

DURATION OF DISABILITY FOLLOWING LUMBAR DISC SURGERY

VALDEMAR V. SURIN

Department of Orthopaedic Surgery, Borås Central Hospital, Sweden.

The total duration of disability of 116 patients operated on for lumbar disc prolapse was studied 10 years postoperatively. From the beginning of the observation period 10 years before surgery, the number of days on sick-leave increased continually and no positive effect of the surgical treatment in this respect could be observed. There was a highly significant coincidence between the end-result assessment by the patient and the total duration of the postoperative disability. The following factors were conducive to a short total period of postoperative disability: early surgery (short interval of preoperative sciatica), short total preoperative period of sick-leave and immediate relief of sciatic pain by the operation. The objective changes in the preoperative state of the patient such as neurological and X-ray findings had a less significant influence.

Key words: lumbar spine; disc prolapse; surgery; disability

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The goal of lumbar disc surgery is to relieve pain and disability. From this viewpoint, the long-term course of events as regards sick-leave following surgery is important. Whereas the factors connected with sick-leave in non-operated patients with low back disorders has been the subject of earlier investigations (Westrin 1973), the rare reports on sick-leave in patients operated on for lumbar disc prolapse are based on selected patient populations (Hakelius 1970). To the author's knowledge there are no earlier investigations dealing with the course of events as regards sick-leave in unselected patients operated on for lumbar disc prolapse.

PATIENTS AND METHODS

All patients operated on for suspected lumbar disc herniation during 1964 and 1965 were included in this retrospective study, thus ensuring an equal follow-up interval in all investigated patients.

A total of 140 patients were operated on and of this number 129 (92 per cent) could be assessed. This study was made during the year 1976 and the follow-up period thus ranged between 10 and 11 years. Thirteen patients who retired during the follow-up time were excluded from this part of the investigation, leaving 116 patients. The mean age of the patients at operation was 41.8 years and the ratio men:women was 2.1:1. The composition of our patient population in this respect compares with previous reports (Spangfort 1972).

The following data were evaluated for each patient: 1) From the medical case record: the patient's biographic data, the preoperative and postoperative course of low-back disorders, the

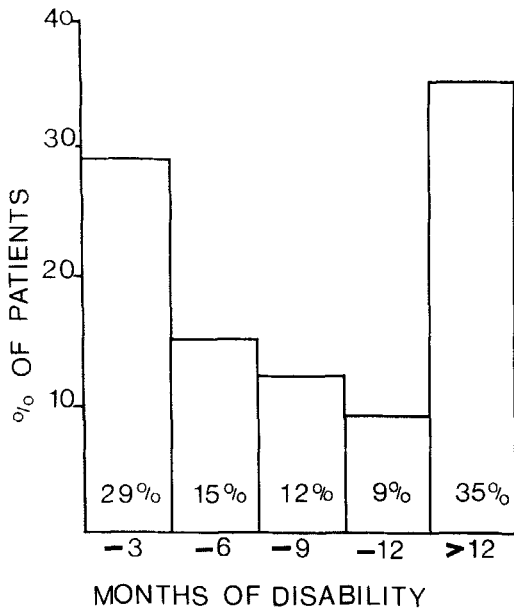


Figure 1. Distribution of 116 patients according to the total duration of postoperative disability.

clinical, X-ray and operative findings; 2) From the Health Insurance Office files: all periods of sick-leave for low back disorders between 1955 and April 1976; 3) From the questionnaire completed at the patient's interview: the evaluation of the whole postoperative course, especially in terms of residual symptoms and working capacity.

Some patients did not go to work at all after the operation, and the total period of disability (the sum of all postoperative sick-leave periods) was in these cases regarded as infinite. The presence of patients with an infinite disability time, and the fact that the total duration of disability was found to form a skewed distribution (Figure 1), invalidated the use of average duration of disability as a basis for comparison between the groups. Instead, the method of normal probability graphs (Amador & Hsi 1969) was used, separating the whole patient population into two groups according to the total duration of postoperative disability. The one group, characterized by a "normal" total duration of postoperative disability included 75 patients (65 per cent of the total population). The limits of the "normal" length of total postoperative disability ranged up to 1 year. In 41 patients (35 per cent of the population) this period of disability was longer than 1 year. These patients constituted the other group, classified throughout this paper under the heading "extended" total duration of disability.

