

RESULTS OF OPERATIVE TREATMENT OF LUMBAR DISC HERNIATION

A Survey of 886 Patients

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Over a period of 6 years (1960-65), 886 patients were operated on for herniated lumbar disc. In 1971, 695 of these patients (78.5 per cent) answered a questionnaire. The material was analysed with the aid of a computer. Persons in the age groups 30-39 (38 per cent) and 40-49 (34 per cent) were most prone to develop sciatica. At operation the distribution of positive findings was found to be 5.7 per cent at level L3-4, 58.3 per cent at L4-5 and 36 per cent at L5-S1. Myelography with a water-soluble medium was performed preoperatively in all cases and gave a correct diagnosis of level in 90.2 per cent. The late results were good in 56 per cent of patients and 63 per cent returned to their former occupation.

Key words: lumbar disc herniation, operative results; sciatica; social factors

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The initial enthusiasm regarding operation for lumbar disc herniation has in recent years been modified by reports of disappointing late results (Falconer et al. 1948, Burns & Young 1951, Spurling & Grantham 1949, Kallio & Törmä 1965, Karaharju et al. 1974). Also there have been reports of good results after conservative treatment of sciatica (Hakelius 1970).

The purpose of this paper is to report an investigation, based on a questionnaire, of the primary and late results of patients operated on for disc herniation, during the period 1960-1965, at the Orthopaedic Hospital of the Invalid Foundation.

MATERIAL

From 1960 to 1965 a total of 886 patients were operated on for sciatica. In 1971 a questionnaire was sent to them. Answers came from 695 patients (78.5 per cent). The data obtained were analysed in a computer.

The operations were performed under general anaesthesia with the patients in a prone position. Exploration was carried out unilaterally with partial removal of laminar bone above and sometimes below the selected level. Hemilaminectomy and facetectomy were seldom necessary. All degenerated disc tissue was removed from the intervertebral space. A posterior fusion was performed simultaneously in 25 patients (2.9 per cent). The sex and age of the patients is shown in Table 1. Sixty-six per cent were males and 34 per cent females. Thirty-eight per cent of the patients belonged to the age group 30-39 years, and 34 per cent to the age group 40-49.

Table 1. Sex distribution and number of patients in the various age groups.

Age	Males	Females	All	%
10-19	3	1	4	0.4
20-29	50	24	74	8.1
30-39	212	121	333	38
40-49	194	111	305	34
50	124	46	170	20.5
	583(66%)	303(34%)	886	100

Table 2. Nature of work before operation.

Heavy manual	289 (33 %)
Manual	243 (27 %)
Light	354 (40 %)
Total	886 (100 %)

Forty per cent were engaged in light work, 27 per cent in manual work and 33 per cent in heavy manual work (Table 2).

The preoperative duration of sciatica was 1-3 months in 42 per cent, 4-12 months in 44 per cent and more than 1 year in 14 per cent of the patients. Sixty-eight per cent had a history of back pain of more than 1 years duration. The radiating pain was left-sided in 51 per cent, right-sided in 40 per cent and bilateral in 9 per cent of cases. The Laségue sign was positive in 81 per cent of the patients. There were eight patients (0.9 per cent) with a cauda equina syndrome. A total of 122 (14 per cent) had previously been operated on, and had a second exploration because of recurrence of sciatica. In 35 patients two levels were explored and in 12 patients three levels.

A preoperative myelography with water-soluble contrast medium (Contrast U) was performed in all cases (Table 3). The myelography was positive in 836 cases. Of these, the operative finding was also positive in 693 cases (83 per cent) and negative in 51 cases (6 per cent). In

92 cases (11 per cent) the operative finding was marked as "adhesion". Out of the 50 cases with negative myelography findings the operative finding was also negative in 14 cases (28 per cent). Thus the myelographic and operative findings agreed with each other, if the cases recorded as "adhesion" are considered as positive findings, in 799 cases or 90 per cent. Of the 86 patients with a weakness of the extensor hallucis longus muscle the disc herniation was located at the level L4-5 in 68 cases, at L5-S1 in 12 and at L3-4 in 6 cases. Out of 200 patients with a weakened ankle jerk the herniation was located at the level L5-S1 in 143 patients and at L4-5 in 66 patients. The rate of negative exploration was 7.0 per cent (65/886). In 92 cases (11 per cent) the positive finding consisted of adhesions to the nerve root.

