0008-3194/92/17–21/$2.00/©JCCA 1992

Cervical disc herniation missed at operation: a case report

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Disc herniations are less common in the cervical spine than in the lumbar spine. Nevertheless, chiropractors can anticipate seeing a small number of patients with this problem on an annual basis. When confronted with this problem, it is important to diagnose the level of the herniation. This report describes a case in which a cervical disc herniation was treated surgically at the wrong level. The patient subsequently presented for chiropractic treatment. He was pain-free upon completion of a short course of manipulation.
(JCCA 1992; 36(1):17–21)

KEY WORDS: cervical spine, disc herniation, discectomy, manipulation, chiropractic.

L'hernie discale est moins fréquente dans la région cervicale que dans la région lombaire, mais le chiropraticien doit quand même s'attendre à en voir quelques cas par année. Devant une telle situation, il est important de bien diagnostiquer le niveau de l'hernie. Ce rapport porte sur un cas où une hernie cervicale fut traitée par chirurgie, mais au mauvais niveau. Le patient s'est ensuite présenté pour recevoir des soins chiropratiques et la douleur est complètement disparue après une courte période de manipulations.
(JCCA 1992; 36(1):17–21)

MOTS-CLÉS : colonne cervicale, hernie discale, discotomie, manipulation, chiropratique.

Introduction

Patients with neck and arm pain resulting from cervical disc herniation will often seek chiropractic treatment. Herniations occur less commonly in the neck than in the low back. In fact, they are a fairly rare occurrence. In one twenty-five year study, an incidence of 5.5 per 100,000 population was reported.[1] Cervical spine disc herniations tend to occur evenly in the age range from twenty to fifty-five years and are more prevalent in men.[2] The most commonly affected levels are C5–C6 and C6–C7.

It can be a challenge to accurately diagnose the level of a cervical spine disc herniation. The clinical signs and symptoms do not always correspond to the anatomical level of the disc damage. In such cases, the more accurate diagnostic methods are usually those which are completely objective. Imaging techniques such as computed tomography (CT), magnetic resonance imaging (MRI), and myelogram are good examples.

Case report

A twenty-eight year old male presented to the clinic with a four and a half month history of neck pain with radiation into the right arm. This began as he was bending forward while carrying his step-daughter on his shoulders. He felt upper back pain immediately, and neck pain developed within hours. The next morning, he awoke with right arm and hand numbness. Two days later he was seen at a hospital and radiographs of his neck were taken. (Figure 1)

Within a few days he was admitted and a myelogram was performed. The findings are diagnostic of a C6–C7 disc herniation on the right side. (Figure 2) The anteroposterior view shows a large filling defect on the right. This obliterates the axillary root pouch and displaces the thecal sac medially. These findings are characteristic of a posterolateral disc herniation.

On admission, he complained of right-sided neck pain radiating into the lateral arm and numbness in the lateral three fingers with weakness of the triceps and biceps. Examination showed no muscle weakness or atrophy, but biceps, triceps, and brachioadialis reflexes were absent.