A number of factors were tested against these two groups of patients. The comparison has been made as an item analysis with the different variables examined separately. The chi-square test was used as a test of independence between two categories of classification. The indications for the surgical treatment and the surgical technique were standard. As regards the length of the sick-leave period, only the time period during which the patient's working capacity was diminished, according to the Swedish Health Insurance Office files, was considered. The degree of incapacity (whole or one-half incapacity) was disregarded. Sick-leave spells shorter than 8 days were also included, despite the fact that medical certificates are not compulsory for such periods. Only diagnoses for low back disorders were considered.

RESULTS

The course of events as regards sick-leave for low-back troubles

In the group of 116 patients the total number of days spent on sick-leave for low back disorders was followed for 10 years before and 10 years after surgery (Figure 2). It is apparent that the number of days on sick-leave increases continually during the whole investigation period and that this is unaffected by surgical treatment. The same trend was also observed when only the number of sick-leave periods were investigated. On the other hand, the number of patients with severe recidivous sciatica necessitating hospitalization showed a decreasing trend, being 6 per cent of the whole patient population in the first postoperative year and diminishing subsequently to a constant level of 1 per cent of the whole patient population from the fifth postoperative year.

Preoperative factors influencing total duration of disability (TD)

a) *General characteristics of the patient:* The age and sex were without influence on the TDD. The patients with the "extended" TDD had more often other serious diseases in their past his-

Table 1. General characteristics of 116 patients related to the total duration of disability (TDD).

Factor	Per cent of patients in the group		Significance
	"Normal" TDD	"Extended" TDD	
Other diseases	24	43	$P < 0.05$
Heavy work	42	66	$P < 0.05$
Mean sum of preoperative sick-leave days	143	232	$P < 0.001$

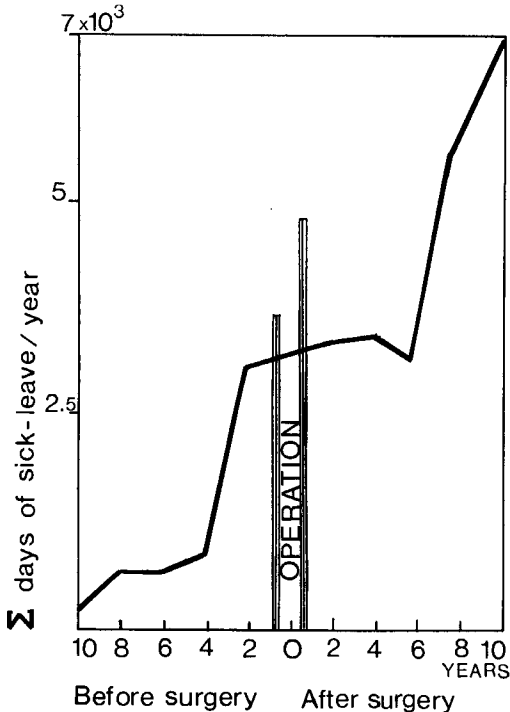


Figure 2. The sum of sick-leave days per year in all 116 patients. Variations during the 10 years before and the 10 years after surgery. Staples: sick-leave days immediately before and after surgery.

tory, did heavier work preoperatively and were more often and for a longer time on sick-leave for low back disorders during the 10 years prior to surgery (Table 1).

b) The duration of preoperative symptoms: We tried to differentiate between the past history of low back troubles and the duration of the sciatica bout immediately preceding surgery. By "past history" we mean the duration of symptoms from the first onset as opposed to

the defined period preoperatively during which the appearance or deterioration of sciatica developed, in spite of conservative treatment, until surgery was performed. All these estimations are based on autoanamnesic data.

