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CASE REPORTS

Chiropractic/Dental Cotreatment of Lumbosacral Pain with Temporomandibular Joint Involvement

Albert S. Chinappi, Jr., D.D.S. and Harvey Getzoff, D.C.†*

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ABSTRACT

Objective: To demonstrate the concept of integrated dental orthopedic and cranio-chiropractic care for treating structural disorders of the jaw, neck and spine.

Clinical Features: A 33-yr-old woman sought chiropractic care for centralized lumbosacral pain that had persisted for 3 months. She exhibited pain on lumbopelvic extension and marked limitations on lumbopelvic flexion. In addition, cervical rotation and cranial sutural motion in the right malar maxillary suture were restricted. The left temporal mandibular joint also was limited in translation. Based on initial chiropractic sacro-occipital technique, she was diagnosed with Category III lumbopelvic dysfunction. X-ray examination revealed a lumbosacral angle of 39°, with sacral displacement posterior to the weight-bearing line. In conjunction with the beginning of chiropractic care, she was encouraged to seek dental-orthodontic evaluation. After 30 months of chiropractic treatment, she was still experiencing some lower back pain and limited improvement. She finally agreed to see the orthodontist. Orthodontic evaluation revealed a Class II malocclusion with significant loss of vertical dimension, characteristic of bilateral posterior bite collapse.

Intervention and Outcome: Initial orthodontic treatment began in September 1991 and was followed by restorative dentistry to replace the missing teeth. This cotreatment approach, which integrated dental orthopedic and craniochiropractic care, ameliorated the pain and improved head, jaw, neck and back function.

Conclusion: The position of the jaw, head and vertebral column, including the lumbar region, are intricately linked. Orthodontic treatment improved the position of the mandible, which in turn enabled the body to respond to chiropractic care. (J Manipulative Physiol Ther 1996; 19:607–12).

Key Indexing Terms: Temporomandibular Joint Syndrome, Chiropractic, Orthodontics, Lumbar Vertebrae.

INTRODUCTION

In two previous articles (1, 2), we discussed a model of integrated care based on chiropractic/dental cotreatment as an aid to improving overall function and health. The first article discussed the relationship of facial growth and development to the health and alignment of the spine and the rest of the body. The second article presented a case study of a patient who initially sought orthodontic treatment to straighten her teeth and then received chiropractic intervention to complete the process and improve her overall health and function. This article discusses a case in which the patient first sought chiropractic care and then used dentistry to successfully complete the process. Our goal is to demonstrate, by way of these examples, that integrated chiropractic/dental cotreatment can improve the outcome to a far greater extent than is possible within either discipline alone.

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CASE REPORT

In February of 1989, a 33-yr-old woman sought chiropractic care for consistent centralized lumbosacral pain that had persisted for 3 months. Chiropractic examination revealed pain on lumbopelvic extension and marked limitations on lumbopelvic flexion. The inferior spinous processes of L4 and L5 were tender to palpation. The lumbar musculature also was tender to palpation and spastic on the left. In addition, right cervical rotation was restricted to 70° (90° is normal); the left temporomandibular joint was limited in translation, and cranial sutural motion was restricted in the right malar maxillary suture (Table 1). Sutural restrictions are characterized by limited relative motion when pressure is applied to specific cranial sutural areas. The Step Out Toe Out (SOTO) test was positive for left iliofemoral restriction, with no pain in the left leg (Table 1). Sacro-occipital SOTO testing assesses the ability of the pelvis to react to leg abduction and external rotation. Asymmetrical differences are noted, along with any pain patterns such as sciatic nerve root pain.