The distribution of positive operative findings was as follows: L3-4 level: 5.7 per cent, L4-5: 58.3 per cent and L5-S1: 36 per cent.

Patients were allowed to walk about the day after operation. Physiotherapy was commenced if the patient's back was stiff 4-6 weeks after operation.

Complications

Two patients died of embolism of the lung 1 week after operation. The mortality rate was 0.2 per cent. Superficial wound infection occurred in 17 patients (1.9 per cent). Postoperative discitis occurred in four patients (0.4 per cent). These healed with antibiotic treatment in 3-4 months.

RESULTS

Primary results

Of the 656 patients who answered this question 320 (49 per cent) returned to work within 4 months. Ninety-seven patients (15 per cent) were unfit to work for more than 6 months. If the period of inability to work had lasted for a long

Table 3. Myelographic and operative findings.

Myelographic finding	Total	Operative finding		
		Positive	Negative	Adhesion
Positive	836 (100 %)	693 (83 %)	51 (6 %)	92 (11 %)
Negative	50 (100 %)	31 (62 %)	14 (28 %)	5 (10 %)
Total	886 (100 %)	724 (82 %)	65 (7 %)	97 (11 %)

Table 4. Primary results: comparison of periods of inability to work before and after operation.

Period of incapacity before operation (months)	Total	Period of incapacity after operation (months)			
		Less than 2	2-4	4-6	Over 6
0-3	282 (100 %)	155 (55 %)	87 (31 %)	23 (8 %)	17 (6 %)
3-6	150 (100 %)	73 (49 %)	41 (26 %)	10 (7 %)	27 (18 %)
6-12	135 (100 %)	64 (48 %)	37 (27 %)	11 (8 %)	23 (17 %)
Over 1 year	89 (100 %)	28 (31 %)	18 (20 %)	12 (14 %)	31 (35 %)
Total	656 (100 %)	320 (49 %)	183 (28 %)	56 (9 %)	97 (15 %)

Table 5. Primary results: Period of inability to work after operation divided according to nature of work.

Work before operation	Total	Less than 2 months	Returned to work in		
			2-4 months	4-6 months	Over 6 months
Heavy manual	258 (100 %)	83 (32 %)	82 (32 %)	32 (12 %)	61 (24 %)
Manual	268 (100 %)	137 (51 %)	78 (29 %)	21 (8 %)	32 (12 %)
Light	130 (100 %)	100 (77 %)	23 (18 %)	3 (2 %)	4 (3 %)
Total	656 (100 %)	320 (49 %)	183 (28 %)	56 (9 %)	97 (15 %)

Table 6. Late results in terms of the patients' condition at follow-up.

Age	Total	Condition of patient at follow-up		
		Cured	Unchanged	Worse
Under 40 years	306 (100 %)	189 (62 %)	90 (29 %)	27 (9 %)
Over 40 years	314 (100 %)	155 (49 %)	134 (43 %)	25 (8 %)
Total	620 (100 %)	344 (56 %)	224 (36 %)	52 (8 %)

time before operation, convalescence also took a long time (Table 4). The nature of the work also influenced the period of convalescence (Table 5).

Good or satisfactory results were obtained in 70 per cent of cases, fair results in 14 per cent and poor in 16 per cent.

Late results

Some patients did not answer all the questions, and therefore the patient groups differ in number of cases.

The follow-up time was 6-11 years. At follow-up, 344 out of 620 patients (56 per cent) stated that they had little or no pain (Table 6). In 224 patients (36 per cent) the pain was the same as before operation and in 52 (8 per cent) it had become worse. As regards fitness for work at follow-up: 284 out of 652 patients (44 per cent) stated that they were fully capable of working and 274 patients (42 per cent) were in their opinion only partially capable. Ninety-four patients

Table 7. Late results: Nature of work at follow-up.

