Discography: Its Role in the Diagnosis of Lumbar Disc Protrusion

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The diagnosis and treatment of lumbar disc protrusions are usually straightforward and effective. In some patients, however, an accurate diagnosis cannot be made. Exploratory surgery may be performed in an effort to find and to remove the offending disc. If this fails, the patient becomes even more uncomfortable. Surgery should aim to preserve the integrity of normal tissue whenever possible and, therefore, should be therapeutic rather than diagnostic.

We have tried discography as an adjunct to myelography in order to clarify the diagnosis in those patients suspected of harboring disc protrusions but whose myelograms were normal or equivocal. We also wished, in a specific series, to compare the accuracy of discography with that of myelography.

Clinical Material and Method

We studied 57 patients who entered the hospital with a clinical diagnosis of lumbar disc protrusion. Of these, 37 were admitted to one service in consecutive order. The rest were selected when an accurate diagnosis could not be made by clinical evaluation and myelography. There were 29 men and 28 women, most of whom were in their 30's and 40's.

Each patient was first seen and examined in the outpatient department where a clinical diagnosis of lumbar disc protrusion was made. An extensive trial of conservative treatment was instigated under the supervision of the examining surgeon and a physiatrist. This consisted of a minimum of 2 weeks of complete bed rest followed by gradual ambulation and back-strengthening exercises. If this failed, the patient was hospitalized. After a further thorough examination a decision was made whether to continue conservative therapy or to consider surgery. If surgery seemed to be the only answer, a myelogram was performed. In the specific series of 37 consecutive patients, the myelogram was followed by discography a few days later, whether or not the myelogram revealed a disc protrusion. The remaining 20 patients underwent discography only when their myelograms were deemed to be normal or equivocal.

Lumbar discography was performed by Gardner's method as described in Collis' monograph.1 The L-3, L-4, and L-5 discs were injected in all patients. The early procedures were performed on a regular x-ray table. The patient lay prone and flexed over two pillows placed under the hips. This was satisfactory, although later we built a special discogram table similar to Gardner's. It made insertion of the needles easier by increasing lumbar flexion, thereby separating the spinous processes to a greater degree. We modified Gardner's technique in one way, by injecting Novocaine directly into the disc. If the injection of contrast medium caused excessive pain, we found that this could be diminished by injecting ½ ml of 1% Novocaine through the same needle. The x-rays were taken first, however, so as to prevent the anesthetic from diluting the contrast medium. The procedure took about 45 minutes to complete. We found that the method was easy for the surgeon to learn, and relatively safe but quite painful for the patient.

One radiologist (W.M.) interpreted both the myelograms and discograms. He had no other information about the patients. For this series, discograms were read only as "protruded disc" or "not protruded." A diagnosis of protruded disc was made if the contrast medium outlined an obvious posterior bulge in the annulus fibrosis or if it escaped the confines of the posterior longitudinal ligament and spread along the epidural space.

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Discography in Lumbar Disc Protrusion

We interpreted the discogram chiefly from lateral films. The posteroanterior roentgenograms were usually unrewarding, and we took this projection only after the three lateral projections had been developed.

Results

Thirty-eight patients subsequently underwent surgery. There were 40 overt disc protrusions. Two patients each had two disc protrusions (Table 1). The comparative accuracy of the two diagnostic procedures was indicated by the fact that myelography and discography were of equal accuracy at the L-3 and L-4 interspaces whereas discography was considerably more accurate at the L-5 interspace (Table 2).

When diagnostic procedures indicated a disc protrusion but surgery revealed none, they were designated "false positive." The procedures were designated "false negative" when they showed no protrusion but surgery proved otherwise (Table 3). Discography was responsible for an interspace infection in at least one patient and possibly in three others. In one patient we performed discography before myelography. The myelography films were unforgettable. Pantopaque poured out of the holes made by the discogram needles and rendered the myelogram useless (Fig. 1).

Case Reports

The following characteristic case reports indicate the value of the judicious use of lumbar discography.

Case 1. Clinical examination indicated a questionable disc protrusion, with a normal myelogram.

A neurotic 36-year-old woman was admitted to the hospital for back pain. She quickly recovered and was readmitted 3 years later for a carpal-tunnel syndrome. The flexor retinaculum was divided. During her convalescence she again experienced back pain, this time with vague radiation into the distribution of the left sciatic nerve. There were no objective findings. A myelogram was normal (Fig. 2). This was followed by a discogram which was interpreted as revealing a disc protrusion at the L-5 interspace (Fig 3). Surgery confirmed this diagnosis, and the patient was relieved of pain.

Case 2. Clinical examination indicated a disc protrusion at the L-5 interspace. The myelogram showed a disc protrusion at L-4.

![Fig. 1. Myelogram is useless if performed after discogram.](image-url)