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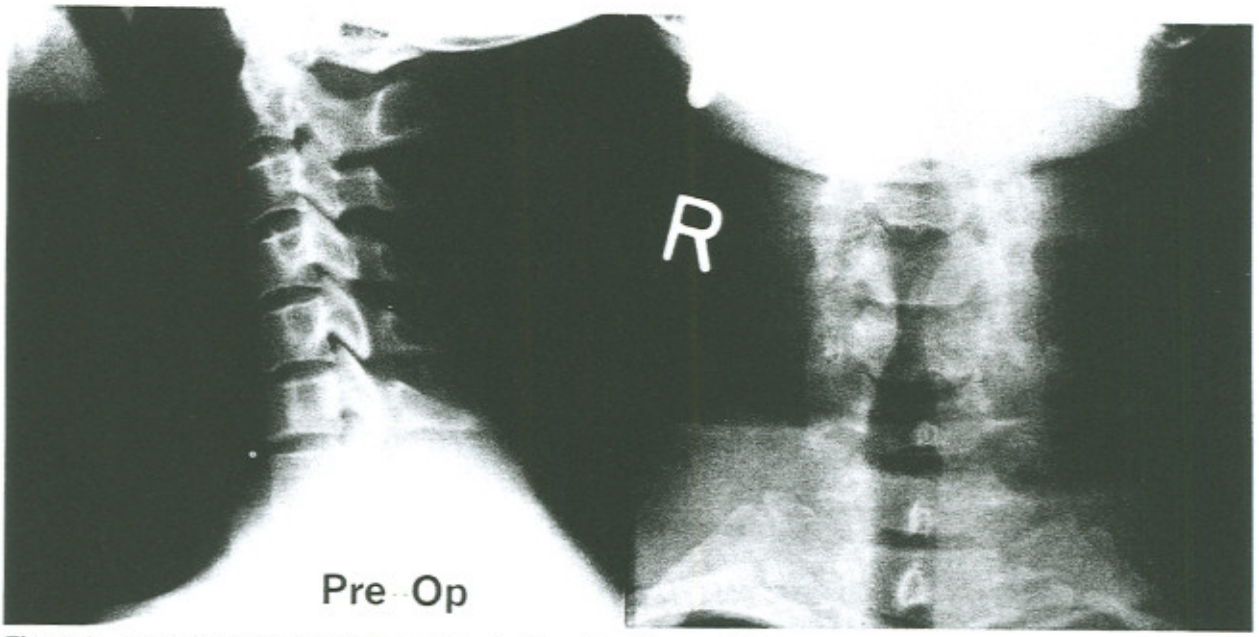

Figure 1 Pre-operative anteroposterior and lateral radiographs of the cervical spine.

