



## Should a Lumbar MRI for back pain routinely include the sacro-iliac joint ?

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Back pain is a common problem and has been shown to affect approximately 85% of the adult population at any one time. The source of this pain can be difficult to identify and the sacroiliac joint (SIJ) has been proposed as a possible pain source. Its percentage contribution to lower back pain is controversial. Clinical provocative tests for SIJ pathology have been developed but these have high intra and inter-observer variability and the significance of positive findings is unclear. This study proposes that the SIJ should not be imaged as part of a routine MRI lumbar spine series.

**Method :** We retrospectively reviewed the images of 353 patients who had MRI lumbar spine scans. 130 had the SIJ imaged. We recorded the clinical findings and diagnosis at referral. We reviewed the images and documented the radiological findings.

**Results :** SI joint pathology was most frequently identified when clinical suspected. Overall SIJ pathology found on MRI in only 0.02% of patients.

**Conclusion :** We conclude that routinely imaging the SIJ in MRI lumbar spine series is not cost-effective or a useful use of resources. The SIJ should be imaged only if significant clinical findings are demonstrated.

**Keywords :** back pain ; sacroiliac joint ; MRI.

### INTRODUCTION

Lumbar back pain is a common problem and evidence has shown that approximately 85% of adults will experience an episode of back pain during their life (18). Pain in the lower back can originate from a

number of sources. The SIJ as a source of pain for patients with mechanical low back pain is controversial. However, some estimate that the SIJ is the source of back pain in around 16% of cases (15). One study has suggested the correlation between mechanical back pain and SIJ disorders to be between 13%-30%, based on relief from SIJ injections (14). The SIJ as a source of pain has been seen to increase to 20-80% during pregnancy (9). It can be difficult to differentiate whether the pain is from the lumbar spine region or the SIJ (11). This raises the question should routine MRI scans for back pain include the SIJ ?

The SIJ is a diarthrodial joint and has a large variation in the levels of origin of nociceptors, with

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a range from L2-S2 having been noted (16). A large number of patients are diagnosed as having SIJ dysfunction. This diagnosis covers a range of terms related to hypomobility and malalignment of the joint (13).

Numerous clinical tests exist to help in the diagnosis of SIJ dysfunction. These clinical tests can be divided into provocative tests and palpation tests. Provocative tests such as the FABER, POSH or Gillet test are available to be used. Combinations of these tests have been found to be more sensitive than using isolated tests (3,4). Szadek showed in their review article that a thigh thrust test, the compression test and 3 or more positive stressing tests had a discriminative power for diagnosing SI joint pain but they should be interpreted with care (17).

Various radiological tests are used in the diagnosis of SIJ pathology. Matthews *et al.* (10) performed a study looking at the use of plain radiographs to diagnose SIJ pathology. They found that they had a low yield of pathology, with a diagnosis of ankylosing spondylitis (AS) in only 2 of 392 patients. They concluded that the SIJ should only be imaged when clinically suspicious of AS. Davis *et al.* (5) used bone scans to diagnose SIJ pathology. They found that the mean uptake of radionuclide at the SIJ was significantly increased in patients who were complaining of low backache compared to an asymptomatic population. They found that 20 patients with abnormal bone scans had normal radiographs. Heuft-Dorenbosch *et al.* (8) showed that MRI was more sensitive than plain films in the diagnosis of SIJ pathology. They found that they had good rates of inter-observer reliability and demonstrated inflammation of the SIJ in a third of the scans and structural changes in a sixth. Battafarano *et al.* also showed MRI scan to be most accurate in the diagnosis of active SIJ inflammation when compared to CT and quantitative bone scan (1). The downside of including the SIJ in routine MRI imaging of the lumbar spine is it prolongs the time for the scan because of the additional sequences.

The purpose of this study was to see if the standard MRI of the lumbar spine should routinely include the SIJ. Our null hypothesis is that the SIJ may be the cause of pain in a significant proportion

of patients and MRI imaging should routinely include the SIJ.

## METHOD

We performed a retrospective review of 353 consecutive MRI lumbar spines and recorded the clinical findings and differential diagnosis at time of referral.

The MRI imaging and reports were reviewed. The axial imaging of the lumbar-sacral junction was reviewed to see if any SIJ pathology could be identified. The MRI scans were reviewed by two of the senior authors (SA and KL). Correlation was made between clinical suspicion of SIJ pathology and MRI findings.

## RESULTS

We reviewed the scans of 353 patients. The average age of the patients was 41.2 years (33-54). 130 had the SIJ imaged. The most common pathology identified in the SIJ was ankylosing spondylitis. Pathology in the SIJ was present in 9% of the scans. Pathology seen was oedema, osteophytes and sclerosis.

Of those that had the SIJ imaged it was requested by the reviewer in 43 cases. This yielded pathology in 18% of the scans. The remaining images revealed pathology in 4 scans giving a positive yield of 4%.

## DISCUSSION

The SIJ is a controversial source of low back pain (2). Some believe that it is a source of significant back pain whilst others are dismissive of it (7,11). Our study shows that the incidence of SIJ pathology on MRI pain is greatest when clinically suspected. The yield is significantly lower if routinely included in MRI of the lumbar spine for non-specific low back pain. This shows that a thorough history with appropriate examination is the appropriate way to guide imaging of the SIJ.

Dreyfuss *et al.* (6) showed that the range of clinical tests available for diagnosis of SIJ pathology were not validated and had high rates of intra-observer error. Whilst there were a large number of patients who did not have SIJ pathology in the our study the positive prediction was best in those who were clinically suspected of having SIJ pathology,

suggesting that clinical examination remains very important for the diagnosis of SIJ dysfunction. Due to the variation of sensitivity and specificity of the special tests for SIJ dysfunction we would advocate using a combination of the special tests to aid in diagnosis. We accept that we have not looked at specific tests for the confirmation of SIJ pathology but the SIJ was imaged on strong clinical suspicion in 43 patients. This would be an area of potential research. A study by Young *et al.* showed that SIJ pain had a positive relationship when positive on three or more provocation tests and pain when rising from sitting, if it was unilateral and absence of lumbar pain (19). This would concur with the results of our study would show that history and clinical findings have the highest rate of detection of SIJ pathology.

We found that in our series the majority of patients with positive pathology on MRI scan were male with an average age of 41.2 years. This correlates with previous studies which have looked at SIJ dysfunction (12). No specific enquiry was made in the female population about whether the pain was related to pregnancy or not. It is known that the female population have a tendency to develop worsening pain in the SIJ during pregnancy and pelvic diastasis can occur during labour. Some studies have shown that this can lead to persistent discomfort post-partum. Some previous studies have shown that injections into the SIJ have eased the pain the patient felt despite normal radiological studies (14). This raises the possibility of a non-structural source for the pain in these patients.

We also did not look at other imaging modalities for comparison in this study. Based on previous studies we felt that MRI scan had the highest sensitivity for diagnosis of both lumbar spinal pathology and SIJ.

There are limitations of this study as it is a retrospective review. To avoid bias, we reviewed consecutive MRI scans of patients referred with mechanical back pain. As it was retrospective review we were unable to document the precise provocative and palpation tests used for clinical evaluation. We cannot comment on the benefit of individual provocative clinical examinations. There was however a strong correlation between a strong clinical

suspicion of SIJ pathology and MRI findings in the SIJ.

## CONCLUSION

Our study shows that the positive MRI yield in clinically suspected SIJ pathology remains low. We would advocate that the SIJ is only imaged when there is strong clinical suspicion and not as part of a routine MRI lumbar spine as it is not cost-effective and does not influence patient management.

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