

Ambulatory microsurgical lumbar discectomy

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Microsurgical technique was used for lumbar disc herniation in 132 patients. The procedure was preferably performed under spinal block in a simple prone position. In the first series 68 patients left the hospital 3 days postoperatively while in the second series 64 patients were treated ambulant. Based on self-rating, 87% of the patients expressed an excellent or good result of the operation. A higher rate, 96%, was obtained for patients operated on within 6 months from the onset of symptoms. No complications were encountered due to the ambulation and the patients were satisfied with the early discharge from hospital which may facilitate an earlier return to normal activity.

Key words: Lumbar disc herniation, lumbar discectomy, ambulatory lumbar discectomy

Introduction

After routine laminectomy for lumbar disc herniation patients usually need several postoperative days of care in hospital. At the beginning of this study patients were routinely kept in hospital for 3 days postoperatively. Later due to shortages in the number of beds, the need for an ambulatory surgery approach was called for. The aim of this prospective study was to measure the results of surgery, the intra- and postoperative morbidity and the patients' satisfaction with their treatment.

Methods

Patients

Except for 13 patients with acute cauda equina syndrome all had gone through a long period of conservative treatment for at least 12 weeks. Only patients with more leg pain than back pain were considered for operation. Further inclusion criteria were a positive straight leg raising test and at least one of myotomal, dermatomal or reflex deficit. CT scans were available for 125 patients and a myelogram in seven patients. All patients were offered a rehabilitation programme with a back school 3 weeks postoperatively before return to work.

Surgery

The microsurgical technique, with minimal disc excision as described by Caspar¹ and Wilson^{2,3}, was used in all of the 132 consecutive patients. All operations were performed by one orthopaedic spinal surgeon (the author). Based upon the clinical and radiological findings strictly monosegmental surgery was performed. Not more than one single segment was explored in all patients. The correct interspace was identified under an image intensifier and checked if necessary during the operation. Eighty-six per cent of the patients exhibited extruded fragments. Extraforaminal fragments occurred in 4% and were operated with a paramedian approach with the same microsurgical technique⁴. The simple prone position did not decrease the range of the operation field much and laminotomy was necessary only in cases of large upwards or downwards entrapped fragments. Decompression with medial facetectomy and foramino-tomy was performed in 24 cases of concomitant lateral stenosis. In the beginning of the study a special frame was used to decrease abdominal pressure. The last 64 patients however were lying in a simple prone position on the operating table and no attempt was made to decrease the abdominal pressure. Before closing the wound a free fat graft was placed on the dura as a seal.

Anaesthesia

Spinal block was used in 87, local anaesthesia in 28 and general anaesthesia in 17 operations (Table 1). For local anaesthesia, with the aid of an image intensifier, bupivacain with adrenaline was injected subcutaneously and

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Table 1. Form of anaesthesia in the series of 132 patients

General	17
Spinal	87
Local	28

Table 2. Intra- and postoperative complications in the whole series of 132 patients

Neurological	0
Wound infection	0
Discitis	1
Dural tears	4
Spinal headache	0

without adrenaline into the ligamentum flavum. A small volume deposited just under the ligament often gave a block deep enough for the whole procedure. On demand xylocain spinal was given intrathecally with a 26-gauge needle during the operation. Patients were allowed to walk freely a few hours after the operation.

Review

All patients were followed a clinical examination 1 and 3 months postoperatively. They also filled in a questionnaire about intraoperative and postoperative morbidity using a visual analogue scale (VAS). The recurrence rate after 3 yrs was calculated from the records of all the patients.

Results

An excellent or good result (no or minor back pain or leg pain, no medication needed) was obtained in 87% of the patients. Ninety-seven per cent of the patients operated on within 6 months from the onset of symptoms exhibited excellent or good results compared to 77% for those operated on later (Figure 1).

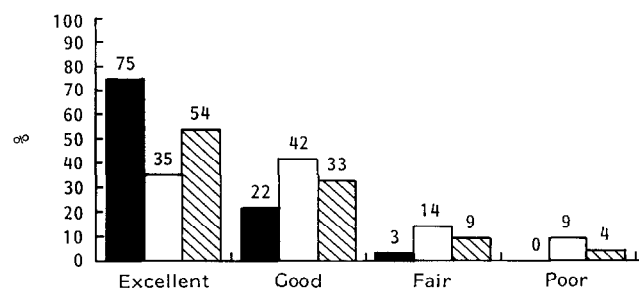


Figure 1. Results of the whole series of 132 patients. The 63 patients operated on within 6 months did much better than the 69 operated on later. ■ 0-6 months; □ 6+ months; ▨ total.