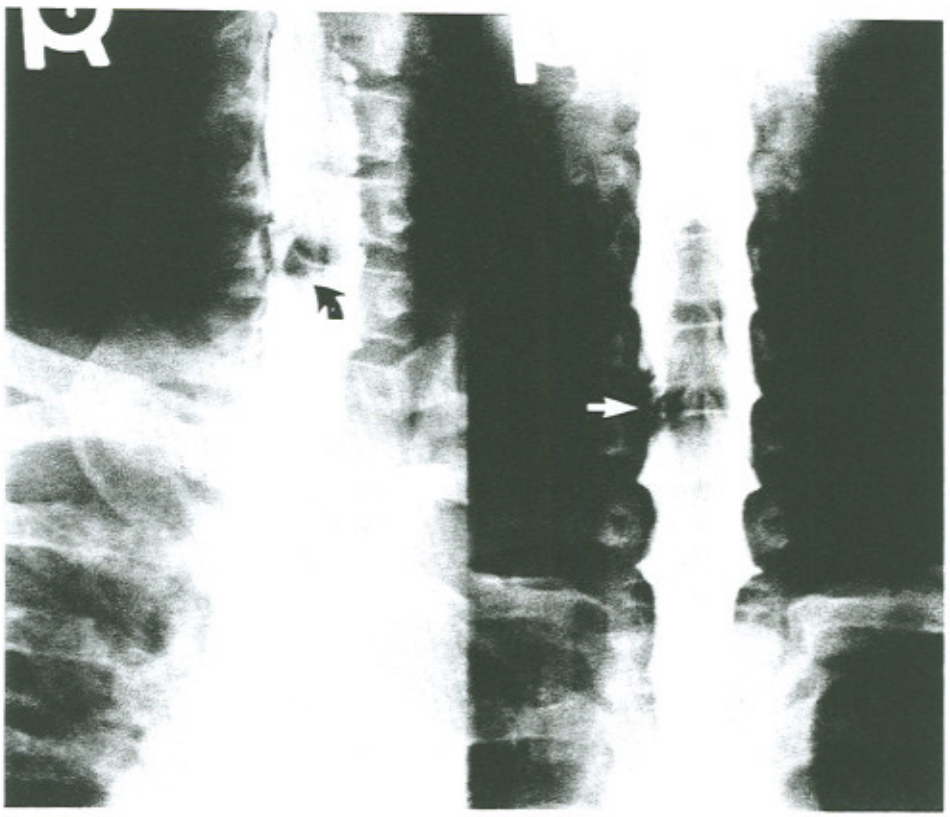

Figure 2 Oblique and anteroposterior myelogram. A large filling defect is seen on the right side at the C6–C7 level (arrows).

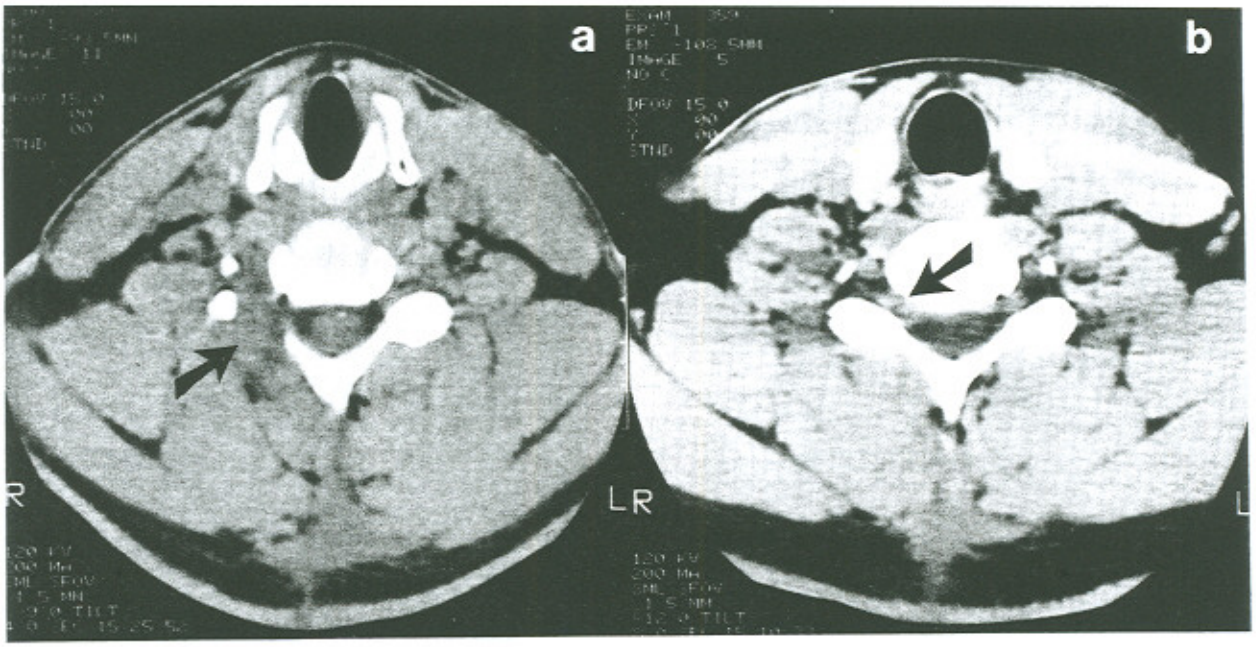

Figure 3 A and B. **3A.** Transverse CT section through the C5–C6 level indicating a laminectomy and foramenotomy at this level (arrow).
3B. Transverse CT section through the C6–C7 level reveals that the disc herniation is still present (arrow).