Work before operation	Total	Previous	Work at follow-up			
			Lighter	Heavier	Not working	On pension
Heavy manual	236 (100 %)	128 (55 %)	33 (14 %)	—	15 (6 %)	60 (25 %)
Manual	249 (100 %)	158 (64 %)	18 (7 %)	6 (2 %)	24 (10 %)	43 (17 %)
Light	124 (100 %)	108 (87 %)	—	3 (2 %)	6 (5 %)	7 (6 %)
Total	636 (100 %)	394 (66 %)	51 (8 %)	9 (2 %)	45 (7 %)	110 (17 %)

(14 per cent) stated that they were unfit for work.

Out of 636 patients, 394 (66 per cent) had returned to their former employment (Table 7), 51 patients (8 per cent) had changed to a lighter job and 9 patients (2 per cent) to a heavier job; 155 patients (24 per cent) stated that they were unfit for work, 110 of them (17 per cent) were receiving a pension. At the time of the follow-up 47 patients were over the age of 63.

The results of 43 fusion operations, 25 in connection with the disc prolapse removal and 18 at a later stage, were satisfactory in half the cases and poor in the other half.

DISCUSSION

Low back pain and sciatica are among the commonest causes of inability to work. Conservative treatment should always be tried first, and patients should be carefully selected for operation.

According to this investigation the following criteria indicated a good result after operative treatment of a prolapsed disc:

Medical factors: No previous back operations. Painful preoperative signs of a herniated disc. A short period of sciatica before operation.

Social factors: Patient not in heavy work or able to change to lighter work if necessary. Preoperative period of unem-

ployment as short as possible. Education more than elementary school. The younger the patient, the better his prognosis.

In this series 33 per cent were doing heavy manual work and 40 per cent non-manual work. This means that a herniated disc can occur in any category of work. It is clear, however, that after operation those doing heavy manual work more often have back pain and recurring sciatica. In younger individuals training for a new lighter occupation is often advisable.

In this series the distribution as regards age and sex of the patients was approximately the same as in other published studies collected by Spangfort (1972).

Seventy-two per cent of the patients belonged to the age group 30-49. The distribution of the level of a positive finding during operation was as follows: 5.7 per cent L 3-4, 58.3 per cent L 4-5 and 35 per cent L5-S1. The rate of herniation at the level L4-5 was somewhat higher in this series than in other publications.

It is difficult to decide the level of herniation on the basis of clinical findings. Myelography using a water-soluble contrast medium (Contrast U) gave a correct diagnosis of level in 90.2 per cent of patients. A negative myelogram sometimes is taken as a contraindication to operation. The clinical signs are decisive, however: a herniation in a large L5-S1 space, for instance, will not always be

visualized during myelography. The new myelography technique with Dimer-X makes exposure in a standing position possible, which makes the investigation even more reliable. In our hospital myelography always precedes an operation. In this series there was a tendency for disc herniation to be located at a higher level with increasing age, which agrees with the observations of Spangfort (1972).

Results indicate that an operation should be considered if a period of 4–6 weeks of conservative treatment gives no relief from pain. If the patient has severe pain, or there are clear signs of root compression and the myelogram is positive, an operation is indicated even sooner. Under these circumstances if the operative finding is positive, the result of operation is generally good. It may seem, however, that the condition of the patient's back 5–11 years after operation is not as satisfactory as the primary results indicated. If the patient is near retirement, prolonged conservative treatment is advisable. The results of reoperation for herniated disc on the same side and level as the primary operation seem not to be very satisfactory. A simultaneous fusion may be indicated by the second exploration. The results of this procedure, however, gave a satis-

factory result in only about half the patients. The results after a third intervention are often poor.

The late results in this series are comparable with earlier published results, 56 per cent of the patients stated that they had little or no pain, and 63 per cent had returned to their former employment.

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