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Clinical Study

Recovery of motor deficit accompanying sciatica—subgroup analysis of a randomized controlled trial

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Abstract

BACKGROUND CONTEXT: In patients with sciatica due to a lumbar disc herniation, it is generally recommended to reserve surgical treatment for those who suffer from intolerable pain or those who demonstrate persistent symptoms after conservative management. Controversy exists about the necessity of early surgical intervention for those patients that have an additional motor deficit.

PURPOSE: The aim of this study was to compare the recovery of motor deficit among patients receiving early surgery to those receiving prolonged conservative treatment.

STUDY DESIGN: Subgroup analysis of a randomized controlled trial.

PATIENT SAMPLE: This subgroup analysis focuses on 150 (53%) of 283 patients with sciatica due to a lumbar disc herniation and whose symptoms at baseline (before randomization) were accompanied by a motor deficit.

OUTCOME MEASURES: Motor deficit was assessed through manual muscle testing and graded according to the Medical Research Council (MRC) scale.

METHODS: In total, 150 patients with 6 to 12 weeks of sciatica due to a lumbar disc herniation and whose symptoms were accompanied by a moderate (MRC Grade 4) or severe (MRC Grade 3) motor deficit were randomly allocated to early surgery or prolonged conservative treatment. Repeated standardized neurologic examinations were performed at baseline and at 8, 26, and 52 weeks after randomization. This study was supported by a grant from the Netherlands Organization for Health Research and Development (ZonMW) and the Hoelen Foundation The Hague.

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The disclosure key can be found on the Table of Contents and at www.TheSpineJournalOnline.com.

All authors listed above had full access to all the data (including statistical reports and tables) in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis. GMO and WCP are guarantors of this article.

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Written informed consent was obtained from *all patients*. The medical ethics committees at the Leiden University Medical Center and the participating hospitals all approved the study protocol.

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RESULTS: Sciatica recovered among seven (10%) of the 70 patients assigned to early surgery before surgery could be performed, and of the 80 patients assigned to conservative treatment, 32 patients (40%) were treated surgically because of intolerable pain. Baseline severity of motor deficit was graded moderate in 84% of patients and severe in 16% of patients. Motor deficit recovered significantly faster among patients allocated to early surgery (p=.01), but the difference was no longer significant at 26 (p=.21) or 52 weeks (p=.92). At 1 year, complete recovery of motor deficit was found in 81% of patients allocated to early surgery and in 80% of patients allocated to prolonged conservative treatment. Perceived overall recovery of sciatica was directly related to the presence of an accompanying motor deficit. Severe motor deficit at baseline (odds ratio, 5.4; confidence interval, 1.7–17.4) and a lumbar disc herniation encompassing ≥25% of the cross-sectional area of the spinal canal (odds ratio, 6.4; confidence interval, 1.3–31.8) were the most important risk factors for persistent deficit at 1 year.

CONCLUSIONS: Early surgery resulted in a faster recovery of motor deficit accompanying sciatica compared with prolonged conservative treatment but the difference was no longer significant during the final follow-up examination at 1 year.

Keywords: Lumbar; Herniated disc; Motor deficit; Paresis; Recovery

Introduction

Typically, symptoms of sciatica consist of unilateral radicular leg pain. The most frequent cause of sciatica is lumbar disc herniation [1]. Among randomized controlled trials comparing the effectiveness of surgery to conservative treatment, surgery favored a better short-term recovery of sciatica compared with conservative management [2–7]. Four of these trials reported no significant or clinically relevant difference of long-term recovery of sciatica [2–5,7]. Therefore, it is generally recommended to reserve surgical treatment for cases with intolerable pain or persistent symptoms refractory to conservative management [8].