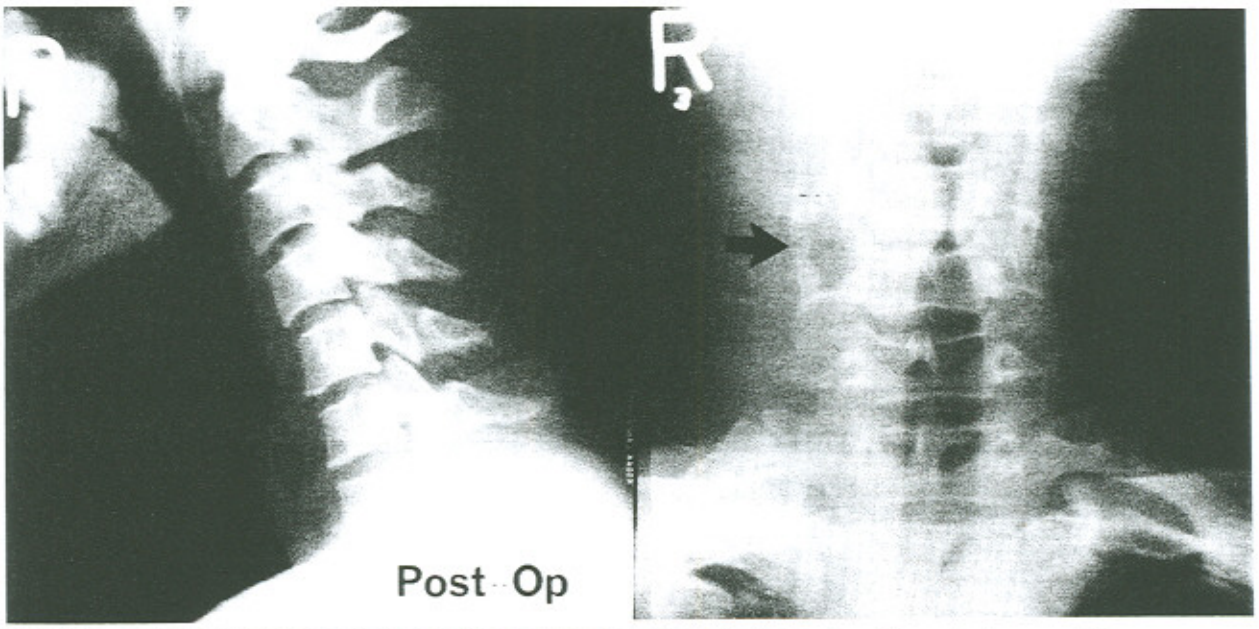

Figure 4 Post-operative anteroposterior and lateral radiographs of the cervical spine. Careful examination reveals the foramenotomy at the C5–C6 level (arrow).

The patient was then taken to the operating room for a C6–C7 discectomy. The surgical report noted that no obvious disc protrusion was found. At discharge, he complained of persistent pain in the arm.

After a review visit to the surgeon six weeks postoperatively, the patient underwent a CT scan. This examination revealed that the C6–C7 disc herniation was still present. (Figure 3b) It was also evident that the surgical procedure involved laminectomy and foramenotomy at the C5–C6 level. (Figure 3a) Careful examination of the postoperative radiographs reveals that the surgical procedure was performed at the C5–C6 level. (Figure 4) At that point he was offered further surgery and declined.

He presented to the chiropractic clinic three months later. At that time, he had lower right-sided neck pain. There was radiation of pain into the right trapezius muscle. He was experiencing occasional numbness in the arm. One month previous to the initial chiropractic visit, he had returned to his regular occupation as a meat packer and this aggravated his neck pain. Flexion and extension also aggravated the pain; it was relieved by rest. He had no history of neck pain prior to this complaint.

On examination, cervical spine range of motion was full and pain free except for extension and right rotation, both of which exacerbated his symptoms. There was loss of light touch sensation on the C6 dermatome in the right hand. The right biceps muscle was graded at 4/5. The right biceps and brachioradialis reflexes were absent. One centimeter of wasting had occurred in the right biceps muscle.