The patient's lateral lumbopelvic X-ray revealed a lumbosacral angle of 39°, with sacral displacement posterior to the weight-bearing line. The apex of the sacrum was 3 inches from the weight-bearing line (Figure 1). The anteroposterior X-ray showed marked right rotation of the L1–L4 vertebral spinous processes. The patient was diagnosed as SOT Category III, characterized by lumbar subluxations (in this case, posterior

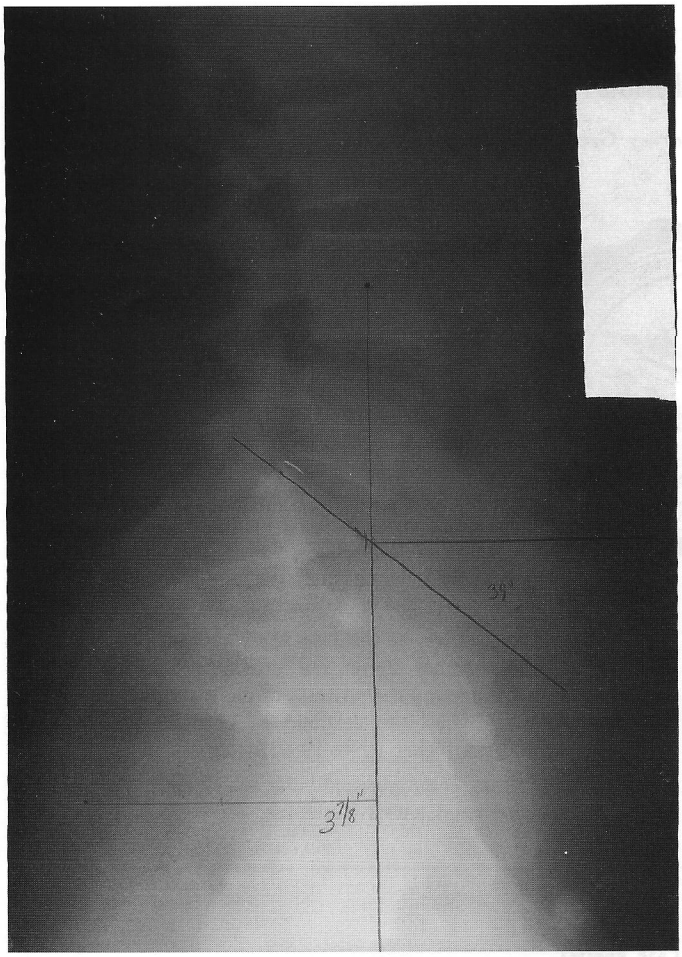

Fig. 1 *X-ray taken on February 23, 1989 that shows sacral displacement posterior to the weight-bearing line.*

compression of L5 on S1, with pelvic distortion patterns but with no sacroiliac interosseous ligament damage).

Chiropractic treatment consisted of SOT Category III blocking to reduce pelvic distortion. The indicator for pelvic improvement is improved response as SOTO testing is applied every 2 min, while the patient lies prone on the pelvic blocks. SOT disc technique, a procedure that guides the lumbar vertebrae into flexion then back to a neutral position with the patient sitting and assisting, was applied to L4 and L5. SOT "stairstep" and cervical "figure 8" adjustments were used to increase the cervical right rotation. The "stairstep" involves cervical translatory movements, whereas the "figure 8" involves cervical rotation and lateral range of motion compressive movements (1). In this case, cranial sutural adjustments consisted of applying pressure in a specific direction to create sutural motion in the right maxillary/malar area. Orthodontic evaluation was recommended in conjunction with chiropractic treatment.

The patient received a total of 33 adjustments in 1989: seven in March, six in April, and five each in May, June and July. From August through December, she received five more adjustments. In 1990, she received a total of 12 monthly adjustments, and in 1991, she received only six. During this time, she showed limited symptomatic improvement, as well as limited improvements in SOT findings (Table 1).

Based on her limited SOT progress and the fact that there was no improvement in the cranium or temporomandibular joint, she was further encouraged to seek orthodontic evaluation, to which she finally agreed.

Dental examination in September of 1991 revealed a Class II malocclusion with a narrow maxilla and resulting cross-bite tendency in the posterior bite (Figures 2 and 3). The Class II malocclusion is characterized by a posterior placement of the mandible in reference to the maxilla. The tendency to crossbite is a function of the relative widths of the maxilla to mandible. If the maxilla is insufficiently wide to accommodate the mandibular dentition, the maxillary teeth do not overlap properly and can cause the mandible to shift right or left to accommodate the bite. In addition, the patient had only a limited (32 mm) range of opening in the temporomandibular joints, undoubtedly because of posterior shifting of the mandible and loading on those joints.

