</sup> and has been labeled the hip-spine syndrome.<sup>14</sup> Briefly, this syndrome describes altered spinal alignment with changes in transmitted forces and muscle length in the presence of hip pathology. Indirect evidence for this concept is demonstrated by patients with LBP, who also exhibit reduced ROM, strength, and muscular endurance in the hip<sup>15-17</sup> and by those who achieve measurable clinical improvement in LBP symptoms following treatment directed at the hip region.<sup>18,19</sup>

Avascular necrosis of the hip is characterized by the disruption or loss of nutrient blood supply to the femoral head, resulting in progressive osseous breakdown, often leading to a structural failure of the cortical surface.<sup>20</sup> Its etiology can be categorized as traumatic by direct injury to the hip, or non-traumatic by factors such as collagen vascular disease, sickle cell hemoglobinopathy, and possibly long-term exposure to corticosteroid drugs.<sup>21-24</sup> Non-traumatic ON most commonly occurs between the 3rd and 5th decade,<sup>25</sup> exhibiting variable progression, though many cases develop a femoral head collapse within 3 years following diagnosis.<sup>26</sup> In addition to hip pain, patients with ON report a concomitant pain in the low back, buttock, groin, thigh, and knee.<sup>27-29</sup>

Pain from hip osteoarthritis (OA) can be localized to the groin (84%), buttock (76%), anterior thigh (59%), posterior thigh (43%), anterior knee (69%), shin (47%), and calf (29%).<sup>30-32</sup>

## CASE DESCRIPTION

A 76-year-old male patient is presented to our outpatient department with complaints of low back pain radiating to his left

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thigh region. The pain was sharp in quality and exhibited varying intensity. Movements such as walking, twisting the torso, and rising from a chair aggravated his pain. The patient had relief on sitting and lying down on bed. The patient had low back pain, which radiated to his left thigh more along the anterior aspect, sometimes associated with tingling and numbness. No history of allodynia or hyperalgesia is reported. No traumatic incident or injury was reported prior to the symptom onset.

On examination, the patient had an antalgic gait, no muscle atrophy, and scars were seen on inspection. There was tenderness mainly over the right hip region, with mild tenderness over lumbar facet joints on palpation. Sacroiliac joints were nontender. The FABER (Flexion, Abduction and External rotation) test was positive on the right side. The range of motion of the right hip was reduced and painful in all directions. Neurologic assessment revealed no abnormality. The patient had undergone an MRI spine scan (Figs 1 and 2), which revealed grade I anterolisthesis of L5 over S1 vertebra, leading to downward and forward displacement of the neural foramina, resulting in impingement of bilateral L5 nerve roots. Posterior disk bulges from L1-L2 to L4-L5 were noted, resulting in impingement of bilateral L2, L3 and L4 nerve roots along with bilateral facet arthropathy.

Before consulting us, the patient had visited many hospitals for treatment of his spine problems, which did not provide him any relief. We had asked for an X-ray scan of pelvis of his hip joint (Fig. 3),



Fig. 1: MRI spine scan of the patient (lateral view)

which revealed advanced degenerative osteoarthritis with avascular necrosis of the right hip joint, and later, MRI of the hip confirmed the same. We then referred the patient to an orthopedic specialty hospital, where he underwent total right hip replacement (THR) and had resolution of symptoms.

### DISCUSSION

Our patient came with complaints of a typical back pain radiating to the right thigh and finally the diagnosis turned out to be osteoarthritis (OA) of the hip. Hip OA is diagnosed as either primary or secondary as a result of entities such as gout, chondrocalcinosis, or hemochromatosis. Often, hip OA occurs in combination with lumbar stenosis and back pain. Studies have reported that patients with a persistent back pain after THR who underwent management of the lumbar spine have improved symptoms.<sup>33-35</sup> Other studies have reported the resolution of back pain after the management of hip disease in patients who underwent THR or arthroscopic hip