This man was given a regimen of treatment consisting only of gentle cervical spinal manipulation at the level of the herniation on the painful side. After one and a half weeks of treatment, he reported that he felt eighty percent better, with only slight pain in his neck. Arm symptoms were absent at this point. When reviewed three weeks later he was pain free. However, he still had slight weakness graded at the 4+/5 of the right wrist extensor muscles.

Discussion

This case illustrates several points. Firstly, surgery was performed on the wrong level. Secondly, he recovered from his neck pain and radiculopathy after a regimen of chiropractic treatment.

In this case, the surgery was carried out at the wrong level and on the wrong nerve root. It is impossible to be certain of the combination of factors that led to this error. However, by examining the myelogram, the operative report, and the postoperative CT scan, several explanations are possible.

It is well-known to surgeons that clinical evidence, even that which is very suggestive of a particular nerve root, should be confirmed by an appropriate imaging technique.[3,4] There is a high degree of variability of the level at which spinal nerves exit the spinal column. In the lumbar spine, as high as 14% of nerve roots exit at the wrong level.[5]

The combination of decreased biceps strength, absence of the biceps and brachioradialis reflexes, and the altered sensation in the C6 dermatome, would indicate that the C6 nerve root is affected. Most commonly, the C6 nerve root exists at the C5–C6 interspace. In this case, however, the myelogram indicated that the herniation was at the C6–C7 level. The operative report stated that the C6–C7 disc was removed suggesting that there was either an anatomical anomaly or confusion of landmarks.

The phenomenon of conjoined nerve roots, in which fibres of a spinal root exit the spine at an unusual level, could explain how the symptoms could result from a C6–C7 disc herniation.[5,6] On the other hand, the possible existence of a post-fixed brachial plexus, where the T1 and T2 nerve roots provide large contributions to the plexus and change the innervation of the muscles one level below normal, could explain the confusion.[7,8]

Another possibility is that the surgeon may have oriented the procedure incorrectly by using the wrong landmarks. In the operative report, it is stated that the spinous process of C7 was identified as being the first prominent vertebra. Using this landmark, he centred the incision over what he thought were the C6–C7 spinous processes. In fact, this was the C5–C6 interspace. In addition, the patient may have had a particularly long C6 spinous process. In up to 11% of the population, C6 and not C7 is the vertebra prominens.[9]

This last situation raises several issues. First, a mistake was made. The patient underwent an inappropriate surgical procedure from which he received no benefit. Even though the chiropractor is not involved in these events, he becomes involved when he begins to care for the patient.

Another issue is the potential legal repercussions which may result from this case. A lawsuit may arise from the fact that the wrong level was operated on, which is possibly malpractice. Alternatively, the chiropractor may be liable for determining what has happened and choosing not to inform the patient. The question then arises as to whether the patient should be told by the chiropractor.

In this case, a letter was sent to the patient's family physician explaining the findings and the patient was sent to see him. As it was the family doctor who chose the surgeon, we thought that it should be his responsibility to inform the patient. He had not known of the error and was appreciative of the information about the mutual patient. In this way, the general practitioner must take the initiative to inform the patient and to discuss the potential ramifications. Therefore, the chiropractor does not appear too anxious to lay blame. This is particularly important if the surgeon is a source of patient referral. However, the patient's right to know supercedes other considerations.

Conclusion

Disc herniations within the cervical spine occur less commonly than in the lumbar spine. In fact, the incidence is quite low. Patients with this condition will, however, seek chiropractic treatment for relief of their discomfort. The greatest challenge in dealing with these patients is to make an accurate diagnosis. This can be complicated by conflicting evidence from clinical

signs and symptoms and imaging techniques. In addition, anatomical variations of nerve root levels can further confuse the clinical picture.

Acknowledgements

We wish to thank the Chiropractors' Association of Saskatchewan, the Chiropractic Foundation for Spinal Research, and the Canadian Memorial Chiropractic College for financial assistance in preparing this manuscript, and the Department of Medical Photography at the Royal University Hospital for assistance with photography.

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