Controversy exists about the necessity of surgical intervention and timing of surgery for lumbar disc herniation accompanied by motor deficit. Radicular pain can be accompanied by motor deficits of varying severity. Motor deficits are found in 40% to 82% of cases of lumbar disc herniation [2–4,6,9–11]. A recent survey among spine surgeons demonstrated that the majority of surgeons preferred surgical treatment in the presence of motor deficit and were more likely to opt for surgery in case of severe or short-lived motor deficit [12]. Clear evidence for this approach is lacking. Recovery of motor deficit was reported in two randomized controlled trials [3,10], but neither of these trials demonstrated a significant difference between patients treated surgically and patients receiving conservative treatment. However, it must be noted that both trials have methodological shortcomings limiting their generalizability. In particular, Weber [10] does not elucidate how the presence or severity of motor deficit influenced the selection of patients for randomization, and Buttermann [3] reported no detail of the severity of motor deficit or involved muscles groups. Our study compares the recovery of motor deficit among patients randomly allocated to early surgery or prolonged conservative treatment and evaluates the clinical significance of motor deficit accompanying sciatica. Secondary aims are to identify factors associated with persistent motor deficit at final follow-up. For this purpose, a subgroup analysis of the Sciatica trial [2] was performed. Although this trial was originally designed to compare the efficacy of early surgery versus prolonged conservative treatment in patients with sciatica due to a lumber disc herniation, it also included patients whose symptoms were accompanied by moderate (Medical Research Council [MRC] Grade 4) and severe (MRC Grade 3) motor deficit. Because the subset of patients for this study is defined in terms of properties defined before randomization, this subset in itself has the structure of a randomized clinical trial.

Methods

Study design

The present study comprises a subgroup analysis of a multicenter, prospective, randomized trial among patients with 6 to 12 weeks of severe sciatica. Details of the design and study protocol have been published previously [13]. Originally, the outcomes of 141 patients allocated to early surgery and 142 patients allocated to prolonged conservative treatment were compared. This subgroup analysis focuses on 150 (53%) of 283 patients whose symptoms at baseline (before randomization) were accompanied by motor deficit.

Patient population

Eligible patients consisted of patients 18 to 65 years presenting to the neurologist with sciatica due to a lumbar disc herniation persisting 6 to 12 weeks. Lumbar disc herniation was radiologically confirmed with magnetic resonance imaging (MRI) and symptom severity justified surgical treatment as evaluated by the neurosurgeon. Motor deficit was assessed through manual muscle testing and graded according to the MRC scale [14]. Patients were excluded in case of presenting with cauda equine syndrome or very severe

(MRC ≤2) or rapidly progressing motor deficit. Other exclusion criteria consisted of having a similar episode of sciatica during the previous 12 months, severe co-morbidity, previous spine surgery or concomitant spinal stenosis, or deformity. In the current analysis, only patients with sciatica accompanied by motor deficits were included. Motor deficits varied from moderate (MRC Grade 4) to severe (MRC Grade 3).

Study interventions

Surgery was scheduled within 2 weeks after randomization and was canceled only in case of spontaneous improvement of symptoms. Conservative treatment was provided by the general practitioner. Patients received information about their condition and were advised to continue activities of daily living. If deemed necessary, analgesics were prescribed or guidance from a physical therapist was recommended. In case disabling sciatica persisted for 6 months after the patient was randomized for conservative treatment, surgery was offered. Increasing leg pain refractory to analgesics and progressive neurologic deficit were indications to perform surgery earlier than 6 months.

Study measures

Repeated standardized neurologic examinations were performed at baseline and at 8, 26, and 52 weeks by independent research nurses. During these outpatient visits, muscle strength was evaluated in the tibialis anterior, extensor hallucis longus, and triceps surae muscle (groups) of both lower extremities. Recovery of motor deficit was defined as a recovery from a MRC Grade 3 or 4 to a MRC Grade 5 motor deficit. Potential demographic, clinical, and radiological predictors for persistent motor deficit were evaluated (Table 1).