The "long-term history" of low back troubles before operation was sometimes diffuse and any average duration of these troubles was therefore impossible to estimate. Instead the number of patients claiming not to have had previous low back disorders before operation (with the exception of the sciatica bout immediately preceding surgery) were estimated in both groups. It appeared that there were 30 per cent of these patients in the "normal" and 37 per cent in the "extended" TDD group, the difference being not significant. To assess the recall ability of these patients as regards low back disorders, the number of sick-leave spells for a diagnosis of low back disorder during the 10 preoperative years were studied. It appeared that out of 36 patients, 29 (80 per cent) had no such sick-leave spell, five had only one such spell shorter than 2 weeks and only two patients had repeated sick-leave periods totalling 230 days.

The duration of the sciatica bout immediately preceding surgery was stated very precisely by the patients. The mean duration of this sciatica period was 130 days in patients with "normal" and 300 days in patients with "extended" TDD, the difference here being highly significant ($P < 0.001$). Closer analysis revealed (Figure 3), that the TDD was directly proportional to the duration of

Table 2. Operative findings in 116 patients related to the total duration of disability (TDD).

Factor	Per cent of patients in the group		Significance
	"Normal" TDD	"Extended" TDD	
Complete disc prolapse	40	21	$P < 0.05$
Coincidence of estimated level of nerve root impairment and that found at operation	95	78	$P < 0.01$
Immediate relief of pain after surgery	52	17	$P < 0.001$

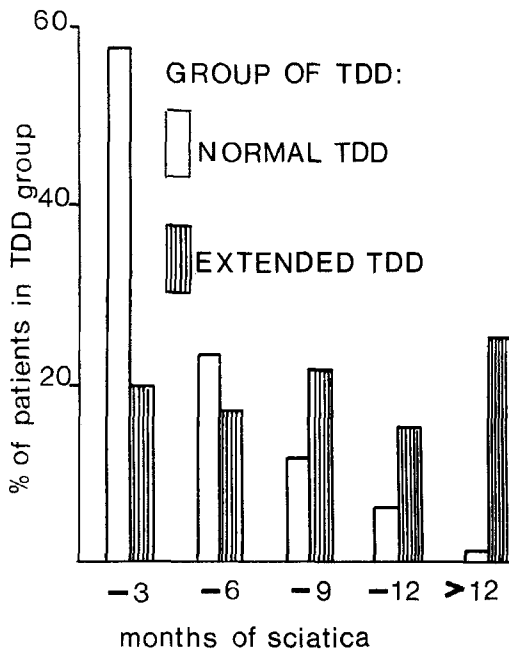


Figure 3. Distribution of the patient groups with "normal" and "extended" postoperative duration of disability according to the duration of preoperative sciatica.

immediate preoperative sciatica. It is also interesting to note that the patients operated early (duration of sciatica shorter than 3 months) have the best results when other evaluation criteria (subjective assessment) are considered.

c) The preoperative state and the X-ray findings: In the group with "normal" TDD 75 per cent of the patients had Laségue sign at 45° as compared with 41 per cent in the group with "extended"

TDD; the difference is significant ($P < 0.01$). The severity of nerve root impairment, the level and the side (right or left) of the prolapse were without prognostic significance. The presence and the degree of spondylosis and spondylarthrosis on preoperative X-rays of the lumbar spine were also without predictive value. Sixty-one per cent of the total patient population were myelographed. The myelographic pattern of dura indentation was present in 65 per cent of the myelographies of patients with "normal" and in only 36 per cent of the myelographies of patients with "extended" TDD; the difference is significant ($P < 0.05$).

d) The operative findings: The coincidence of the level of nerve root impairment, as estimated preoperatively, with the level found at surgery, the presence of complete disc prolapse and the immediate relief of sciatic pain after surgery are all important prognostic factors (Table 2).

The TDD correlated with the patient's estimation of the end-result

The patients assessment of the operative result 10 years after surgery coincides very well with the total duration of postoperative disability (Table 3), as was expected. But it is important to note in this regard that this coincidence was valid in our patient population only for the sum of all sick-leave periods over the 10 years of postoperative follow-up, while

the length of the solitary sick-leave spell, following immediately after surgery was without connection with the end-result.

