0008-3194/96/145–149/$2.00/©JCCA 1996

Spinal manipulation in a case of sacral fracture: presentation in a chiropractic office

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A case is presented involving the successful management of symptoms following a sacral fracture. Treatment was primarily comprised of sacroiliac joint manipulation. The importance of accurate diagnosis, realistic risk/benefit assessment, and appropriate treatment is emphasized in considering contraindications of spinal manipulative therapy.
(JCCA 1996; 40(3):145–149)

KEY WORDS: chiropractic, fracture, manipulation, contraindication.

Il s'agit d'un cas relatant le traitement réussi des symptômes reliés à une fracture sacrale. Le traitement reposait essentiellement sur des manipulations de l'articulation sacro-iliaque. L'importance d'un diagnostic précis, d'une évaluation réaliste des risques/bénéfices et d'un traitement adapté est mise en relief, compte tenu des contre-indications d'un traitement basé sur des manipulations vertébrales.
(JCCA 1996; 40(3):145–149)

MOTS CLÉS : chiropratique, fracture, manipulation, contre-indications.

Introduction

An osseous fracture is considered a contraindication to local spinal manipulative therapy (SMT).[1] However, the forces required to fracture normal bone may well affect contiguous articular and soft tissue structures. Thus, the clinician must be able to differentially diagnose the sources of symptoms when a patient presents with osseous fracture, and be able to ascertain the etiology of the fracture. The following case demonstrates the importance of *not* assuming that all presenting symptomatology is caused by a detected fracture. Implementing the most appropriate plan of management requires accurate diagnosis and consideration of risk versus benefit for the patient.

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Case study

A 49-year-old male orderly, successfully treated by a chiropractor for dynamic lateral left S1 nerve root entrapment in the past, presented to a chiropractor with acute, nonradiating lower sacral and right buttock pain. The pain was aggravated by sitting or sudden movement, and was relieved with recumbency. The pain began two days previously, after he fell onto his buttocks when the chain of the swing he was sitting on broke. X-rays revealed an oblique (zone III)[2] fracture through the fifth sacral segment with slight anterior displacement of the distal fragment (Figure 1).

Neurological examination was unremarkable. On orthopaedic examination, the buttock pain was elicited by stressing the sacroiliac (SI) joints, but the distal sacral pain was not aggravated. Patrick's (FABER or Figure 4) test was negative.

Palpation revealed marked tenderness of the distal sacrum. Both SI joints were tender and hypomobile. Palpation of the lumbosacral and gluteal musculature did not recreate the patient's symptoms.

The buttock pain was diagnosed as being due to post-traumatic SI syndrome. The fracture accounted for the

Figure 1A AP radiograph of the sacrum. The fracture line is not readily apparent (arrowhead).

