CASE REPORT: Management of Post-Surgical Low Back Syndrome with Upper Cervical Adjustment

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ABSTRACT

Management of a case of Post Surgical Low Back Syndrome is described. The condition, which had previously been unresponsive to medical treatment, responded favorably to specific upper cervical adjustments as determined by both subjective and objective outcome measuring standards.

INTRODUCTION

Following is a case study of a patient suffering from chronic low back pain 19 years after receiving a lower spine fusion operation. Postoperatively, this patient received relief from pain. From a statistical vantage, he is probably included as a low-back surgery success.

Failed back surgery syndrome (FBSS) is a group of disorders with persistent or recurrent symptoms following spinal surgery, with the hallmarks of back pain, sciatica, and functional impairment[1]. It is a serious problem, as worldwide failure rate of initial spinal surgery ranges from 25 - 40%. [1,2,3] This is a considerable risk, especially when the patient is young.

In cases where low back pain was relieved by spinal fusion, radiographic studies done prior to surgery demonstrated that there was obvious excessive motion of the vertebral segment(s) involved, or one spinal vertebra was progressively slipping out of alignment with the adjacent vertebra. Most fusions are done for painful spondylolisthesis, degenerative disc disease, backache following discectomy, and facet joint arthritis.[5]

CASE HISTORY

A 33-year old male presented to the Sid E. Williams Research Center on March 24th, 1992 with a chief complaint of severe, sharp perianal pain, low back pain, and bilateral posterior thigh pain extending down to the knees. The pain started suddenly in June of 1990 with a simple bowel movement. The problem is exacerbated by bowel movements or upon sitting or driving, and is decreased by standing, lying down or with Carbamazepine-medication prescribed by his neurologist. At the time the patient first sought medical help from a neurologist, he rated the pain as a "7" on a 0-10 scale.

Previous Medical History: At age 9 in August of 1968, the patient was seen by a medical doctor, and he reported that he had been perfectly well and asymptomatic prior to July 1967 when, after having done a good deal of mowing, he noted the onset of acute discomfort transversely in the low back region. This pain was constant for 3 to 4 days, despite the use of heat and bed rest. X-rays were ordered at the time of the visit that revealed an anterolisthesis of L5 on S1, with a step-off of approximately 1 cm. Following this acute episode, the patient noted some occasional twinges and "catching" in the back for several weeks, with symptoms gradually improving on a restricted activity regime. X-rays in 1969 showed no further slippage of the spondylolisthesis, and he was doing quite well with restricted activity. However, he was still symptomatic when exercising —to the point where he had to be excused from physical education. A later set of X-rays in 1972 showed no change in slippage, and no change in symptoms.

In July of 1973, the patient was admitted to the hospital for a surgical fusion. A lumbar fusion with a bone graft from the right iliac crest was performed. The facets of L4, L5 & S1 were eradicated of cartilage, and the TP's were morcellated. Cortical cancellous strips were removed from his right iliac crest, and used to pack the TP's from L4 to L5 and from L5 to the sacral ala on both sides. The facet joints were packed with cancellous bone, and cortical and cancellous strips were inserted over the prepared laminas from L4 to S1. Noted during the surgery was a spina bifida occulta at L5, and at S1 and S2. After surgery, his X-ray report included moderate degenerative change in the

posterior elements in addition to the grade 1 spondylolisthesis.

The patient received relief from pain following the surgery and remained essentially asymptomatic for almost 17 years before the June 1990 episode.

In April of 1991, the patient was referred to a neurologist by his family doctor for the pain previously described as his current chief complaint. Examination by a neurologist revealed no numbness in the perianal area or legs and no muscular weakness. There was no impairment of bowel, bladder or sexual function. He had good strength in all major muscle groups of all four extremities. Left ankle jerk was slightly diminished. There was no sensory loss on the lower extremities, trunk or perineal area. Pain was reported as intermittent- the patient experienced days with no symptoms at all and other days where all his symptoms flared up concurrently. There was a direct correlation between amount of pain experienced and duration of engagement in exacerbating activities such as extended sitting or driving. Pain, however, could also occur for no apparent reason. Pain did not respond to aspirin, so carbamazepine was prescribed, which resulted in a reduction in pain.

An MRI scan of the lumbosacral spine with sections down through the sacrum was ordered. The scan revealed disc bulging at the L3/L4 level without apparent herniation. There was narrowing of the spinal canal due to bony hypertrophy in the posterior canal at that level. The L4/L5 and L5/S1 discs showed signs of degeneration, but no evidence of herniation.

Current Medical History: When the patient presented to the Sid E. Williams Research Center, a complete examination was performed. His history revealed allergies to penicillin and some pollens. He has had problems with constant ringing in the ears since 1977 when he worked in a noisy shoe factory. The patient was treated for prostatitis in 1985. In 1988, he dislocated his left shoulder in a car accident. The dislocation was not treated and currently causes him occasional shoulder joint pain. He now complains of bilateral leg weakness when his legs are in pain. He takes Metamucil daily to avoid the anal pain that would be brought on by constipation.

Physical findings were unremarkable with vital signs within normal limits. Neurological findings included hyposensitivity along the left L4 dermatome. The following Orthopedic Tests were found to be positive: Kemp's (caused pain on the right side, low back), Leg Lowering (caused low back pain as the feet approached the table), Ely's (with the pelvis raising off the table bilaterally) and Trendelenburg (which caused the right pelvis to sink noticeably when standing on his left leg). Cervical Range of Motion showed hypermobility on flexion and hypomobility on left-lateral-flexion. Dorsolumbar Range of Motion showed hypermobility on left and right lateral flexion.

The Chiropractic Examination revealed the following: Palpation noted bilateral pain, tenderness and spasm at the level of C2, and tenderness and spasm at the levels of T3, L3, and at the right sacroiliac joint. Prone leg checks revealed a right negative Derefield. Supine, a leg length deficiency of 8 mm was seen on the right.

An X-ray Examination was done including a Lateral, Nasium, Vertex and A-P Lower Cervical views, A-P and Lateral Dorsals, and A-P and Lateral Lumbar Projections.