The maxillary right and mandibular right and left first molars had been extracted when she was young (Figure 4), which produced significant loss of vertical dimension. Vertical dimension is a measure of the distance between the upper and lower dentitions. In this case, the vertical dimension was reduced, which is characteristic of posterior bite collapse. This situation develops when posterior teeth, often on the lower arch, are lost and not replaced. Over time, the teeth posterior to the missing teeth tip and migrate forward, reducing the vertical dimension (Figures 2A, 3A and 5). The primary goal in treating these conditions is to reverse the effects of the poor facial growth as well as the results of the lost dentition.

In this case, the major treatment steps were to enlarge and develop the maxilla to correct the crossbite, which allowed the mandible to reposition itself slightly downward and forward; return the teeth to their correct upright position for the bridgework (Figures 2B, 3B and 6), thereby increasing vertical dimension and reducing the stress on the temporomandibular joints; and, finally, to insert the bridgework. The orthodontic treatment spanned a period of approximately 2 yr, from September 1991 to the fall of 1993, at which time the restorative dentistry was completed.

On September 21, 1993, the patient was re-examined at the

Table 1. *Chiropractic findings*

	2/23/89	7/25/89
Cervical right rotation	70°	75°
Right maxillary/malar suture	Tender and restricted	Tender and restricted
Left temporomandibular joint	Restricted in translation	Restricted in translation
Palpation L4, L5 spinous processes	Tender	Tender
SOTO - Left Iliofemoral	Restriction	Improved
	Compared with right	Same as right

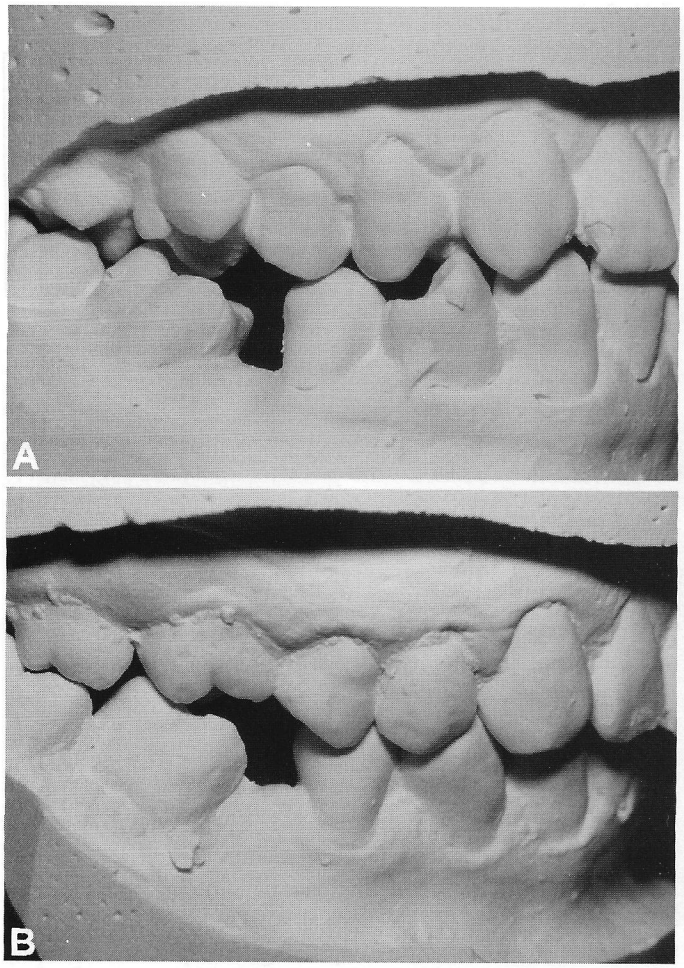

Fig. 2 ***A.*** *Pretreatment study model that shows molars tipped and migrating forward.* ***B.*** *Post-treatment study model that shows improved bite and vertical dimension.*