As part of routine preoperative assessment, all patients underwent MRI imaging. Two neuroradiologists and a neurosurgeon independently performed a standardized evaluation. Images were evaluated according to the recommendations from the combined task forces of the North American Spine Society, the American Society of Spine Radiology, and the American Society of Neuroradiology for classification of lumbar disc pathology [15]. Protrusion was defined as a localized displacement of disc material beyond the intervertebral disc space, with the base against the disc of origin broader than any other dimension of the protrusion. Extrusions were characterized by a narrower base against the disc of origin, narrower than any other dimension of the herniated disc measured in the same plane, or when no continuity existed between the disc material beyond the disc space and that within the disc space. The axial lumbar disc herniation occupancy was measured within the bony surrounding of the spinal canal, thus excluding the ligamentum flavum. The axial localization of herniated discs was classified as central, paramedial, lateral recess or (extra) foraminal.

EVIDENCE & METHODS

Context
Whether urgent surgery is warranted for patients with lumbar disc herniations and motor weakness is unclear. The authors present their findings from an RCT.

Contribution
The authors found that early surgery resulted in faster motor recovery but that by one year the nonoperatively treated patients regained function equally. Severe motor deficit and canal compromise greater than 25% negatively impacted recovery.

Implications
The findings are helpful for informed consent. It is important to note that both the intent-to-treat and as-treated analyses found similar results despite the fact that crossover was 40% in the nonoperative group and patients with more severe deficits often underwent delayed surgery.

—The Editors

Statistical analysis

Differences between groups at baseline were assessed by comparing means, or percentages, depending on the type of variable. The frequency of motor deficit among treatment groups was analyzed with a generalized estimating equations repeated measures analysis using the identity link function and an unstructured working correlation matrix to allow for the correct modeling of within-patient correlation of repeated manual muscle testing during consecutive follow-up moments. Means and 95% confidence intervals (CIs) were calculated for each consecutive follow-up moment using a model with treatment and time as covariates. Likewise, means and corresponding 95% CIs of functional disability scores and leg pain were point-wise estimates derived from a mixed model repeated measures analysis. To evaluate potential predictors for persistent motor deficit at final follow-up, a forward stepwise logistic regression analysis was performed. Means were compared using a *t* test or a general linear model was used in case comparisons were adjusted. Data collection and quality checks were performed with the ProMISe web-based secure data management system of the Department of Medical Statistics and Bioinformatics of Leiden University Medical Center. For all statistical analyses, SPSS version 19.0 was used.

Results

Symptoms of 150 patients were accompanied by a motor deficit MRC Grade 3 or 4. No statistical differences were found between baseline characteristics of both randomization groups (Table 1). The distribution of motor

Table 1
Baseline characteristics

Characteristic	Allocated to early surgery (N=70)	Allocated to conservative treatment (N=80)
Age (y)	42.9±9.3	44.3±9.9
≥50 Years	15 (21)	24 (30)
Sex—male	41 (59)	47 (59)
Body mass index	26.1±4.3	25.5±3.0
Duration of sciatica	9.2±2.6	9.4±2.1
Preference for conservative treatment	15 (21)	21 (26)
Time to surgery (wk)	1.8±0.9	15.1±13.0*
Pain on SLR—≤60°	54 (79)	63 (80)
Finger floor distance—>25 cm	44 (63)	56 (73)
Trendelenburg sign	23 (35)	27 (35)
Unable to walk on heels	29 (42)	34 (43)
Unable to walk on toes	26 (38)	25 (32)
Asymmetrical knee jerk	27 (39)	18 (23)
Asymmetrical ankle jerk	26 (38)	30 (39)
Dermatome hypoesthesia	53 (77)	68 (86)
Motor deficit MRC 4	57 (81)	69 (86)
Motor deficit MRC 3	13 (19)	11 (14)
MRI evaluation findings		
Level L3–L4	4 (6)	3 (4)
Level L4–L5	33 (47)	40 (50)
Level L5–S1	33 (47)	37 (46)
Protruded disc	26 (36)	27 (33)
Extruded disc	44 (64)	53 (67)
Axial cross-section area ≥25%	48 (69)	64 (80)
Axial localization: central	3 (4)	2 (3)
Axial localization: paramedial	50 (71)	59 (74)
Axial localization: lateral recess	12 (17)	12 (15)
Axial localization: (extra) foraminal	5 (7)	7 (9)
Roland disability questionnaire score†	17.1±3.8	16.7±3.8
VAS leg‡	72.2±18.3	65.5±21.0
VAS back‡	34.7±30.34	34.7±26.3

SLR, straight leg raising test; MRC, Medical Research Council; MRI, magnetic resonance imaging; VAS, visual analog scale.