The Cervical Films revealed:

a) Posterior cleft deformity at C1,
b) Minimal Hypolordosis with anterior weight bearing and,
c) A Minimal Left Listing.

The Thoracic Films revealed:

a) Minimal Spondylosis at multiple levels, and
b) A very shallow Left Rotatory Thoracolumbar Scoliosis.

The Lumbar Films revealed:

a) Mid and Upper Hypolordosis with anterior weight bearing,
b) Surgical fusion of L4, L5 & S1 secondary to Grade I spondylolisthesis,
c) Minimal discogenic spondylosis at L4/L5 and L5/S1,
d) Continuation of the shallow rotatory thoracolumbar scoliosis to the left.

CHIROPRACTIC CARE & METHODS

The patient was given upper cervical adjustments along a specific vector determined by Grostic analysis[6]. The adjustments were delivered using the Life Cervical Instrument. He was adjusted a total of 14 times over a period of 166 days. Leg length deficiency was used as a primary indicator that an adjustment was required at any one visit. Both pre and post adjustment leg checks were monitored at each visit by an independent assessor blinded to prior assessor's findings. Leg checks were backed up with palpation[7].

At each visit, range of motion and orthopedic tests were performed whether the patient was adjusted or not. Cervical range of motion was measured using a Performance Attainment Associates' CROM device. Dorsolumbar lateral flexion was measured using a goniometer. Three measurements were taken in each range of motion, and the average used as an indicator of range of motion for that day (Graphs #1,2 & 3).

All positive orthopedic tests noted during the physical exam were performed again during each visit (Graph #4). Results were rated according to the scale shown below:

Leg Lowering

4 Sharp severe lingering pain. Cannot hold up legs.
3 Moderate pain, cannot hold up legs.
2 Moderate pain, but can hold up & lower legs.
1 Mild pain, can hold up & lower legs.
0 No pain, holding up & lowering legs.

Ely's

4 Pain precludes getting thigh off table.
3 Hunching of the pelvis bilaterally.
2 Hunching of the pelvis unilaterally.
1 Thigh comes off table with moderate pain.
0 Thigh comes off the table with no pain.

Trendelenburg

4 Severe trendelenburg sign.
2 Moderate Trendelenburg sign.
1 Mild Trendelenburg sign.
0 Negative Trendelenburg sign.

Pain — specifically, low back pain (Graph #5), perianal pain (Graph #6), and posterior thigh pain (Graph #7) was rated by the patient on each visit according to the scale shown below:

Lower Back pain: no pain 0 1 2 3 4 5 6 7 8 9 10

Perianal pain: no pain 0 1 2 3 4 5 6 7 8 9 10

Posterior Thigh pain: no pain 0 1 2 3 4 5 6 7 8 9 10

Medication dosage was monitored from the very beginning, as one of the patient's objectives was to wean himself from the medication. His dosage was graphed according to the following scale:

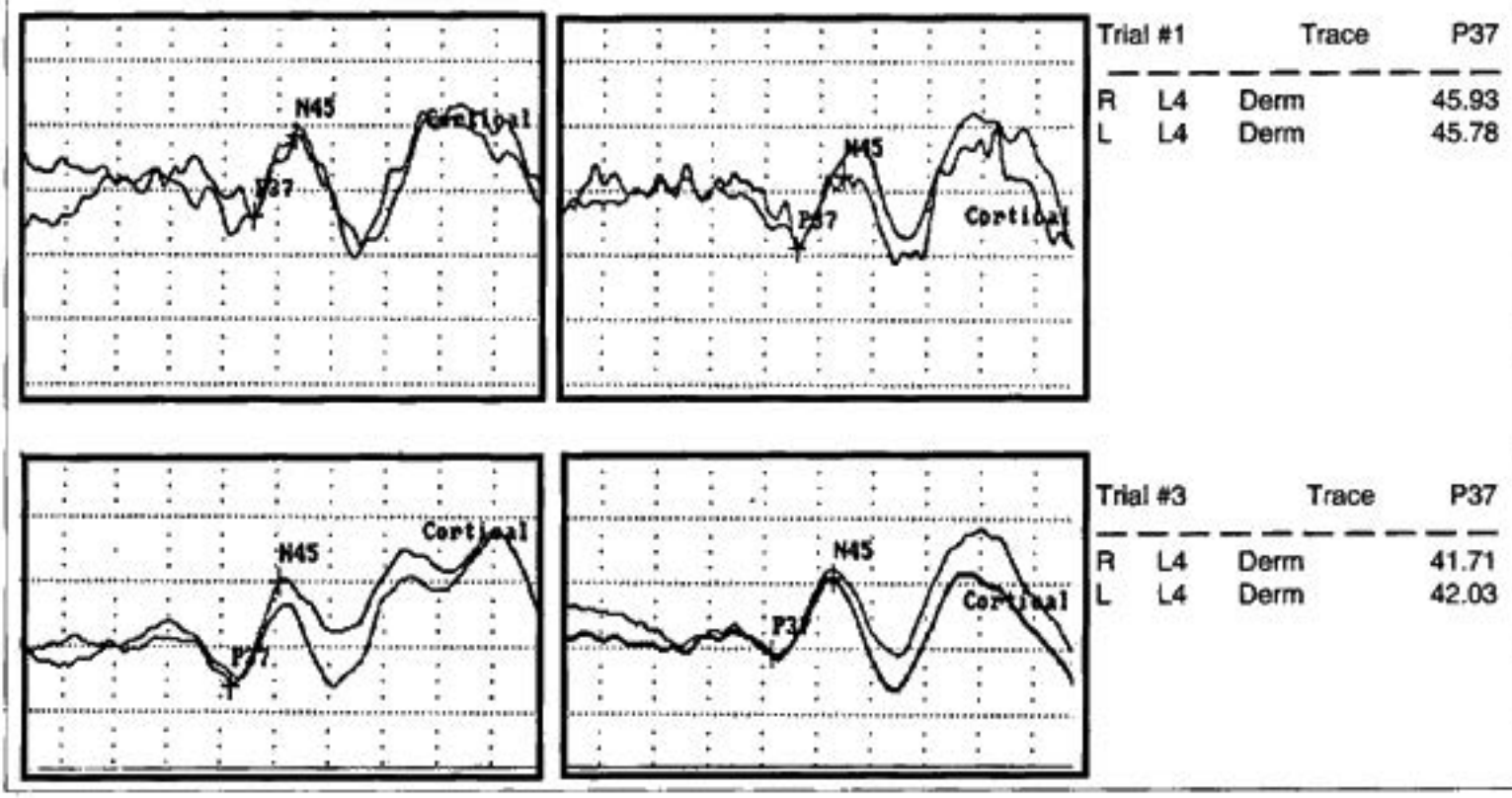
Medication (Circle how much carbamazepine is used daily)