Table 3. End results in 116 patients related to total duration of disability (TDD).

End-result assessment	Per cent of patients in the group	
	"Normal" TDD	"Extended" TDD
Completely satisfied	36	10
Improved but minor complaints:		
backache	39	17
leg pain	17	27
Dissatisfied	8	46
Total	100	100

DISCUSSION AND CONCLUSIONS

With a view to studying the differences in the course of events as regards disability time over a long period, the idea of "normal" and "extended" duration of disability following surgery was developed. The basic idea to separate a sample of sick individuals into two groups, the one classified as following a "normal", the other a "delayed" (in this case "extended") course of healing, is well known from the statistics of fracture healing. There is no apparent reason why this concept should not to be used to characterize the course of events as regards disability time following surgery for lumbar disc prolapse. The only problem in this respect is to define the range of normality. The simplest of indirect methods for estimation of normal range, using normal probability graphs, appeared to be fully appropriate to our study.

The reliability of a diagnosis of low back disorder collected from the Health Insurance Office files can be discussed with respect to the possibility that this covers other causes of work absence. Most authors (Beals & Hickman 1972,

Westrin 1973), however, consider it improbable that sick-leave because of low back disorder covers pure malingering. The high degree of correlation between the total duration of postoperative sick-leave and the patient's own assessment of the end-results reflects the fact that the patient himself controls the duration of disability.

The duration of preoperative symptoms as a prognostic factor in patients operated for lumbar disc prolapse is seldom mentioned and the statements in the published reports are very controversial. Hakelius (1970) found more favourable results in patients with less than 2 months duration of sciatica; Karaharju et al. (1974) noted less favourable results in these patients and Hirsch & Nachemson (1963) concluded that the end-results are not influenced by early (< 2 months) or late (> 6 months) surgery. According to Karaharju et al. (1974) there is no correlation between the duration of preoperative sciatica and late symptoms; Roslund (1974) found that preoperative sciatica of more than 8 months duration is a bad prognostic factor and Jackson (1971) noted that the incidence of late low back pain is directly related to the duration of preoperative symptoms. Our own experience from this study confirms the favourable prognosis of patients operated early. If the patient has symptoms and signs enough to warrant surgery, then he should be operated on without due respect to the short duration of sciatic symptoms.

The patients in our study who had protracted total duration of disability following surgery also had some traits in common in their preoperative history: They were more often sick in general, more often on sick-leave for low back troubles, and were usually doing heavy jobs. Their signs and symptoms of sciatica are not severe enough and consequently surgery is delayed.

When one considers why surgery fails in these patients, it must be remembered that a given patient's response to pain is very much a psychological phenomenon. Beals & Hickman (1972) found a close relationship between the psychological pattern of a patient with low back injury and the time which had elapsed since injury. As the time following the injury increases the patients tend to exaggerate their physical symptoms. Wiltse & Rocchio (1975) studying patients treated with chemonucleolysis came to the same conclusion. From previously published papers, and also from our own study, it is not clear if these patients have had these psychological distress symptoms to begin with, or if there is some cause-and-effect relationship provoked by the fact that the surgery was performed too late. Radiating leg pain is a symptom not a disease, and the causes of the symptom may lie outside the spinal nerve root, which seems to be the case when the symptoms last for a long time.

From our study it appears that the evolution of sick-leave for low back troubles during the preoperative period can be used as one of the evaluating instruments when surgical treatment in these patients is considered. At the same time, the total duration of postoperative disability is one of the important criteria when the end-results of lumbar disc surgery are assessed.

The results of this study also bear out the following: If the patient has protracted leg pain symptoms but minimal objective findings, one should be very slow to resort to surgical treatment.

Every effort should be made to assess in these patients the role that emotional responses or functional overtones play in the disability presented. There is no place for explorative lumbar surgery in these patients.

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