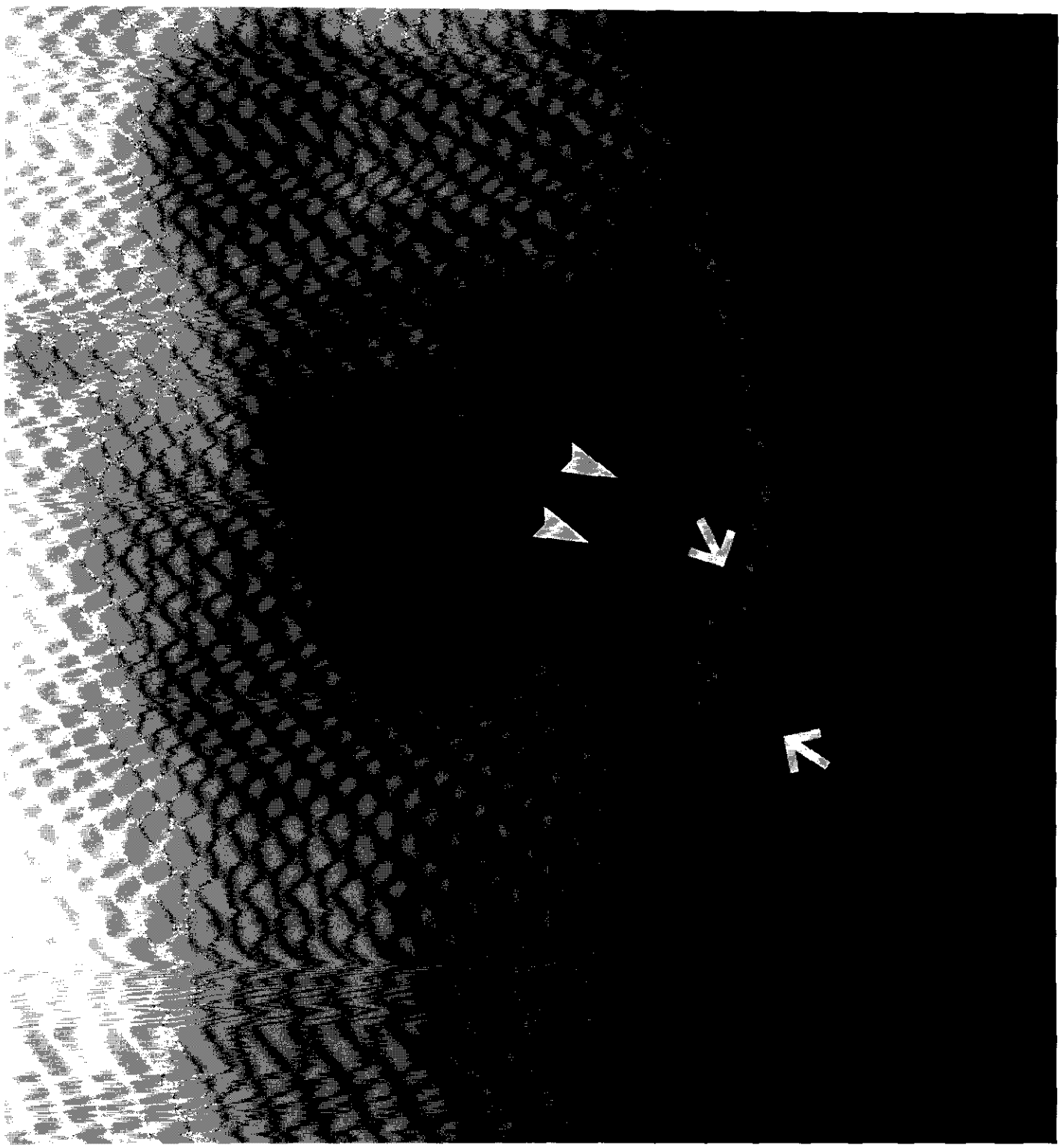

Figure 1B Lateral view of the sacrum. Note the widened presacral space (arrowhead) and anteriorly displaced distal fragment of the fracture through S5 (arrow).

distal sacral tenderness. After obtaining the patient's informed consent, the SI joints were manipulated with the patient in side-posture, once on each side, with a contact over the proximal SI joint. Interferential current was applied over the sacrum for analgesia. The patient felt markedly improved immediately.

At the fourth daily treatment of SI adjustment (at times with electrotherapy), the patient reported experiencing right buttock pain only at the end of the day, when arising from sitting. He was prescribed back and hip stretching and abdominal strengthening exercises, as well as a SI support (trochanteric) belt in preparation for resumption of the long, physically demanding shift work that day.

His progress was followed through five subsequent treatments during the following two weeks. He was discharged from further treatment with recurrences of mild, self-limiting lower back ache after prolonged sitting. Two months later he presented with localized low back pain caused by transferring a patient at work. He discharged himself from further treatment when he was again asymptomatic after five treatments over the course of ten days.

Discussion

Sacral fractures are not rare. Since they give rise to nonpathognomonic low back or buttock pain and are often difficult to visualize on plain radiographs, cases of insufficiency, pathologic[3,4] or fatigue[5] fractures of the sacrum may be underdiagnosed. In the absence of obvious fracture lines or fragments, the only indication of the presence of sacral fracture on plain films may be an increased presacral space on the lateral view of the sacrum.[6] Computerized tomography reveals fractures in the sagittal plane, but may be less effective in revealing horizontal sacral fractures.[3] Radionuclide bone scans are sensitive in signalling the probability that a fracture is present in the sacrum, but they are not specific for fractures and cannot image them.

Sacral fracture is more likely to be suspected from the history and symptomatology of a patient whose pelvic region has been grossly traumatized (e.g., fall or jump from excessive height, motorcycle accidents, pedestrian struck by a vehicle). Denis et al.[2] categorized fractures by their location as either Zone I (vertically oriented, lateral to the sacral foramina), Zone II (vertically oriented, through the foraminal region) or Zone III (horizontally oriented, traversing the central sacral canal). They determined that Zone I fractures could lead to entrapment of the L5 or sciatic nerve between the L5 transverse process and the sacral alar fragment if the sacral fracture allowed the ala to be pulled superiorly by the unopposed contraction of the attached paralumbar musculature. The S1 and S2 nerve roots, as well as the L5 or sciatic nerve, were predisposed to compromise by Zone II fractures. Zone III fractures were most frequently found in people who had fallen, and were most likely to result in neuropathic bowel, bladder or sexual dysfunction, with or without L5, S1 or S2 radiculopathy. Unfortunately, Denis et al.[2] did not indicate at which sacral segments the horizontal fractures occurred in their cases.

The only neural structures descending across the fifth sacral segment are the fifth sacral and (first) coccygeal nerve roots. If they were lesioned, the most likely consequence would be anesthesia and/or neuralgia of the coccygeal region.

Bed rest and analgesics is the treatment for stable sacral fractures.[2,3,4] Ambulation (with crutches at first) is encouraged as soon as possible as it is unlikely to disrupt healing. Thus, weight-bearing may resume earlier in a stable horizontal sacral fracture, since callus formation would not be disrupted, as opposed to vertical sacral fractures. Even motor deficits of sphincters and of the lower extremity have resolved with bed rest alone in some cases.[2]

The diagnosis of SI syndrome, based upon history and physical examination, can account for symptoms in the low back, pelvic girdle and lower extremity. Diagnostic confusion is common because the SI joint receives innervation from as many levels as L2–S4,[8] resulting in a variety of local and referred pain patterns arising from SI dysfunction or pathology. The SI joint is stabilized by a series of strong ligaments.