600 mg	400 mg	200 mg	0 mg
3	2	1	0

Follow-up radiographs were taken twice during the study and were analyzed to assess progress and appropriateness of the vectors.

Three Somato-Sensory Evoked Potentials (SSEP's), using the Glick Lumbo-Sacral Protocol[8], were done on the patient during the study. The Cadwell Excell evoked potential signal averaging instrument was used. The common peroneal, posterior tibial, sural (S1 dermatome) and saphenous (L4 dermatome) nerves and the L5 dermatome were tested. The first study was done four months after initiation of the care plan, and was done pre and post-adjustment. The second SSEP was performed 5 months into the study on a day when the patient did not need to be adjusted. The last SSEP was done at the end of the study, he was determined to be in adjustment on this day. The results are reported in the following section (Figure #1).

Figure #1



RESULTS

Subluxation - The radiographic study and analysis showed that the patient's subluxation had been reduced by 40% in laterality and 33% in rotation, the second post set revealed an 80% reduction in the laterality.

Pain - was rated by the patient early each visit with instructions to report only how he had felt in the last 24 hours (Graphs #5,6 & 7).

Perianal Pain - the patient's chief complaint, was rated as a "7" when the study began. After his first adjustment, his first peak was reported as a 6 and on later cycles, the peak went down to 5 and 4 and so on. The marked spike of pain 90 days into treatment represents how he felt after returning from a 9 day vacation involving over 45 hours of driving - a known exacerbating condition to the patient. Though he had been holding his adjustments longer, his atlas apparently went out during the vacation, and he returned in considerable pain. It took nearly 4 weeks to recover from the vaca-

tion. Perianal pain levels changed during the study from an average of 7 to an average of 3.2 with s = 1.8. Low Back Pain levels decreased, from an average of 3 before the study to an average of 2.3 with s = 1.5. Posterior Thigh Pain levels also decreased, from an average of 7 before the study to an average of 1.3 with s=1.6.

Medication - One of the patient's chief objectives was to get off Carbamazepine. On consultation with his neurologist, he was advised to slowly wean off the drug. So concurrent with the treatment, the patient was slowly reducing his daily dose from his starting level at 600 mg/day until he eventually was taking none. When the study ended, the patient was taking nothing stronger than an occasional aspirin, which, prior to this study, had no effect on his pain. Though the patient experienced slight rebounds in his symptoms as he reduced his drug dosage, the overall pain trends continued to go down even as the patient got off the drugs.

Range of Motion - Both Cervical and Dorsolumbar Range of Motion measurements were converted to show percent hypo/hypermobility from normal so that changes in all motions measured could be shown on a single scale. "Zero" on the Y-axis of the graph represents normal range of motion in all the following graphs showing range of motion (Graphs #1,2 & 3). The patient was more often than not, hypermobile. One of the objectives of his care plan was to re-align his cervical area, without introducing more hypermobility into his spine. This goal was accomplished in cervical flexion and extension, where the range of motion did not change appreciably. The patient started the study with 22% hypomobility on Cervical Left Lateral Flexion. This hypomobility was corrected by the end of the study. As a general rule of thumb, range of motion in whatever motion we measured had a tendency to converge toward normal as time went on.

Orthopedic and Neurological Exams - Improvement was seen in all objective orthopedic and neurological exams (Graph #4). On his rephysical, it was noted that the hyposensitivity along his left L4 dermatome had disappeared. Kemp's was no longer positive. Leg lowering no longer caused pain; Trendelenburg was negative; Ely's, the slowest to improve changed from bilateral hunching of the pelvis to unilateral hunching of the pelvis.

SSEP Testing - The first lumbo-sacral SSEP was done 4 months after initiation of this patients chiropractic care. This test revealed significant increase of latencies of P37 on the cortical waveforms evoked from the saphenous nerve (L4 dermatome) bilaterally, indicating an impairment of conduction at this segmental level. Evoked potentials from all the other nerves tested were within the upper limits of normal.[9] A second SSEP done 3 weeks after the first, showed slight decreases (less than 2 ms.) in latency on all the evoked potentials and slight increases in amplitude of the P37-N45 waveforms. At the end of this study, the SSEP demonstrated a significant decrease in the latency of the evoked potential elicited from the L4 dermatome (Figure #1). A significant decrease is generally thought to be greater than a 3 ms. change.[10,11,12] This decrease in latency to normal values for L4 dermatome indicate intact conduction at this level now. The latency of P37 decreased 3.75 ms. on the left and 4.22 ms. on the right. These findings correlated well with other diagnostic testing. An MRI scan of the lumbosacral spine revealed disc bulging at the L3/L4 level, and sensory dermatome testing during our physical revealed hyposensitivity of the left L4 dermatome. Although a post MRI was not performed, hyposensitivity along the left L4 dermatome did disappear.

DISCUSSION

Upper Cervical Technique was selected for this patient for a number of reasons. All pathological findings and symptoms traced back to spinal nerve problems at levels that were surgically fused. These fused segments could not be osseously adjusted, so some other subluxation-based approach had to be identified.

