

Thermographic assessment of sacroiliac syndrome: report of a case

Peter RP Diakow, BSc, DC, FCCS(C)*

The thermographic appearance of a clinically diagnosed case of sacroiliac (SI) syndrome is presented. A diffuse area of increased thermal emission was imaged over the anatomical location of the joint. This pattern is similar to the thermal image seen in rheumatological patients with gross sacroiliitis. The thermal image returned to normal (thermal symmetry between SI joints) after a course of manipulation to the dysfunctional joint. Suggestions for future study are given.

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KEY WORDS: sacroiliac syndrome, thermography, manipulation, chiropractic.

L'apparence thermographique d'un cas de syndrome sacro-iléaïque (SI) diagnostiqué cliniquement, est présentée. Une région diffuse d'augmentation d'émission thermique fut observée à la location anatomique de l'articulation. Cette présentation est similaire à l'image thermique observée chez les patients souffrant de rhumatisme avec une forte sacro-iléite. L'image thermique est revenue à la normale (symétrie thermique entre les articulations SI) après une série de manipulations de l'articulation dysfonctionnelle. Des suggestions pour études futures sont apportées.

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MOTS CLES: syndrome sacro-iléaïque, thermographie, manipulation, chiropratique.

Introduction

The normal thermographic appearance of the area overlying the spine and pelvis has been well established.^{1,2} In the healthy asymptomatic subject, a thin stripe of increased thermal emission appears directly over the spinous processes and tapers to a point at the lumbosacral junction. Laterally, heat emission normally decreases rapidly but uniformly towards the flanks. Left-right thermal symmetry is expected except in the grossly obese.

Deviations in left/right symmetry from this pattern of even 0.3 degrees Centigrade are considered abnormal and suggestive of myofascial or nerve root irritation.^{3,4} Several reports have described the focal areas or linear streaks of hyperthermia appearing just lateral to the spinous processes in subjects with facet syndromes or disc herniations.^{5,6} These abnormal patterns, when correlated with thermal asymmetry in the lower limbs, may be a noninvasive, objective adjunct in the diagnosis of low-back disorders. Recent studies have found a high correlation with other standard orthopaedic investigations such as CT scanning and myelography.^{7,8}

Recently, Jacobsson and Vesteraskold described thermal patterns over the sacroiliac (SI) joints of both healthy volunteers and subjects with clinically and radiologically active joint inflammation.⁹ The inflamed joints showed an expanded area of increased heat emission which covered the anatomical location

of the joint itself. This pattern was similar to the previous descriptions of thermal images in subjects with ankylosing spondylitis.¹⁰ Joints without gross inflammation did not show increased emission.

It is interesting to note that Jacobsson and Vesteraskold indicate that thin, asymptomatic subjects often showed small focal hot spots over the upper portions of the SI joints.⁹ Wexler states that such focal emission, which may appear unilaterally, is not clinically significant but this concept is still controversial.¹¹ Such focal heat may be associated with joint dysfunction, without gross inflammation of the underlying joint. Joint dysfunction is rarely mentioned in the medical thermographic literature and it is likely that it is often overlooked within the "normal" groups during a study.

The case presented is an example of the thermographic imaging of a sacroiliac syndrome without gross rheumatological involvement.

Case report

A 47-year-old male was referred for a thermographic evaluation of low-back pain which had apparently originated from a motor vehicle accident six months previously. He described his pain as dull in character (becoming sharp upon aggravation) and located across the lumbosacral area with radiation into the left buttock. This pain was aggravated by bending, prolonged sitting and climbing stairs. He had had some relief from rest and medication.

On physical examination, the gross range of lumbar movement was painfully restricted by 40% in flexion, 70% in extension.

* Address correspondence to: Dr P Diakow, 10 Court Street, St. Catharines, Ontario L2R 4R4.