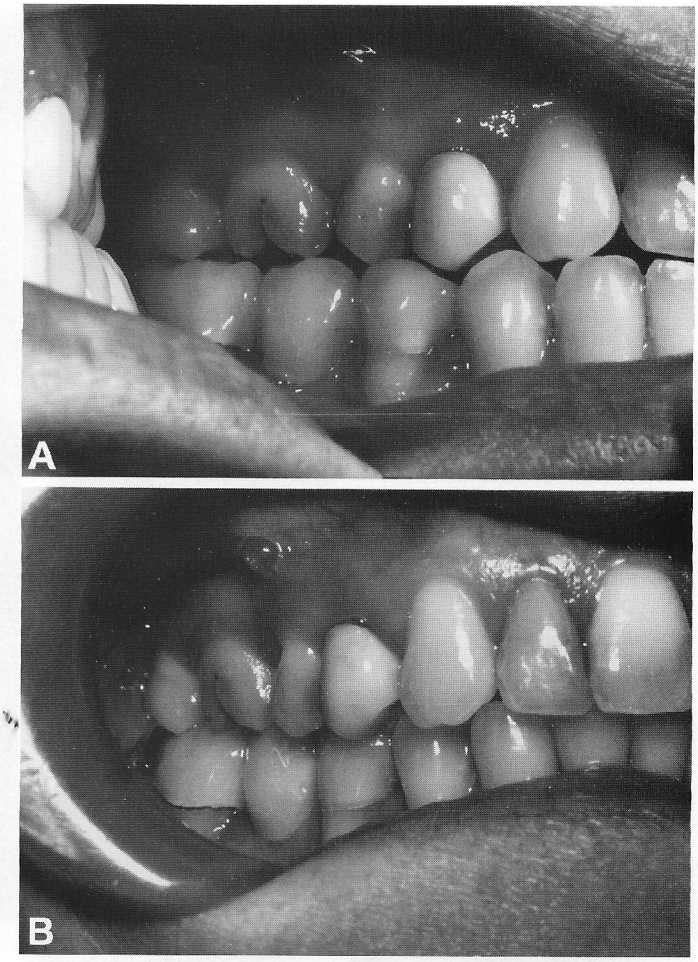

Fig. 3 ***A.*** *Pretreatment photo that shows posterior bite collapse.* ***B.*** *Post-treatment photo that shows improved bite support.*

chiropractic office (Table 2) and reported that she was no longer experiencing lower back pain. Throughout orthodontic treatment, improvement was noted in all areas, especially in the cranium and jaw. The X-ray findings also showed improved sacral positioning in relationship to the weight-bearing line (Table 3; Figures 1, 7 and 8).

DISCUSSION

The initial chiropractic treatment goal was to eliminate the Category III indicators:

- lumbar palpatory findings;
- SOTO ilio-femoral unilateral differences; and
- positioning of the anterior sacral base under the weight bearing line.

Because of their relationship to the lumbar spine, improvement in the cranium and the cervical ranges of motion were also identified as treatment goals.

We know that there are functional and anatomical relationships between the jaw, head and cervical spine, and as stated in our earlier papers, we know flexion of the head on the cervical

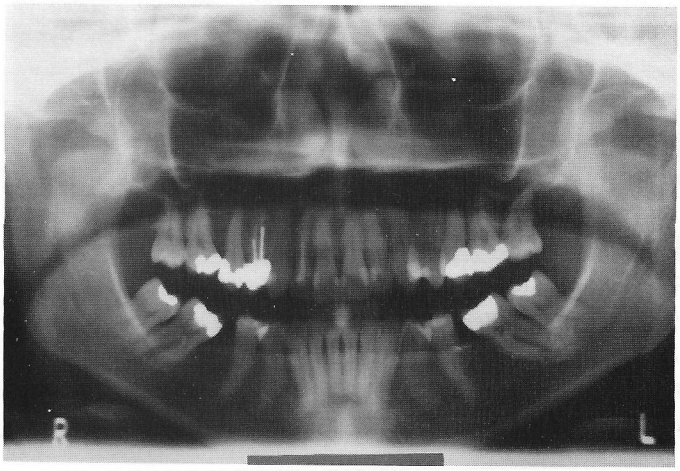

Fig. 4 *Pretreatment panoramic view. Note migration of molars.*

column and flexion of the neck on the thoracic column depend on the anterior muscles of the neck (1, 3, 4). Because these muscles are distant from the cervical column, they act as the long arm of a lever (5). When these muscles act simultaneously, the mandible is lowered. But if the mandible is fixed