Because of the fusion, other segments in the upper spine had to compensate, creating hypermobility and a tendency toward degeneration.[13] Adjusting these hypermobile dorsolumbar segments was not seen as key to any solution. Indeed, it was probable that further instability would be created. Upper cervical adjusting appeared to offer a rational solution to this dilemma.

However, the patient had a spina bifida at C1. This meant that if upper cervical adjusting was to be done, a gentle form of adjusting would have to be used. After all constraints were taken into account, Life Cervical Technique, a technique emphasizing precise alignment of Atlas, was selected as the method of choice for adjusting.

But why would one consider adjusting the atlas for a low back pain patient? Many chiropractors have had success with severe low back pain and sciatica using exclusively upper cervical adjusting methods. The Dentate Ligament Hypothesis, as put forth by John D. Grostic, D.C., provides a rational model for this. It states that misalignments of the upper cervical vertebrae, because of their unique attachments to the spinal cord by means of the dentate ligaments[13,14] can stress and deform the spinal cord.[15] The hypothesis further states that in addition to the stress on the cord and direct mechanical irritation, venous occlusion with stasis of blood and resulting anoxia in parts of the upper cervical cord can occur.

It has been noted that neurological manifestations can be observed in patients with a cervical misalignment of as little as 0.75 degrees. These neurological manifestations include a positive supine leg length test with a difference in leg lengths of greater than 8mm.[17] This patient had significant cervical rotation and his supine leg check prior to the study consistently exceeded 8 mm.

Should the fusion have been done? Though we have the benefit of hindsight that the original surgeons did not have, the patient's history reveals that after his pain started in 1968, the patient was repeatedly X-rayed for his condition over a course of 5 years with no further anterior slippage of his anterolisthesis. The symptoms had improved on a restricted activity regime. Today, we know that the L4/L5/S1 motor units are the most mobile lumbar segments, and that fusion at either or both levels significantly alters the normal spinal motion and increases the stress of adjacent segments.[18] This stress leads to premature degenerative changes at the compensating levels. Therefore, fusion of the lower lumbar spine should not be done without an excellent reason. Furthermore, some researchers now claim that 30% - 40% of postfusion patients experience recurrent or persistent low back pain[3]. Another study goes on to say that 90% of low back pain patients treated conservatively without surgery will show improvement, while only 70% of those treated surgically show improvements[19]. Long term studies have shown that only 10% of patients treated surgically demonstrate full return to their previous lifestyles without developing a problem secondary to the original injury.[20]

CONCLUSIONS

A case study is presented in which a patient suffering from post-surgical low back pain received positive results from an Upper Cervical technique when medical treatment had failed. Atlas misalignment was hypothesized to be the greatest contributing cause of the patient's pain symptoms. The patient showed improvement in both subjective and objective measurements after starting treatment. The success of the treatment supports the hypothesis, and further suggests that upper cervical adjustments be considered when conservative treatment of low back pain is required.