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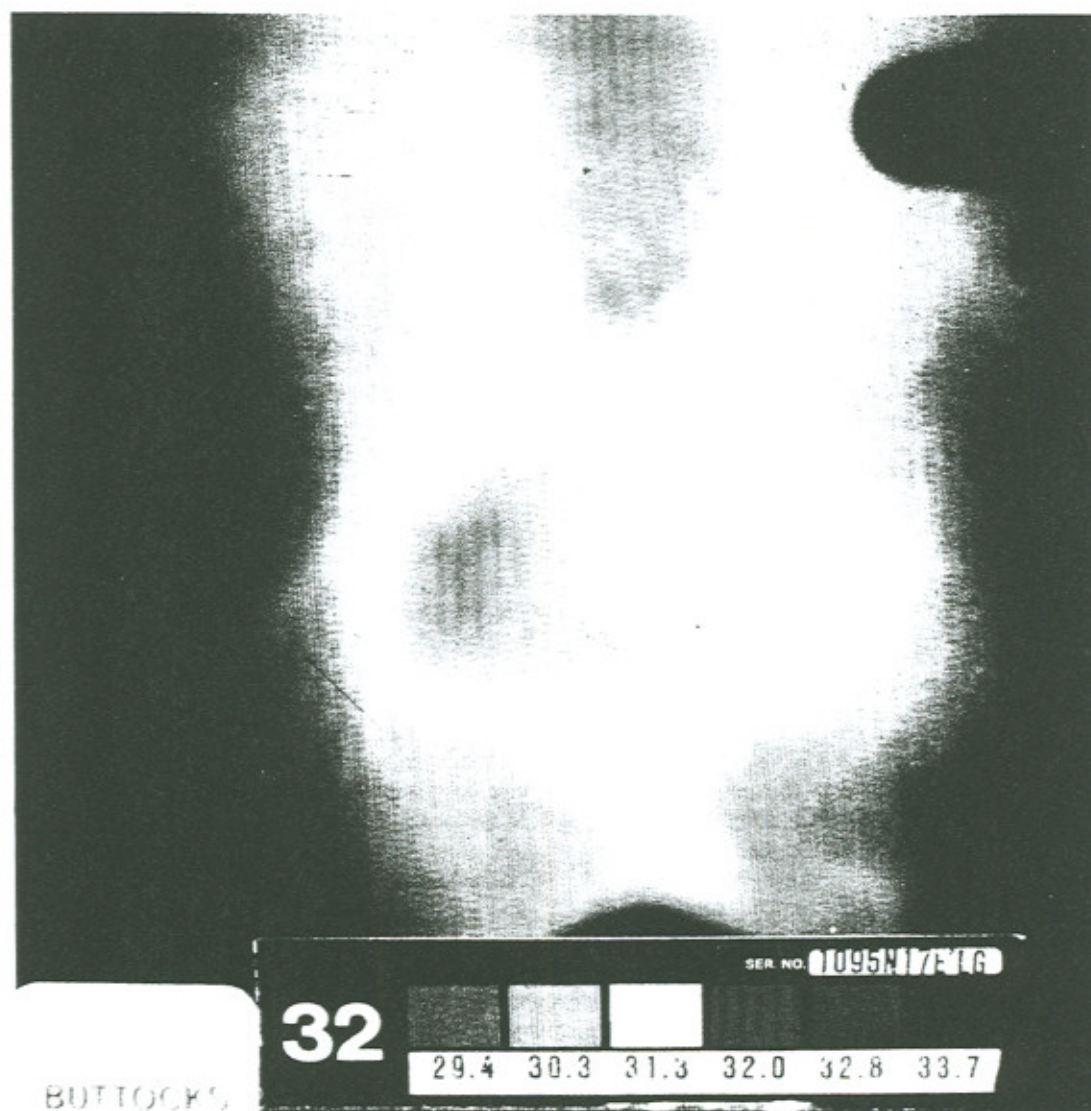


Figure 1 This is a buttock thermogram of the patient in the case report at the time of initial consultation, when he complained of left sided SI pain.