Values are numbers (percentages) of patients or means±standard deviations.

* Time to surgery among the 32 crossover cases.

† The modified Roland disability questionnaire for sciatica is a disease-specific disability scale that measures functional status in patients with pain in the leg or back. Scores range from 0 to 23, with higher scores indicating worse functional status.

‡ The intensity of pain was indicated on a 100-mm VAS, with 0 representing no pain and 100 the worst pain ever experienced.

deficit among muscle groups is presented in Table 2. Sciatica recovered among seven (10%) of the 70 patients assigned to early surgery before surgery could be performed. On average, early surgery was performed 1.8 weeks (95% CI, 0.9–2.7) after randomization. Of the 80 patients assigned to conservative treatment, 32 patients (40%) were treated surgically because of intolerable pain. Delayed surgery was performed after a mean period of 15.1 weeks (95% CI, 2–28). In one case, motor deficit progressed from MRC Grade 4 to MRC Grade 3 before delayed surgery. Two patients were lost to follow-up early. Both patients were allocated to conservative treatment. Missing data of neurologic examination and questionnaires did not exceed 10% at any follow-up moment.

Motor deficit severity

Severity of motor deficit at baseline was graded moderate (MRC 4) in 126 patients (84%) and severe (MRC 3) in 24 patients (16%). The final follow-up examination at 1 year included 64 patients (91%) allocated to early surgery and 75 patients (94%) allocated to conservative treatment. Motor deficit severity was significantly related to the extent of crossover in the group allocated to conservative treatment (p=.023, Fischer exact test), as 24 subjects (35%) with moderate motor deficit underwent surgery compared with eight (73%) with severe motor deficit. The recovery of motor deficit by severity and treatment is provided in Table 3. Recovery of motor deficit was inversely related to the preoperative severity of motor deficit during all consecutive follow-up examinations among both randomization groups (p=.024, repeated measures analysis).

Motor deficit by treatment over time

The recovery of motor deficit among both randomization groups had different courses over time. Motor deficit recovered significantly faster among patients allocated to early surgery. The difference was no longer significant at 26 weeks or at the final follow-up examination at 1 year (Fig. 1). Additionally, an as-treated analysis was performed to assess the influence of crossover between randomization groups. Results from this analysis according to the treatment actually received did not differ from the intention-to-treat analysis (Fig. 1).

Functional disability, leg pain, and perceived recovery

Functional disability score, leg pain, and perceived recovery of patients with persistent motor deficit differed significantly from patients without motor deficit during all consecutive follow-up moments (Fig. 2).

Table 2
Motor deficit severity subdivided by muscle group

Muscle group	Early surgery, N=70 (%)	Conservative treatment, N=80 (%)	MRC 4	MRC 3
Tibialis anterior muscle	49 (70)	55 (69)	82	22
Extensor hallucis longus muscle	57 (83)	67 (84)	101	23
Triceps surae muscle	45 (64)	46 (59)	72	19

