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Clinical Study

Similar outcome despite slight clinical differences between lumbar radiculopathy induced by lateral versus medial disc herniations in patients without previous foraminal stenosis: a prospective cohort study with 1-year follow-up

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Abstract

BACKGROUND CONTEXT: It has been claimed that lumbar radiculopathy induced by foraminal disc herniations had poorer outcome and different clinical features, including: 1-more progressive onset, but shorter duration between the first sign and request of medical care; 2-more severe radiculopathy; 3-less frequent/severe back pain; 4-less limitation of straight leg raising (SLR); 5-more frequent neurologic deficiencies; 6-poorer outcome.

PURPOSE: To check whether this still holds true when including only patients without other reasons for foraminal stenosis, that is, whether patients with medial disc herniations had different features and outcome than those with more lateral disc herniations.

STUDY DESIGN: All patients hospitalized to treat a lumbar radiculopathy within a 6-month period in two French rheumatology units in 2012 were included in this prospective study each time computed tomography scan or magnetic resonance imaging had already been performed and showed clear disc bulging/herniation but no features of medial or lateral spinal stenosis.

PATIENT SAMPLE: Fifty-nine patients (31 males, 49 with sciatica only) were included: 31 (53%) had medial disc herniations and 28 (47%) had more lateral herniations (posterolateral in 3, foraminal in 20, and far lateral in 5).

OUTCOME MEASURES: Outcome was assessed by a phone call 1 year after the baseline assessment using a standardized questionnaire. Patients were asked whether they experienced a relapse of their radiculopathy after discharge from the hospital; whether they had been operated or not; whether they felt it had improved or not; whether they felt cured or not; to assess their level of pain radiating in the leg when standing on a 0 to 10 verbal scale; and how long they could walk.

METHODS: Features of patients with medial disc herniations were compared with patients with more lateral herniations.

RESULTS: No significant differences according to the location of herniations were noticed for the speed of radiculopathy onset, time elapsed since onset, back pain (both lying or standing), and leg pain (both lying or standing), but slight significant differences (t test<0.05) were observed for other items: the 28 patients with lateral herniations were 8 years older (53.4 $\pm$15.8 vs. 45.2$\pm$12.6), their herniations involved discs from upper levels of the lumbar spine (above L4–L5: 7/28 vs. 3/31), motor weakness was more frequent (25% vs. 3%), SLR was less restricted (65.0°$\pm$24.5° vs. 51.1°$\pm$25.7°), DN4 score of neuropathic pain was higher (4.4$\pm$2.1 vs. 3.2$\pm$1.8), anxiety level was higher (10.3$\pm$4.1 vs. 7.9$\pm$3.2), length of hospital stay was longer (5.7$\pm$2.4 days vs. 4.5$\pm$1.4 days), and physician's prognosis of a good outcome was poorer (6.6$\pm$2.2 vs. 8.0$\pm$1.6). However, at the end of follow-up (12.2$\pm$3.3 months), outcome was similar: 37% (vs. 41% for medial herniations) had transiently relapsed, 66% felt finally improved (vs. 63%), and walking capacity was nearly identical despite the fact that only 18% had to be operated (vs. 32% of those with medial herniations).

FDA device/drug status: Not applicable.

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CONCLUSIONS: Despite differences in clinical presentation, the outcome of radiculopathy induced by the more lateral lumbar disc herniations was not worse than the outcome of patients with only medial disc herniations. Previous claims of poorer outcome in foraminal herniations might be explained by the inclusion of patients with associated foraminal stenosis.

Keywords: Disc; Herniation; Medial; Lateral; Foraminal; Radiculopathy; Sciatica; Outcome; Prognosis; Surgery

Introduction

Many spine surgeons and other physicians believe that lumbar radiculopathy induced by lateral disc herniations (ie, from posterolateral to foraminal and far lateral disc herniations) has different clinical features from lumbar radiculopathy induced by medial disc herniations. These differences include more progressive onset and shorter duration between the first sign and request of medical care [1], more severe radiculopathy [2,3], less frequent/severe back pain [2,4,5], less limitation of straight leg raising (SLR) (in patients with sciatica) [2,4–6], more frequent neurologic deficiencies [2,4–6], more frequent limping [1], and older age [6]. Also, it has been claimed that patients with lateral (ie, from posterolateral to foraminal and far lateral disc herniations [Figure]) might have poorer outcome [1,7]. We sought to find out if this still holds true when considering only patients without other causes of foraminal stenosis. That is, we sought to study patients without a history of either medial or lateral spinal stenosis. We hypothesized that many of the abovementioned features, ascribed to lateral disc herniations, are related more to the worsening of preexisting foraminal stenosis than to the disc herniation itself.

Participants and methods

Participants suffering from lumbar radiculopathy and hospitalized from May 2011 to April 2012 in two rheumatology units were evaluated for inclusion in this prospective follow-up study. Inclusion criteria were definitive diagnosis of lumbar radiculopathy with typical pain radiating below the knee, associated either with neurologic signs (sensitivity, motor, and reflex) or with positive stretch signs (SLR test, Lasègue sign, and femoral stretch test); clear, bulging herniation of a single disc observed on a computed tomography (CT) scan or magnetic resonance imaging (MRI) that might account for the radiculopathy; exclusion of other conditions, such as tumors or infections that could also induce sciatica or femoral nerve pain; absence of either medial or lateral spinal stenosis according to the Lee criteria for foraminal stenosis [8]; and absence of anterolisthesis or retrolisthesis [9].

Participants were asked on presentation to provide informed consent, agree to complete baseline questionnaires, and be available later on for follow-up. The standard of care for lumbar radiculopathy that included administering pain relievers and one to three peridural injections of 5 ml of a solution containing 125 mg of prednisolone acetate, depending on easing of radiculopathy, remained unchanged and was similar between the two units. All participants benefited from education and physical therapy during their initial stay in our medical units before discharge.

To prevent bias in choosing between medical and surgical management, participants were not informed that one aim of the study was to compare the outcome of their radiculopathy according to the location of their disc herniation, and the surgeons remained unaware that participants had previously completed the questionnaires. For each participant, the same rheumatology fellows in the two units (OM) completed baseline questionnaires and recorded numerous parameters on demographic information, description of the history of and the treatment for past and present radiculopathies, magnitude of leg and back pain, and results of neurologic and muscle tests (Table). Lasègue test was defined as positive if the examiner observed production of pain with a typically dermatomal pattern of distribution and pelvic muscle resistance during unilateral provocative SLR below an angle of 60°. Crossed SLR was defined as positive if the examiner observed the production of pain with a typically dermatomal pattern of distribution and pelvic muscle resistance when the other leg was raised below 90°. Last, patients fulfilled three scores: the DN4 score of neuropathic pain [10], the French translation of Roland Disability Questionnaire adapted for radiculopathy (EIFEL score) [11], and the Hospital Anxiety and Depression Scale [12]. Both physician and patients expressed their prognosis on the ongoing radiculopathy on a 0 (very poor prognosis) to 10 (very good prognosis and no need for surgery) analog scale.

At the beginning of the study, disc herniations noted on a CT scan or on an MRI were classified either as medial, posterolateral (subarticular), foraminal, or lateral (Figure) according to classifications of Li et al. [13] and Lee et al. [7]. A repeatability assessment was not performed by other physicians, but all classifications were done by the same person who trained with senior rheumatologist (J-MB) by using the Figure, so as to be as consistent as possible.

For comparisons, participants were separated into two groups: those with medial herniations and those with posterolateral (subarticular), foraminal, and lateral herniations, as already suggested [14].