ACKNOWLEDGMENTS

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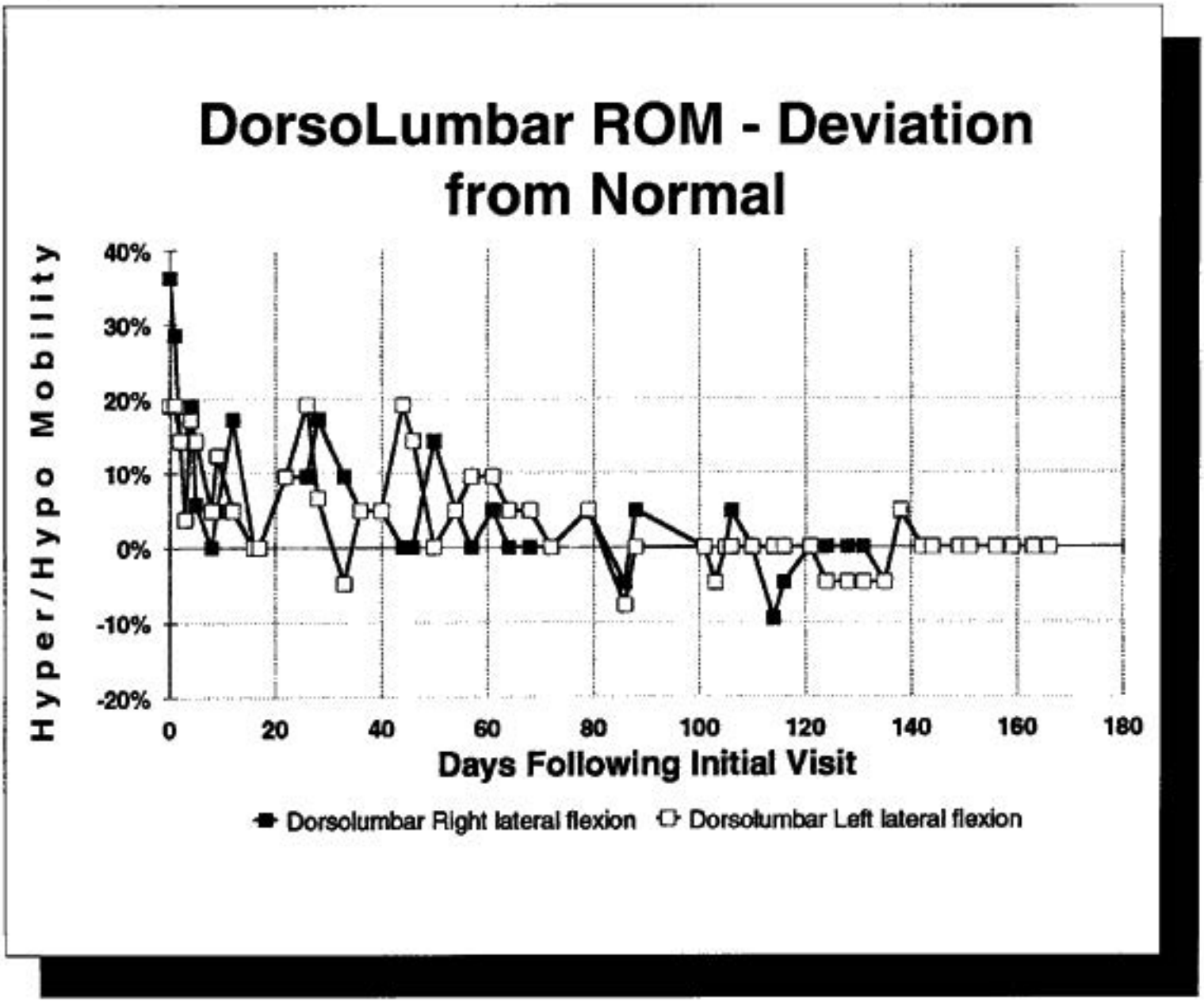
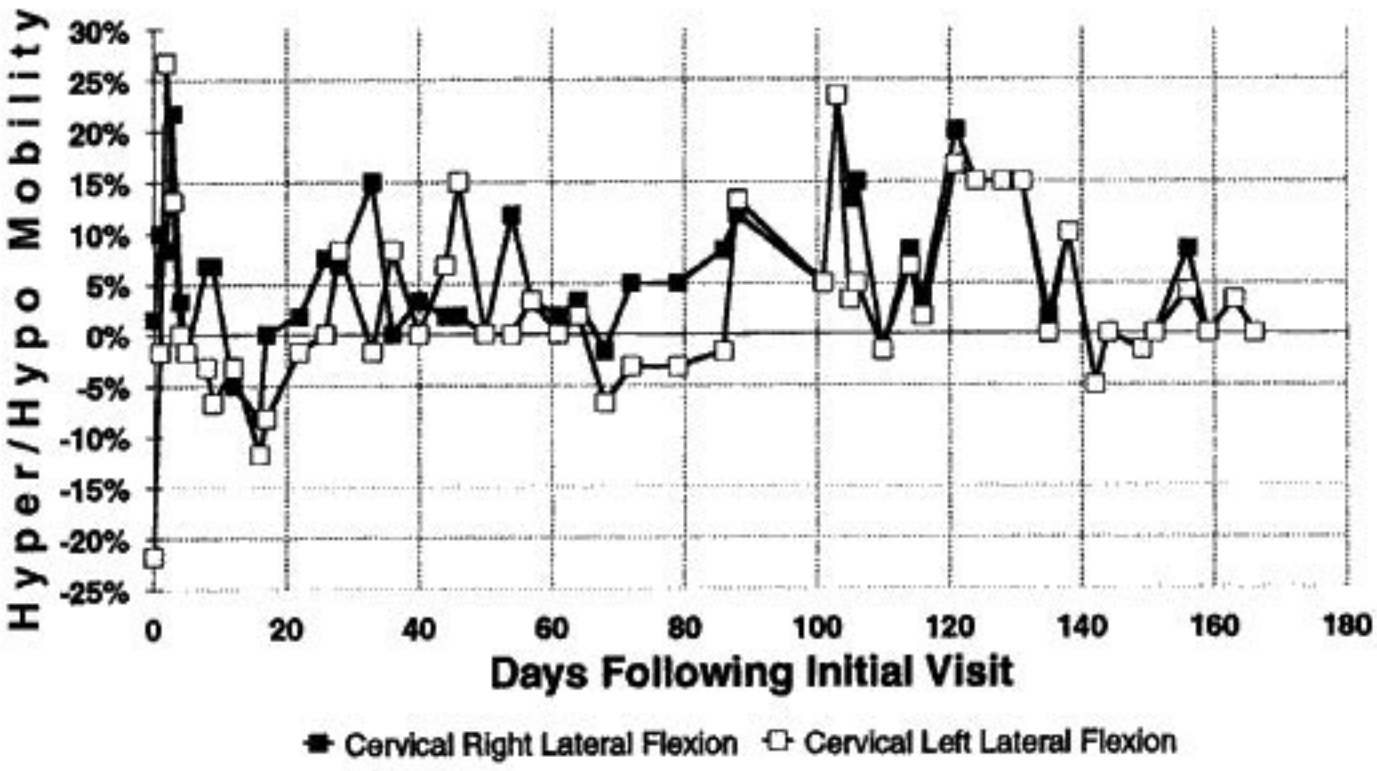
GRAPHS