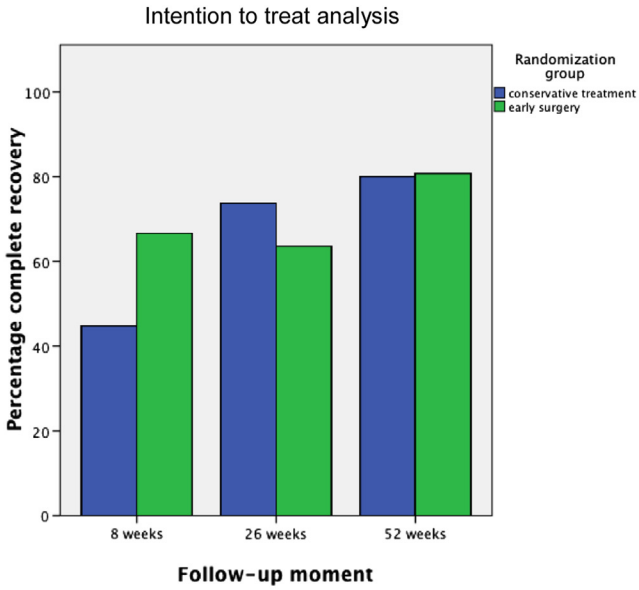
MRC, Medical Research Council.

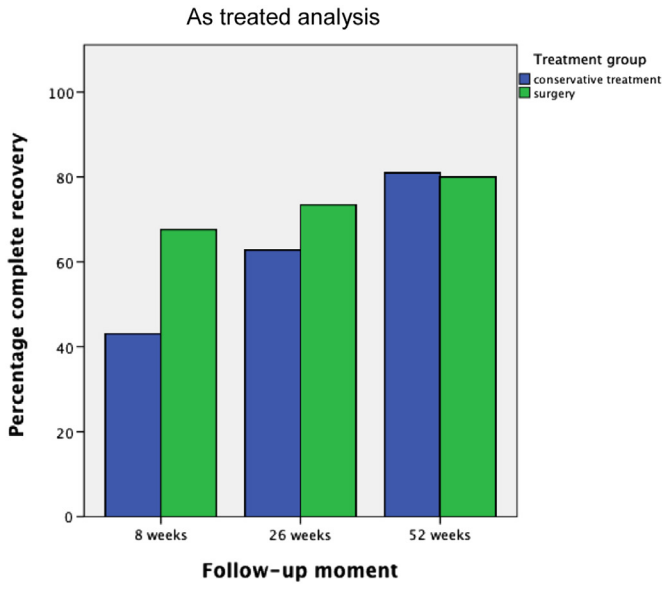
Table 3
Frequencies and severity of motor deficit among randomization groups and associated crossover cases

Randomization group	MRC 4 at baseline (%)	MRC 3 at baseline (%)	MRC 4 recovered at final follow-up (%)	MRC 3 recovered at final follow-up (%)
Early surgery group	**57 (81)**	**13 (19)**	**45 (87)**	**7 (58)**
Early surgery	51 (73)	12 (17)	40 (85)	6 (54)
Crossover cases	6 (8)	1 (2)	5 (100)	1 (100)
Conservative treatment group	**69 (86)**	**11 (14)**	**56 (84)**	**4 (50)**
Conservative treatment	45 (56)	3 (4)	35 (81)	2 (100)
Crossover cases	24 (30)	8 (10)	21 (87)	2 (33)

MRC, Medical Research Council.
Percentages shown are valid percentages; the proportion of patients with measurements available at final follow-up. Bold values, randomization group.