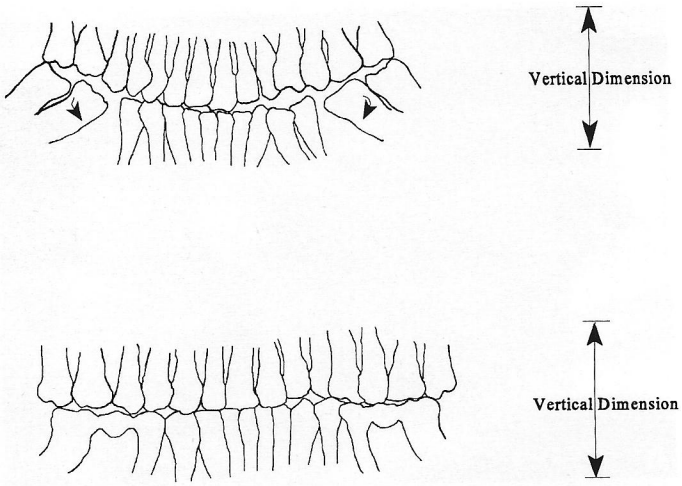

Fig. 5 *Bite before and after dental treatment. Vertical dimension increases with continuous interface of support along the arch.*

by contraction of the muscles of mastication (the masseter and the temporalis), then the suprahyoid and infrahyoid muscles produce flexion of the head on the cervical column and flexion of the cervical column on the thoracic column and simultaneously flatten the cervical curvature (6). Consequently, these muscle groups are very important in supporting the cervical column at rest (3, 5, 7).

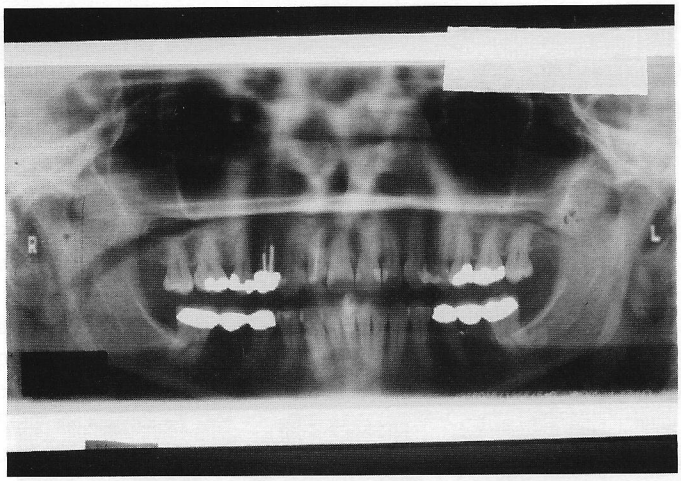

Fig. 6 *Post-treatment panoramic view that shows bridgework and improved bite posture.*

Table 3. *Lateral lumbopelvic X-rays*

	2/23/89	9/21/93	1/11/96
Sacral base angle	39°	39°	39°
Weight-bearing line	Anterior-to-anterior sacral apex	Passes through anterior sacral apex	Passes through anterior sacral apex
Sacral apex to weight-bearing line	3.875 inches	3.125 inches	3 inches

In a deep-bite malocclusion, the resulting occlusion is an outcome of poor facial growth in the craniofacial complex (1, 8). Poor early maxillary development prevents the mandible from reaching its correct position within the face (8). With the subsequent loss of teeth, there is an additional loss of posterior vertical support. As a result, the mandible is allowed to slip farther to the posterior (Figure 5). This can cause trauma to the temporomandibular joints and affect the inframandibular muscle system, which further compromises the relationship between the mandible and cervical spine.