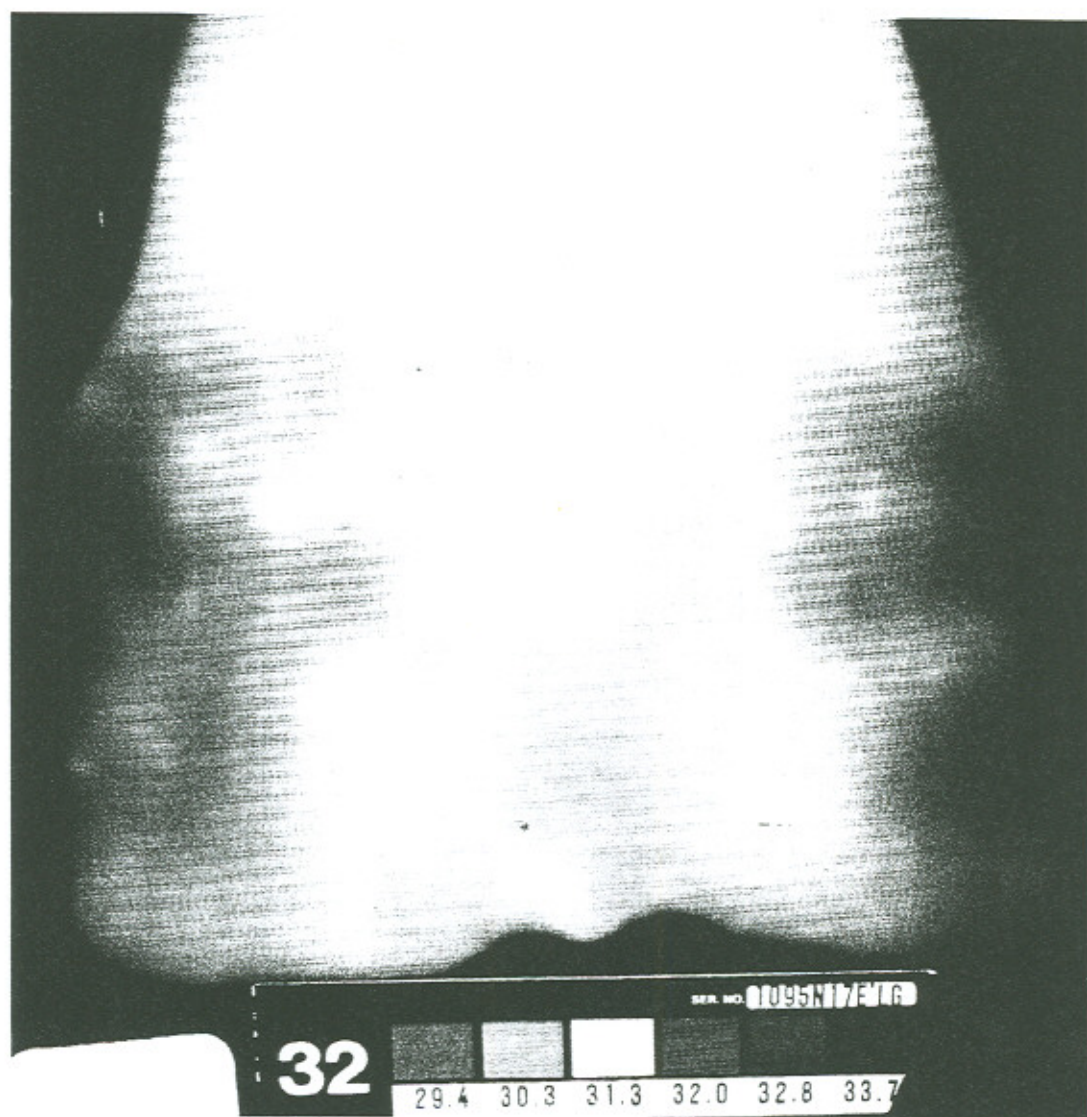


Figure 2 This is a buttock thermogram of the same patient, five weeks later after the resolution of his symptoms.

sion, 20% in lateral bending to either side and was painful at the extremes of both right and left rotation. The pain was localized to the left SI joint. Straight-leg raising was 90 degrees on the right but limited to 75 degrees on the left by hamstring tension. There were no signs of nerve root tension or neurological deficit in either lower limb. On palpation, there was tenderness and lack of mobility of the left SI joint. No gluteal trigger points were found. There was no history or physical evidence of a rheumatological condition.

The diagnosis was left sacroiliac syndrome.

A full lower body thermographic examination, using liquid crystal thermographic equipment, was conducted conforming to standard protocols which have been published elsewhere.¹² Figure 1 shows a buttock view from this thermographic series. Note the diffuse increase in thermal emission (more green) located over the anatomical location of the left SI joint.

This man underwent a course of daily (five per week) manipulation to the left SI joint with home application of ice for a three week period. There was improvement in symptoms beginning in the second week, with complete resolution of low-back pain by the fourth week. A second thermographic examination of the low-back was conducted approximately five weeks after presentation. Figure 2 shows a thermogram of the same man's buttocks from this second examination. Note that there is thermal symmetry between SI joints.

Discussion

This case illustrates the thermographic appearance of an uncomplicated sacroiliac syndrome. The diffuse increase in thermal emission over the left SI joint as evident in Figure 1, is similar to the image described for cases of gross joint inflammation.⁹ The temperature difference between the left and right joints in this example was 0.8 degrees Centigrade. The hot spot also covered almost two-thirds of the estimated anatomical size of the joint. In this respect, the thermal image was not related to the focal hot spots described by Wexler in his normal subjects, or to the normal pattern associated with very thin individuals.^{9,11}

The thermal appearance of the joint changed in response to the treatment of the SI syndrome. Figure 2 shows thermal symmetry between SI joints at a time when the patient was asymptomatic and the joint function was palpated as normal. It has been established by several studies that thermal patterns remain constant over months and sometimes years as long as therapeutic intervention has not occurred.¹³ It is therefore likely, that differences between the first and second thermal studies are due to the presence and subsequent resolution of the joint dysfunction, rather than to normal variation over time.

What is needed at this time to establish the diagnostic value of this pattern, is a comparison of thermal images from samples of patients with and without sacroiliac syndrome. A "thermal index" may be established incorporating both the intensity of heat emission as well as the size of a hot spot appearing over the joint. In this way, an expanded area of hyperthermia such as

found in this case study, would score high (indicating the presence of SI syndrome); whereas thermal symmetry or even focal areas of increased heat, would score low (indicating "normal" or functional SI joints).

This example does not answer the question of thermographic imaging of the SI joints in the asymptomatic population. Whether thermal asymmetry in the form of small focal emission over only one joint represents joint dysfunction without overt symptoms is not known at this time. It would be useful to thermograph an asymptomatic sample and blindly palpate for the presence of SI dysfunction. The dysfunctional joints could then be correlated with the presence of these focal hot spots.

Conclusions

A case report of thermal imaging of the sacroiliac syndrome is presented. The thermal image associated with this syndrome closely resembles that of gross joint inflammation found in rheumatological conditions. The thermal pattern returned to normal after therapeutic intervention with a course of manipulation. Suggestions for future study are made.

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