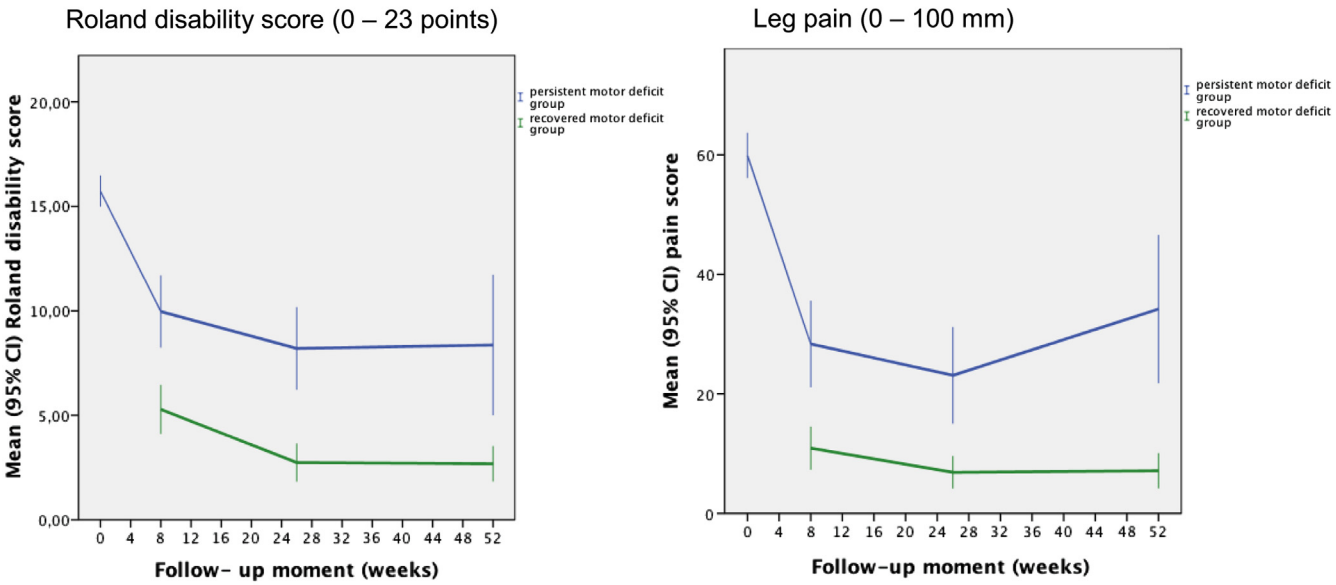
Mean Roland disability questionnaire (RDQ) scores and visual analog scale (VAS) leg pain scores at 1 year were 8.6 and 33.7, respectively, in patients with motor deficit compared with 2.9 and 7.2, respectively, in patients without motor deficit (p=.001, generalized linear model, adjusted for the baseline value of RDQ and VAS score). Complete or near complete recovery was reported by 46.4% of patients with persistent motor deficit compared with 90.1% of patients without motor deficit at 1 year (p=.001, generalized linear model, adjusted for baseline value of 7-point Likert





	8 weeks	26 weeks	52 weeks
Intention to treat analysis			
early surgery	67 (55 to 79)	64 (52 to 75)	81 (71 to 90)
conservative treatment	44 (33 to 56)	74 (64 to 83)	80 (71 to 89)
mean difference	**23 (6 to 39)***	10 (-6 to 25)	1 (-12 to 14)
As treated analysis			
surgery	68 (56 to 79)	74 (64 to 83)	80 (71 to 88)
conservative treatment	43 (31 to 54)	62 (51 to 74)	81 (71 to 91)
mean difference	**25 (9 to 41)***	11 (-4 to 26)	1 (-12 to 14)

Fig. 1. Recovery of motor deficit during consecutive follow-up moments. Repeated measures analysis mean percentages and 95% confidence intervals of patients with complete recovery of motor deficit. Percentages are point-wise estimates derived from the repeated measures analysis. *p≤.05.



	8 weeks	26 weeks	52 weeks
Roland disability score[1]			
recovered motor deficit group	5.8 (4.7 to 6.9)	3.3 (2.3 to 4.3)	2.8 (1.8 to 3.7)
persistent motor deficit group	9.3 (8.1 to 10.6)	7.4 (6.0 to 8.8)	7.7 (5.7 to 9.7)
mean difference	**3.6 (2.0 to 5.1)***	**4.1 (2.4 to 5.7)***	**4.9 (2.7 to 7.0)***
VAS leg pain[2]			
recovered motor deficit group	11.5 (6.9 to 16.2)	7.1 (2.9 to 11.2)	7.4 (3.6 to 11.3)
persistent motor deficit group	27.3 (22.2 to 32.5)	23.0 (16.8 to 29.3)	32.6 (24.7 to 40.6)
mean difference	**15.8 (9.1 to 22.6)***	**16.0 (8.6 to 23.3)***	**25.2 (16.4 to 34.0)***
Satisfactory overall recovery[3] (percentage)			
recovered motor deficit group	69.9 (61.9 to 78.0)	80.2 (73.0 to 87.3)	89.7 (83.0 to 96.4)
persistent motor deficit group	40.8 (32.0 to 49.7)	46.6 (35.9 to 57.4)	49.0 (35.3 to 62.7)
mean difference	**29.1 (17.5 to 40.7)***	**33.5 (20.9 to 46.2)***	**40.7 (25.6 to 55.8)***