The importance of dentistry in these situations should not be underestimated. The first step in the dental program (i.e., enlarging and developing the maxilla) creates a space in which the mandible may assume a more healthy position (1, 8, 9). This slow maxillary remodeling and mandibular self-posturing influence the health of the cervical musculature and temporomandibular joint, as well as improving head position (2, 3, 4, 10). In addition to unloading the temporomandibular joints, the positional change of the mandible creates the space for making upright and replacing the posterior teeth (Figures 5 and 6). It is at this point that the mandible can be properly supported through more continuous contact between upper and lower dentition (Figure 6). The increased posterior vertical dimension is also more consistent with healthy muscle tonus and length, which stabilizes the entire anterior cervical musculature.

We also know that the function of the cervical spine can impact function of the lumbar spine (11). Alterations of one of the functional curves will cause reciprocal alteration in the other curves (12). Although we tend to divide the spine into regions (cervical, thoracic and lumbar), this can be a mistake, because the three units are loosely interrelated both structurally

Table 2. *Chiropractic findings before and after treatment*

	2/23/89	7/25/89	9/21/93
Cervical right rotation	70°	75°	80°
Right maxillary/malar suture	Tender and restricted	Tender and restricted	No tenderness or restriction
Left temporomandibular joint	Restricted in translation	Restricted in translation	No restriction in translation
Palpation L4, L5 spinous process	Tender	Tender	No tenderness
SOTO - Left Iliofemoral	Restriction compared with right	Improved same as right	Symmetry maintained

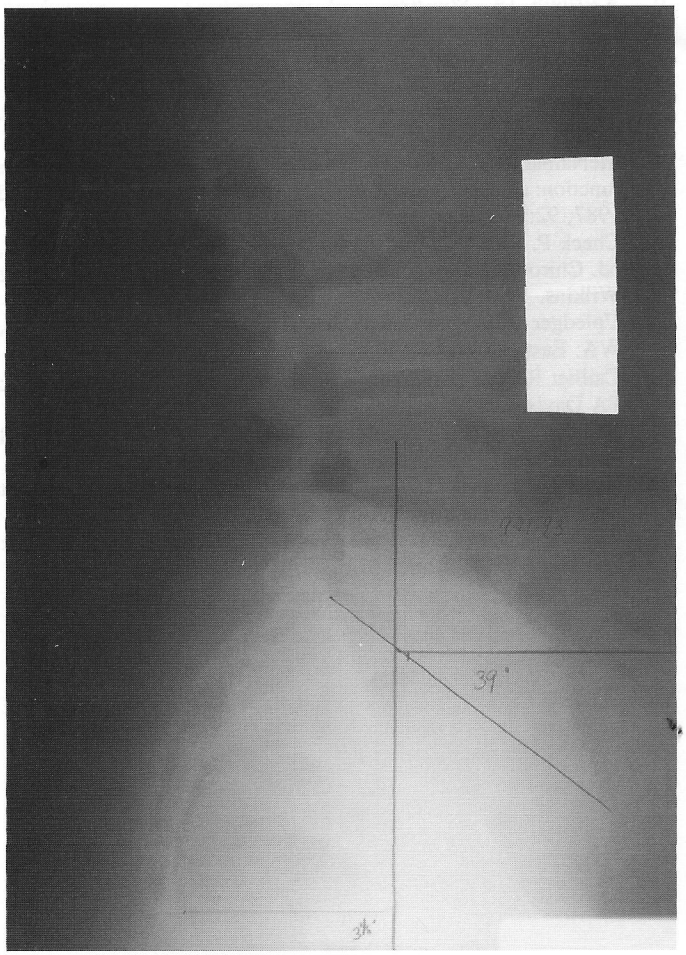

Fig. 7 *X-ray (September 21, 1993) that shows improvement in sacral displacement.*