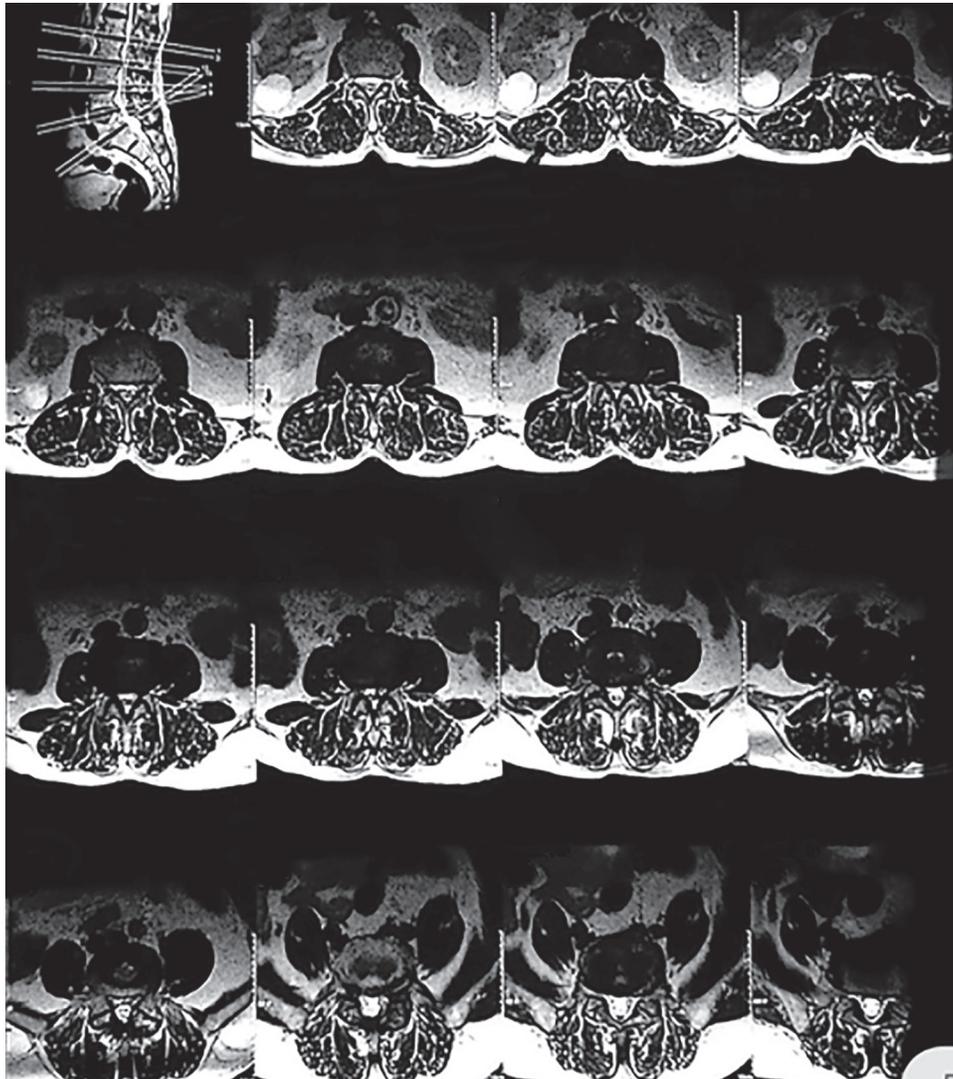


Fig. 2: MRI spine scan of the patient (views from different sections)

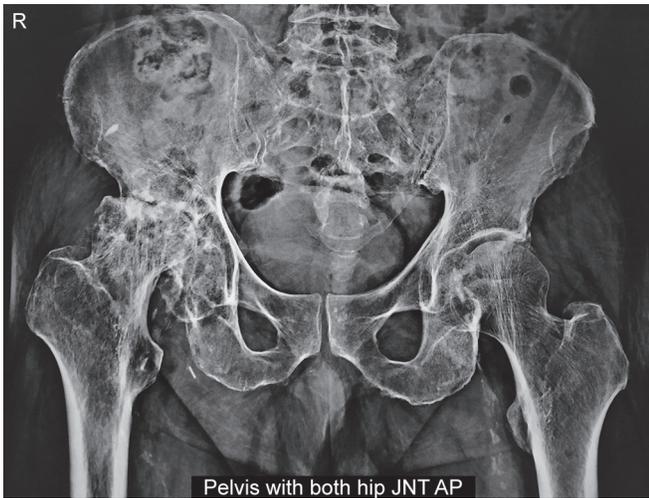


Fig. 3: X-ray pelvis with both hip joint (AP view)

surgery, such as that for the management of a labral tear.<sup>36–38</sup> Risk factors for avascular necrosis of the hip include corticosteroid use, alcohol abuse, sickle cell disease, systemic lupus erythematosus, renal failure, and hematologic disorders.<sup>39</sup> More than 90% of non-traumatic hip ON cases are estimated to occur secondary to alcohol and corticosteroid use possibly via mechanisms that result in fatty infiltration of the bone marrow, leading to intraosseous hypertension, vascular compression, and diminished vascularity to the femoral head.<sup>40,41</sup>

This patient had relief of pain after undergoing total hip replacement (THR). In a study of 25 patients with hip OA and low back pain (LBP) who underwent THR, Ben-Galim et al.<sup>36</sup> reported improvement in both hip and back scores after a follow-up of 2 years. In a retrospective study of 3,206 patients with hip OA (566 of whom also had LBP) who underwent THR, Prather et al.<sup>42</sup> reported that, although all patients had improved pain and hip scores, the patients without LBP had greater improvement in function and pain relief, incurred fewer medical charges per episode of care, and spent fewer days in the hospital per episode of care when compared with the patients who had LBP. In a study of 344 patients with hip OA (170 of whom also had LBP) who underwent THR, Parvizi et al.<sup>38</sup> reported on the resolution of LBP in 66.4% of the 170 patients in whom it was noted preoperatively. In a study of 113 patients with pain extending into the back (21%), shin (7%), and calf (3%) who underwent THR, Hsieh et al.<sup>43</sup> reported complete pain relief in 110 of the patients within 12 weeks postoperatively.

There are many factors that contribute to pain relief after THR. In one study by Offierski and MacNab,<sup>44</sup> they believed that by correcting the flexion deformity of the hip, the pelvic rotation and the hyperlordosis of the lumbar spine in patients with HOA would be overcome, resulting in the relief of spinal symptoms. Weng et al.<sup>45</sup> reported that total hip replacement would reduce the tension of the back muscles and contribute to the relief of low back pain. The total hip replacement would also improve the ROM of the hip, i.e. medial and lateral rotation of the affected hip,<sup>46,47</sup> and then reduce the asymmetry in the range of hip rotation, which subsequently contribute to the relief of low back pain.<sup>48,49</sup>

## CONCLUSION

In patients who have back and lower extremity pain, a systematic patient history and a comprehensive physical examination are necessary to identify the principal cause of pain. Investigations can be used to supplement the diagnosis but must not be the only thing to be kept in mind while treating a patient. Clinical evaluation must be given prime importance to reduce the likelihood of misdiagnosis and unnecessary treatment.

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