Fig. 2. Functional disability, leg pain, and perceived overall recovery of patients with and without recovery of motor deficit. Repeated measures analysis mean scores and 95% confidence intervals for Roland disability score and VAS for leg pain and perceived overall recovery. All patients have an accompanying motor deficit at baseline, the comparisons are at 8, 26, and 52 weeks. [1]Roland disability questionnaire for sciatica. Scores range from 0 to 23, with higher scores representing worse disability. [2]VAS: visual analogue scale. Measured on 100 mm scale, with 0 representing no pain and 100 the worst pain ever experienced. [3]"Complete" and "near complete recovery" on 7-point Likert scale of global perceived recovery. *p≤.05.

scale for recovery). After adjusting for leg pain, patients with persistent motor deficit at 1 year had a mean RDQ score of 5.3 compared with 3.5 in patients without persistent motor deficit (p=.08, generalized linear model). The perceived recovery remained greater in the group without persistent motor deficit, being 84.9% complete or near complete recovery compared with 69.1% in the group of patients with persistent motor deficit (p=.03, generalized linear model).

Risk factors for persistent motor deficit

Severe motor deficit (MRC 3) at baseline examination (odds ratio, 5.4; CI, 1.7–17.4) and a lumbar disc herniation encompassing ≥25% of the cross-sectional area of the spinal canal (odds ratio, 6.4; CI, 1.3–31.8) were the most important independent risk factors for persistent motor deficit at 1 year. No other physical examination findings, aspects of MRI evaluation, or demographic characteristics listed

Table 4
Multivariate analysis for persistent motor deficit at 1 year of follow-up

Characteristic	Odds ratio	95% Confidence level
Severe weakness (MRC 3)	**5.4***	**1.7–17.4**
≥25% Occupancy HNP	**6.4***	**1.3–31.8**
Sex—female	2.0	0.8–5.0
Age ≥50 years	1.6	0.6–4.6
Early surgery	Reference category	
Secondary surgery	1.0	0.3–3.3
Conservative treatment	0.8	0.3–2.5

MRC, Medical Research Council; HNP, herniated nucleus pulposus; Bold values, randomization group.
* p≤.05.

in Table 1 were significantly associated with motor deficit at the final follow-up visit (Table 4). The mean duration of motor deficit until surgery was not significantly different between patients who recovered completely (10.7 weeks) and those with persistent motor deficit (11.8 weeks) at final follow-up (p=.223, *t* test).

Discussion

This study demonstrates not only patients receiving early surgery present faster recovery of motor deficit but also that the 1-year recovery of motor deficit does not differ among patients randomly allocated to early surgery or prolonged conservative treatment. After 1 year of follow-up, 90% of the patients allocated to early surgery underwent a microdiscectomy compared with 40% of the patients allocated to prolonged conservative treatment. Although both randomization groups showed similar recovery of motor deficit after 1 year of follow-up, the advantage of offering early surgery is faster recovery of motor deficit. Previously, we demonstrated the same to be true for the recovery of leg pain, functional disability, and perceived recovery, including patients with moderate and severe motor deficit [2,7]. In this study, the clinical significance of motor deficit in particular is demonstrated by its relation with perceived overall recovery of sciatica. Functional disability and perceived recovery were directly related to recovery of motor deficit, but leg pain was also greater among patients with persistent motor deficit. Therefore, one should be careful to imply that persistent motor deficit results in worse functional disability and perceived recovery [16,17], as this can be confounded by persistent leg pain. However, after adjusting for leg pain, perceived recovery was still significantly greater in patients without persistent motor deficit than in patients with persistent motor deficit at final follow-up. The difference between functional disability scores did not reach statistical significance.