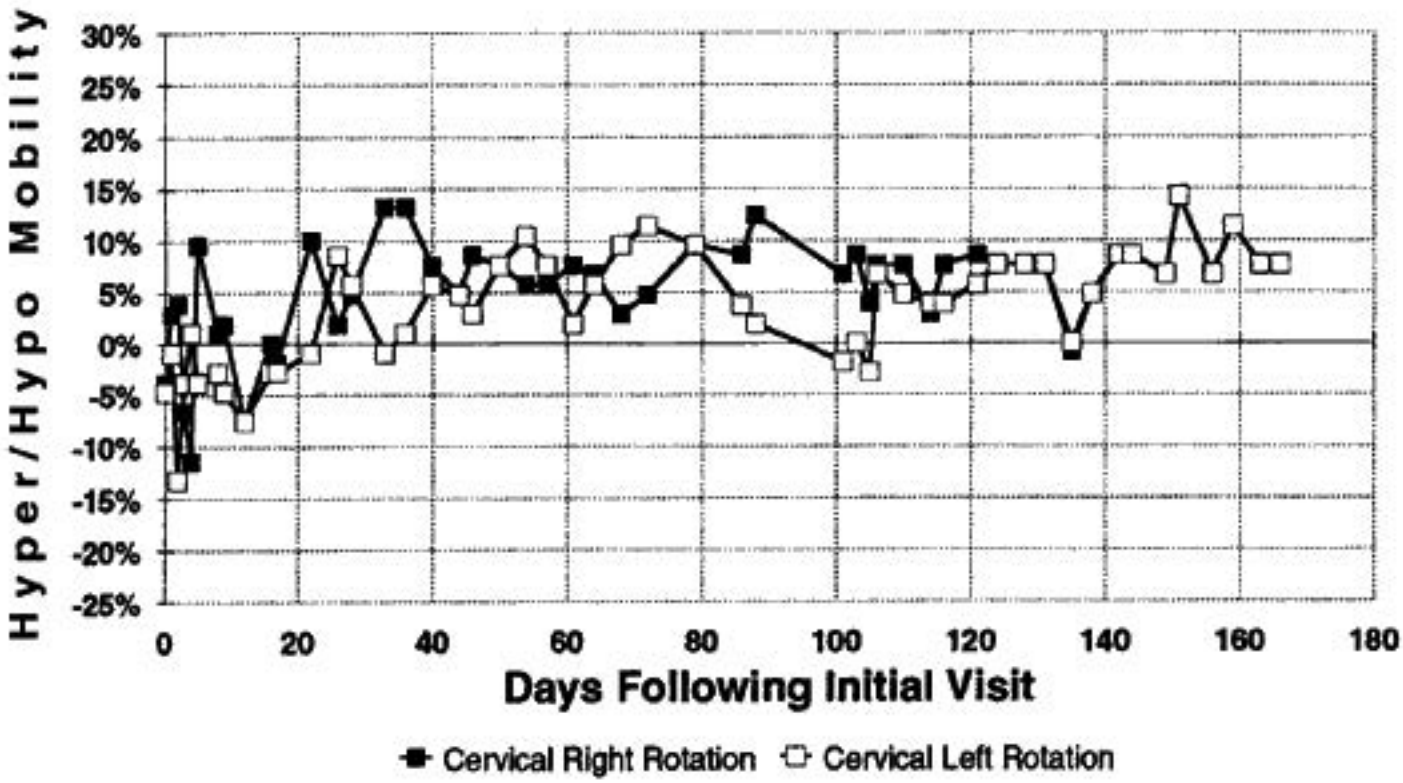
Graph #1 Case #R00160

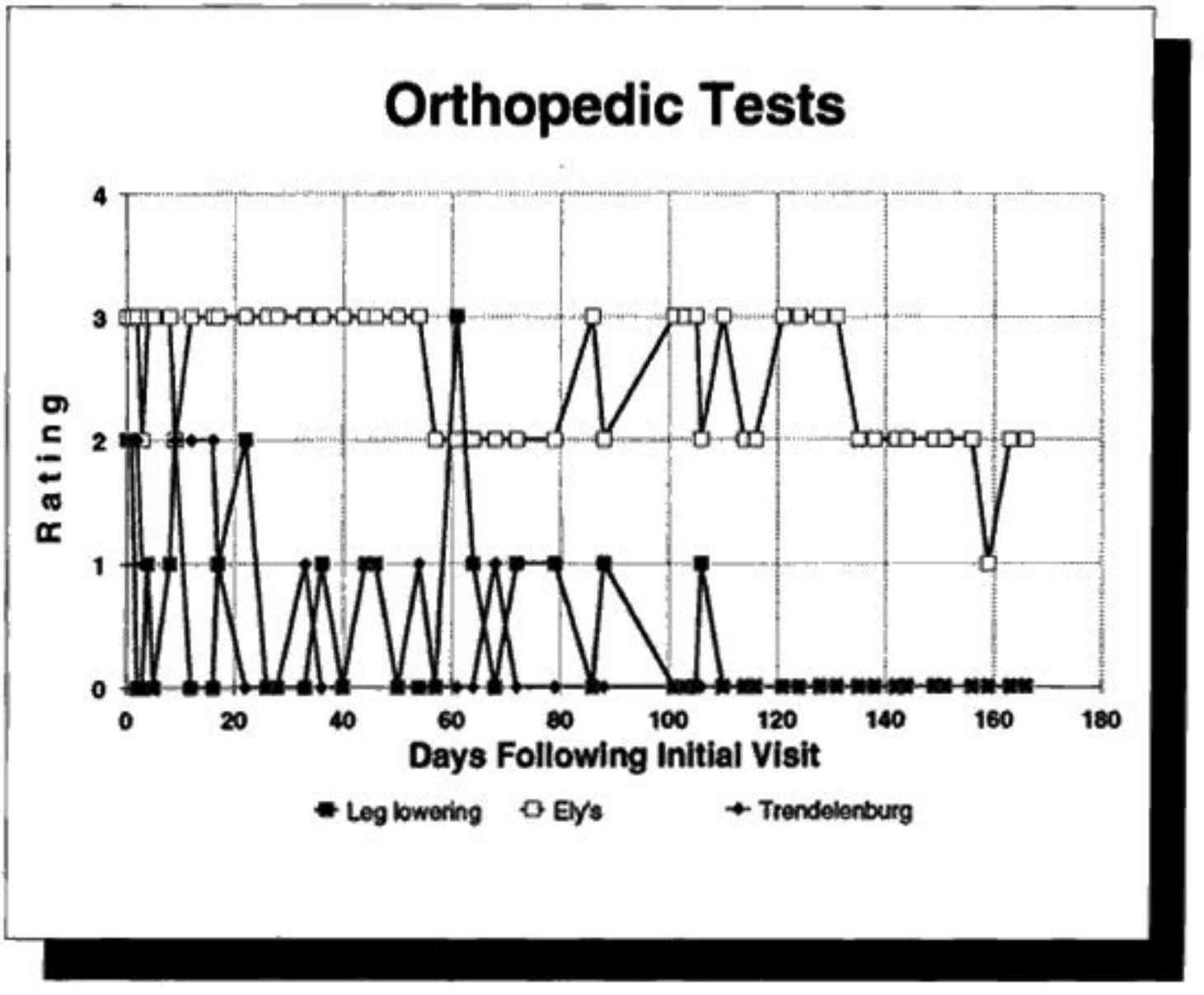


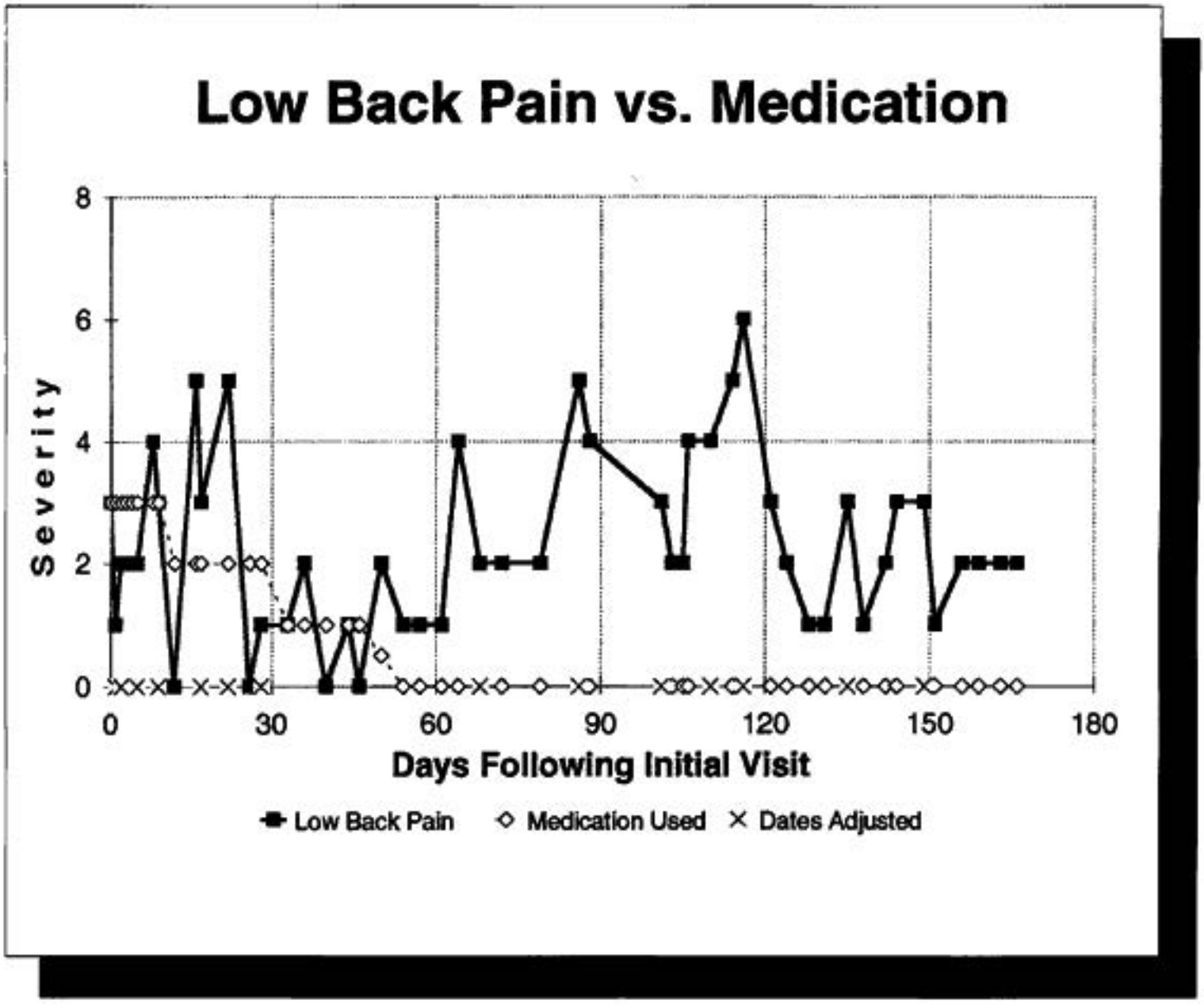
Cervical Lateral Flexion - Deviation from Normal



Cervical Rotation - Deviation from Normal




Orthopedic Tests
Rating
4
3
2
1
0
0
20
40
60
80
100
120
140
160