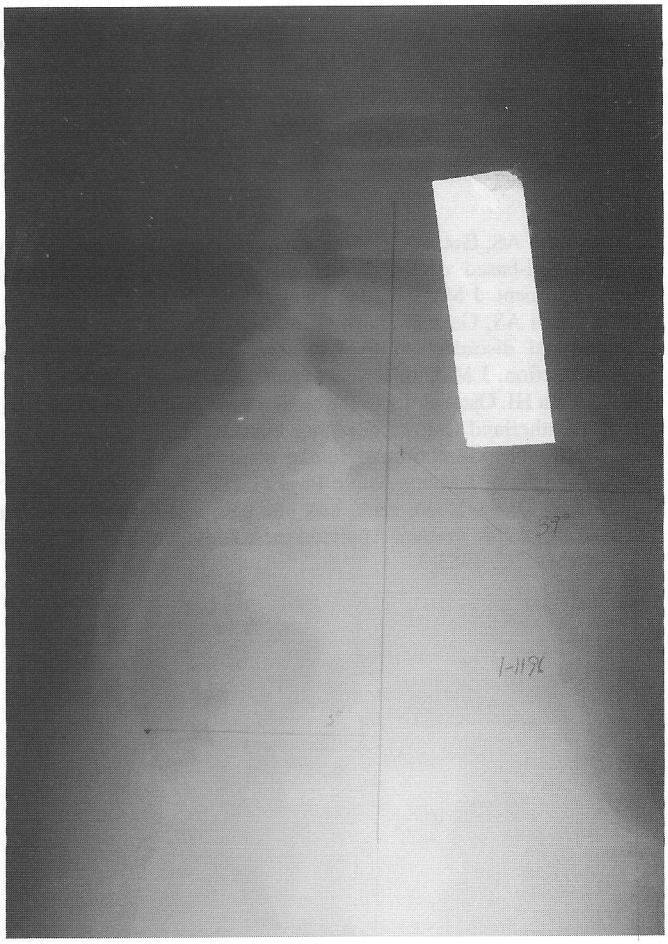

Fig. 8 *X-ray (January 11, 1996) that shows further improvement in sacral positioning.*

and functionally (13). Head position and posture can influence the lumbar spine; thus, the whole body must be considered a unit because none of its parts function independently. In a given situation, the underlying cause may be in the mouth, which projects its deleterious influences in a caudad direction (14).

According to Dr. Burl Pettibon, D.C.,

> We view the head as a vertebra. The head is the only vertebra that has neural tissue (the eyes), directing its position; therefore, it is the only vertebra that knows where it should be in three dimensional space. The head's position relative to gravity is maintained by five righting reflexes, especially those of the eyes. The righting reflexes have control over all of the other muscles of the spine; therefore, they control the position of all other vertebrae (15).

Orthodontic interventions facilitate head and neck postural positions, which may reduce the influences of the head and neck posture on the lumber spine.

In this case, the full benefit of chiropractic treatment was limited by head, jaw and neck posture. Once orthodontic therapy was completed and the teeth restored, there were significant positive changes in both the chiropractic physical testing and lumbar X-rays. It is even more encouraging that 28 months after completion of orthodontic treatment and with only limited chiropractic follow-up visits, these positive changes were maintained (Table 3; Figure 8).

CONCLUSION

This case supports the concept of integrated care, illustrating that chiropractic outcomes can be dependent on and even improved by orthodontic/dental intervention. It is possible that the patient would have followed a natural history of improvement; because 3 yr of chiropractic adjustments made no significant change and the dental temporomandibular joint problems were remarkable; however, we felt dental intervention was necessary.

The fact that there is a functional and anatomical relationship between the jaw, head and spine suggests advantages to taking a more holistic, integrated approach in many cases. To date, progress in this area has been greatly hampered by the different health-care professions' general lack of awareness of one another. Thus, the relationship between these two and related disciplines warrants further investigation. It is our hope that our writings will prompt an open dialogue between med-

ical practitioners with different specialties that ultimately will advance the concept of integrated care. Greater understanding and cooperation not only will benefit the health care providers but also, and more importantly, they will benefit the patient.

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