We observed complete recovery of motor deficit in 85% of patients with a moderate motor deficit at baseline, compared with only 55% of patients with a severe motor deficit. In accordance with the authors of previous studies [16–21], we conclude that the degree of recovery of motor deficit was inversely related to the preoperative severity of motor deficit. This is of particular importance in case of a progressive motor deficit and must urge immediate surgery. The percentage lumbar disc herniation occupancy of the cross-sectional area of the spinal canal was the strongest independent predictor for persistent motor deficit at 1-year of follow-up. Extruded or sequestrated herniations have previously been associated with the persistence of motor deficit but were no risk factors in this study [16,21–23]. Different definitions of extruded and sequestrated discs may have caused this discrepancy. Timing of surgery was no risk factor for persistent motor deficit in our study. Recovery of motor deficit did not differ among patients who underwent surgery after a mean of 2 weeks, 15 weeks, or no surgery at all, nor did the duration of motor deficit until surgery differ between patients who recovered completely and those with persistent motor deficit. Previous conclusions regarding the timing of surgery are conflicting. Postacchini et al. [16] and Aono et al. [18] found a significant relation between duration of motor deficit and recovery, whereas others did not [19–22,24]. Comparison of these results is difficult as time from onset of motor deficit until surgery varied considerably between studies. Furthermore, the evaluation of preoperative duration of motor deficit cannot be assessed reliably because patients are often unaware of their motor deficit and severe radicular pain may influence patient's perception of motor deficit.

Our findings are consistent with the findings of the randomized controlled trial performed by Buttermann [3]. Among patients randomly allocated to surgery or epidural steroid injections, motor deficit recovered significantly faster among surgically treated patients, but the difference was no longer significant during the follow-up examinations past 3 months. Similar to our study, the randomized controlled trials by Buttermann and Weber and an observational study by Dubourg et al. reported no advantage of surgical treatment for the persistence of motor deficit at final follow-up [3,10,22]. Intervals between onset of neurologic deficits and surgery as small as 48 hours have shown to improve neurologic outcome, including motor deficits, in cauda equine syndrome [25]. None of the aforementioned studies, including ours, have included patients with similar short-lived motor deficit. Therefore, immediate surgery for short-lived very severe motor deficit or complete paralysis still seems appropriate.

The generalizability of our findings is subject to several limitations. Most importantly, our study does not include patients with very severe motor deficit (MRC ≤2) or complete paralysis. Furthermore, considerable crossover occurred among patients with severe motor deficit allocated to conservative treatment. Although the evaluation of these patients is of utmost clinical relevance, randomization of these patients is difficult due to patient's and doctor's preferences for treatment. Second, manual muscle testing depends on the subjective rating of motor deficit. Although this technique is widely used in clinical practice, it has been

criticized for lacking sensitivity and reliability. Compared with manual muscle testing, a quantitative isometric assessment of motor deficit is more sensitive to the smaller deficit and able to detect persistent deficit not detected with manual muscle testing [26,27]. The reliability is also influenced by persistent leg radicular pain, which may impede patients to exert maximum force during evaluation.

Conclusion

Motor deficit accompanying sciatica recovered significantly faster among patients allocated to early surgery, but the difference was no longer significant during the follow-up examinations at 26 or 52 weeks. The clinical significance of motor deficit accompanying sciatica is demonstrated, as patients without persistent motor deficit perceive greater overall recovery than patients with persistent motor deficit at final follow-up. This implicates that the role of early surgery is to accelerate the recovery of motor deficit and the overall perceived recovery of sciatica. Timing of surgery was no risk factor for persistent motor deficit in our study, but definite conclusions are limited as our study did not include patients with intervals between onset of motor deficit and surgery of less than 8 weeks or patients with very severe motor deficit or complete paralysis. Future studies are necessary to address these subgroups.

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