180
Days Following Initial Visit
Leg lowering
Ely's
Trendelenburg


Low Back Pain vs. Medication
Severity
8
6
4
2
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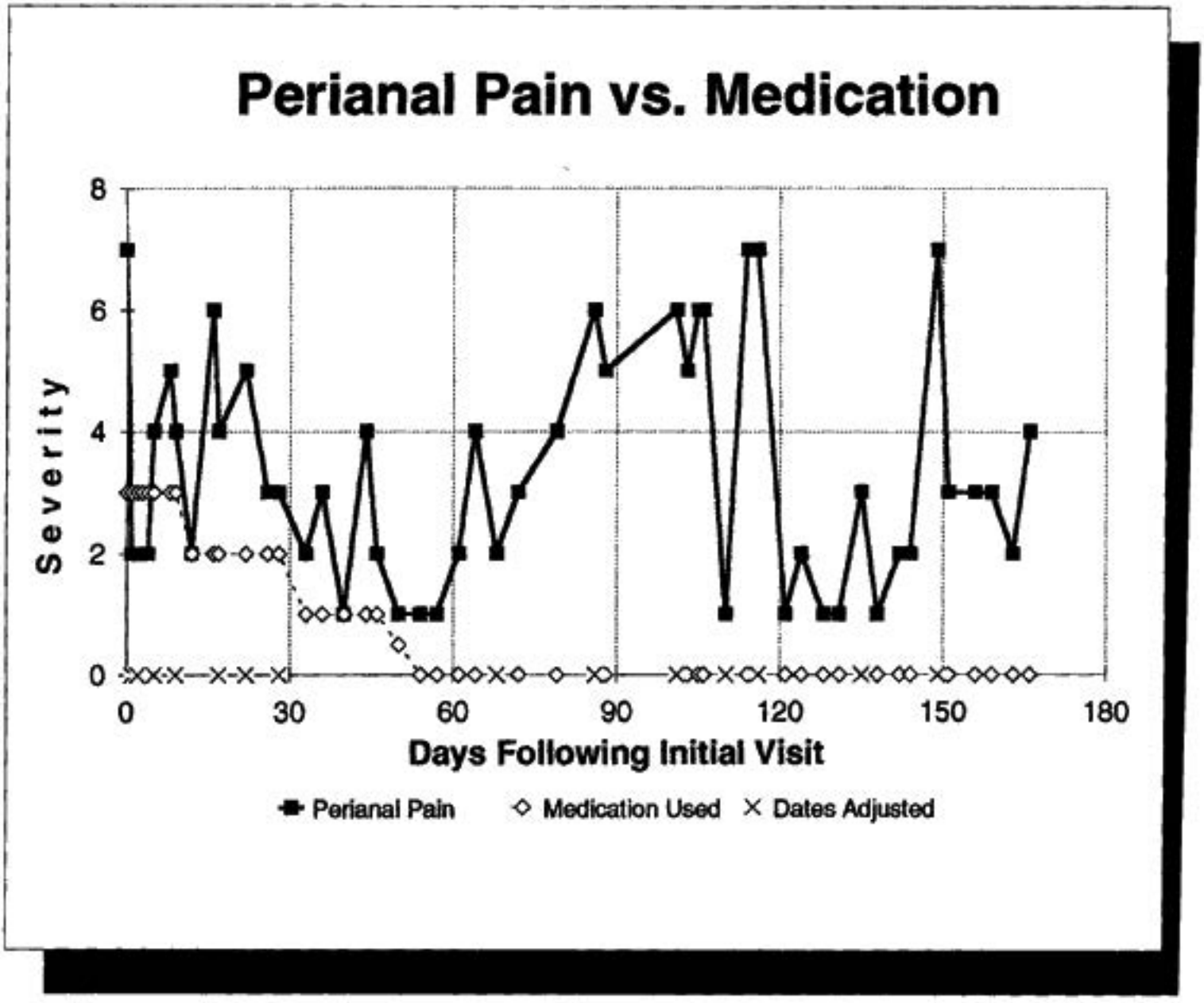
0
30
60
90
120
150
180
Days Following Initial Visit
Low Back Pain
Medication Used
Dates Adjusted


