PHANTOM LIMB SYNDROME ASSOCIATED WITH HERNIATED NUCLEUS PULPOSUS

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A review of the literature revealed three contributions dealing with the problem of lumbosacral radiculitis and/or herniated lumbar discs in patients with amputations of the leg. Ricard and Girard\(^1\) described a patient in whom sciatic and causalgic pain developed in a phantom limb 4 years after the amputation. Although a pre-operative diagnosis of herniated disc had been made, an extradural cyst of the 5th lumbar nerve root was found instead. This finding seemed to offer a satisfactory explanation for the symptoms present in this case. On the basis of their observation the authors further submitted the hypothesis that the "phantom" may be caused by intraspinal changes (resulting from excessive lumbar motility caused by amputation with a prosthetic device) involving the nerve roots and causing vasomotor paresthesias and pains.

Perazzini\(^2\) reported 2 cases of herniated nucleus pulposus in leg amputees. In both instances, however, the disc protrusions were verified at operation on the side opposite to the amputation. The author concluded that increased strain on the lumbar spine produced by ambulating with a prosthesis may hasten the onset of symptoms in individuals predisposed to discogenic disease. Since both cases presented a protruded disc opposite to the amputation, the author speculated on the clinical picture in ipsilateral lesions.

Bonica\(^1\) presented an interesting case of a 54-year-old woman who experienced what were apparently symptoms of a herniated nucleus pulposus in 1936. These were described as shooting pains in the back of the thigh radiating to the foot, with aggravation by coughing, sneezing and straining. Her physician injected the sciatic nerve with procaine and later with alcohol. The temporary relief afforded by this procedure was followed by increased pain; in addition to the shooting pain there was now a burning discomfort apparently associated with an alcoholic neuritis. The pain became so severe that an amputation of the lower end of the thigh was performed at the patient's request. She continued to suffer increasingly, and in addition to her previous symptoms there developed a moderately painful phantom limb. During the next 8 years the stump was revised twice, and a rhizotomy and two unilateral cordotomies were performed without effect. Following a detailed neurological examination including myelography, two herniated discs at the 3rd and 4th lumbar interspaces were removed. The severe shooting pain disappeared, yet the phantom sensation associated with mild pain persisted.

CASE REPORTS

Case 1. A 52-year-old white male had an amputation below the right knee for Buerger's disease in November 1945. Following the amputation the patient experienced a painless phantom limb. In July 1948, he fell out of a chair and twisted his back. Several hours later he noted extremely severe pain in the lower back with radiation into the stump and phantom of the right lower extremity. He described the radicular component of his pain as radiating across the posterior aspect of the right buttock and right thigh to the knee, and then along
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the posterolateral aspect of the phantom limb as far as the ankle. The pain was aggravated by coughing, sneezing, and straining at stool. One month after onset of his pain the patient was referred to the hospital with the diagnosis of neuroma of the amputation stump.

Examination did not reveal any areas of tenderness at the end of the well-healed stump. The pertinent findings were marked spasm of the paraspinal muscles in the lumbar region bilaterally; extremely severe local pain on compression to the right of the 3rd, 4th, and 5th lumbar spinous processes; and pain on straight leg raising bilaterally, greater on the right. A myelogram confirmed the clinical impression of a herniated nucleus pulposus at the L5-S1 interspace on the right.

In November 1948, an interlaminar excision of this protruded disc was performed. The patient has had no recurrence of his symptoms up to the present time.

Case 2. A 24-year-old white male had onset of stiffness and mild low-back pain associated with radiation of the pain to the left lower extremity in 1950. This persisted until March 1954, when the patient was struck by an automobile, sustaining severe multiple compound comminuted fractures, necessitating amputation of the left lower extremity above the knee. Shortly following the amputation a painful phantom limb developed. There was severe pain in the phantom ankle with extension to the plantar surface of the 1st metatarsal (ball of the foot) and a tingling sensation to all five toes. Occasionally the phantom pain became severe, and at these times he would experience a sensation of the limb being twisted into a distorted position. The low-back pain with radiation into the left leg that the patient suffered prior to his accident returned when he began ambulation with a prosthesis. This was described as pain in the left lower lumbar region, migrating to the buttock, skipping the thigh, and passing from the popliteal space down the posterior aspect of the calf to the ankle. He had no difficulty in differentiating this type of pain from his phantom limb pain. He was admitted in November 1955 for “painful phantom limb.”

Examination revealed a well-healed scar at the stump with no local areas of tenderness, a tilted pelvis, spasm of the left lumbar paravertebral muscle and tenderness over the L5 spinous process. The straight leg raising test produced low-back pain on elevation of the right leg, but no pain on elevation of the stump. A filling defect was seen at the L4–L5 interspace on myelography.

In January 1956, an interlaminar excision of a herniated nucleus pulposus at L4–L5 on the left was followed with clinical relief of low-back pain and radiculitis. The painful phantom limb has persisted unchanged.

CONCLUSION

In the 2 cases presented, radicular pain (caused by a herniated nucleus pulposus) and phantom limb symptoms existed simultaneously in the same extremity. The independence of each modality is clearly demonstrated by the postoperative disappearance of the radicular pain with persistence of phantom limb symptoms. This seems to invalidate the notion that mechanical factors involving the spinal nerve roots play a part in the production of phantom limb sensation or pain. Both patients were initially referred to the hospital with a diagnosis other than herniated nucleus pulposus. The coincidence of radiculitis and phantom limb symptoms should be considered in the differential diagnosis. A careful analysis of the pattern of pain may offer a clue to suspect a herniated nucleus pulposus.

The following factors aided in arriving at the diagnosis of herniated nucleus pulposus in the presence of an ipsilateral amputation:

a) The history of a change in the pattern of the “phantom limb” symptoms as well as the appearance of low-back symptoms and signs.

b) The radicular component of the pain was referred to the phantom limb as if projected to the normal dermatome distribution of a specific lumbar or sacral nerve root.