Every therapeutic intervention requires an indication for its implementation in the absence of contraindication. In this case, orthopaedic and palpatory examinations pointed to mechanical SI joint dysfunction as the source of the patient's buttock pain. Thus, solely on the basis of these findings, SI adjustment was indicated.[8]

Radiographic and palpatory examinations suggested that the sacral fracture was the source of the distal sacral tenderness and generally contraindicated regional manipulation. However, based on the unremarkable neurological examination, unrestricted gross ranges of hip and

spinal motion, the minimal displacement of the most distal segment of the fractured sacrum, and the experienced chiropractor's confidence that he could deliver a specific, local adjustive thrust which was unlikely to affect the fractured portion of the sacrum in this case, the presence of the fracture alone was dismissed as a contraindication to side-posture SI adjustment with a contact over the proximal SI joint. This consideration was supported by the patient's report of comfort on pre-manipulative positioning.

To obtain proper informed consent, the health care provider and the patient must be cognizant of the expected risks and benefits of the proposed treatment. In this case, the potential risks of treatment for the patient could basically be considered as impaired fracture healing and neurological compromise.

If the manipulation disrupted the fracture healing process, the potential sequelae would include chronic sacral pain and attendant disability (e.g., reduced tolerance for sitting). Neurologically, the nerves that could be compromised by manipulative disturbance of the fracture segment would potentially include the S4, S5 and coccygeal nerve roots, which in turn could result in perianal pain and/or aberrant sensation. As explained previously, the likelihood of these sequelae occurring was considered to be low, and their consequent morbidity relatively non-incapacitating.

The potential benefits of the treatment under consideration included quicker resolution of the buttock pain and its accompanying disability, thus permitting a more rapid return to normal activities of daily living and (of significance to the patient) work. The alternative to manipulative therapy – rest, with or without electrotherapeutic or medicinal analgesic therapy – would likely delay resumption of normal activity levels, and possibly contribute to secondary morbidity in the form of musculoskeletal deconditioning.[9,10] Thus, the manipulative treatment was agreed upon. The patient's immediate response to the first treatment was considered justification for continued treatment, with complete resolution of symptoms the expected outcome.

The delineation between relative versus absolute contraindications may not always be clearly distinguished. For example, pathologic weakening of bone (e.g., advanced osteoporosis, Paget's disease, metastatic bone disease) is an absolute contraindication when the forces of manipulation are directed to the involved bone. The more distant the compromised osseous structure is from the treated area, the more relative is the contraindication. In this case, it became apparent that the fracture posed a relative contraindication to manipulation and further clinical reckoning ruled out contraindication.

Conclusion

The authors do not advocate routine manipulation of fractured bone and do not imply that manipulation heals osseous fractures. Extreme caution must be exercised in any condition involving fracture and/or dislocation. This case demonstrates that fracture is not always an absolute contraindication for spinal adjustive treatment. In this case the fracture was stable and distal to the joint treated. Accurate diagnosis, based upon thorough clinical assessment, and knowledge of the capabilities and limitations of the treatment, based upon practical experience, are paramount in determining the appropriateness of any intervention considered.

References

1 Henderson D, Chapman-Smith D, Mior S, Vernon H, eds. Clinical guidelines for chiropractic practice in Canada. J Can Chiropr Assoc (Suppl) 1994; 38(3):137–147.

2 Denis F, Davis S, Comfort T. Sacral fractures: an important problem. Retrospective analysis of 235 cases. Clin Orthop 1988; 227:67–81.

3 Leroux JL, Denat B, Thomas E, Blotman F, Bonnel F. Sacral insufficiency fractures presenting as acute low back pain. Biomechanical aspects. Spine 1993; 18:2502–2506.

4 Weber M, Hasler P, Gerber H. Insufficiency fractures of the sacrum. Twenty cases and review of the literature. Spine 1993; 18:2507–2512.

5 Grier D, Wardell S, Sarwark J, Poznanski AK. Fatigue fractures of the sacrum in children: two case reports and a review of the literature. Skeletal Radiol 1993; 22:515–518.

6 Yochum TR, Rowe LJ. Essentials of skeletal radiology. Baltimore: Williams & Wilkins, 1987: 203.

7 Chusid JG. Correlative neuroanatomy and functional neurology. 17th ed. Los Altos, CA: Lange Medical Publications, 1979: 138.

8 Cassidy JD, Mierau DR. Pathophysiology of the sacroiliac joint. In: Haldeman S, ed. Principles & practice of chiropractic, 2nd ed. East Norwalk, CT: Appleton & Lange, 1992: 211–224.

9 Deyo RA. Non-operative treatment of low back disorders. Differentiating useful from useless therapy. In: Frymoyer JW, ed. The adult spine: principles & practice. New York: Raven Press, Ltd. 1991: 567–580.

10 Bortz WM. The disuse syndrome. West J Med 1984; 141:691–694.