Perianal Pain vs. Medication
Severity
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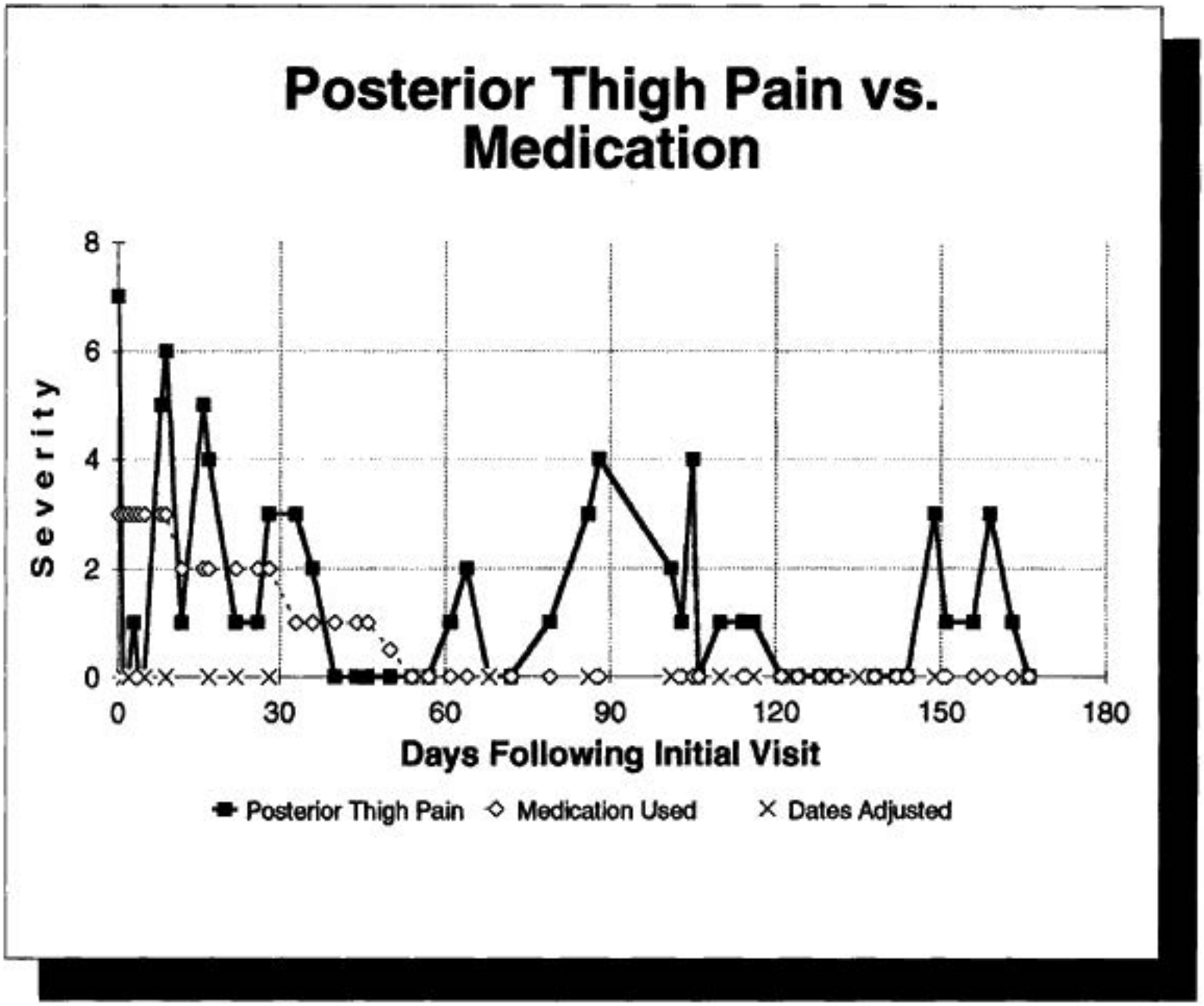
Days Following Initial Visit
Perianal Pain
Medication Used
Dates Adjusted


Posterior Thigh Pain vs. Medication
Severity
8
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Days Following Initial Visit
Posterior Thigh Pain
Medication Used
Dates Adjusted