Complications

No neurologic injury was observed (Table 2). Minor dural tears occurred in four operations in the beginning of the series. One case of discitis was treated with antibiotics and eventually resolved with a good result. Spinal headache did not occur in any of the patients given spinal anaesthesia.

Morbidity

In the beginning of the study the intraoperative blood loss was on the average 120 cc (0-400 cc). The simple prone position did not increase bleeding compared to the special frame used or the kneeling position. On the contrary, blood loss decreased (in the last 64 patients) to an average of 10 cc (0-50 cc). Ninety-seven per cent of the patients (Figure 2) found the operation easy and painless (VAS 0-4). No difference was found for general or local anaesthesia. Ninety per cent of the patients scored low values (VAS 0-4) of postoperative back pain (Figure 3).

Hospital stay

At the beginning of the study 68 patients were discharged routinely from hospital on the third postoperative day. The following 64 patients were treated ambulanty (Table 3). Patients were observed in the recovery room 8 h before discharge. The surgeon checked that they had full control over walking and voiding. Next day a telephone call from the surgeon was able to solve minor practical problems. Only if the hospital was very far from the patient's home or if the operation was postponed to late in the afternoon, was the patient kept overnight at the postoperative care unit. The ambulatory patients were satisfied with the early discharge from hospital (86% VAS 0-2), not significantly different from the response given by the in-hospital group of patients (Figure 4).

Recurrence rate

At review after a minimum of 3 yrs postoperatively six patients (4.5%) have been operated on for recurrent disc

Table 3. Ambulation or in-hospital treatment for the series of 132 patients

Same day	36
Overnight	28
Weekend	68

herniation, all at the same level and side as the earlier operation. The same microsurgical technique was used with excellent result in all cases. The free fat pad deposited at the first operation was found viable with an intact dural sheet beneath.

Discussion

In previous reports it is claimed that the overall satisfactory results of microsurgical discectomy of 88–98% is not much higher than those for standard laminectomy, 40–98%^{3,5-12}. It seems that the advantages of the microsurgical technique are mainly less postoperative morbidity and earlier return to normal activity^{3,5,8}; the most important result also in the present study. Only 48% of the patients in this study were referred to a specialist within 6 months from the onset of symptoms. A much higher success rate of 97% was obtained for these patients than for those operated on later. Weber¹³ found a significantly worse outcome in patients with sick leave

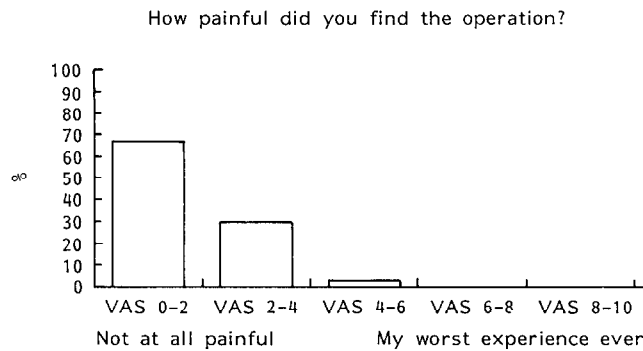


Figure 2. Self-estimation of patients operated on under spinal or local anaesthesia. Results are given by VAS in % of the group of 115 patients.

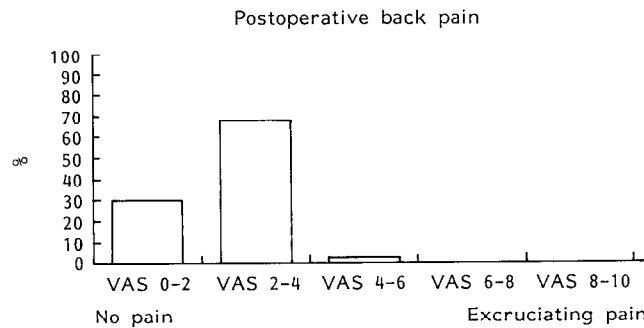


Figure 3. Self-estimation from all the patients in the series operated on with the microsurgical technique. Results are given by VAS in % of the whole group of 132 patients.

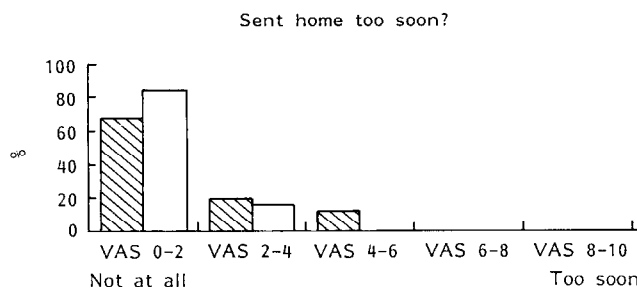


Figure 4. Self-estimation from 68 in-hospital and 64 ambulatory treated patients. Results given by VAS in % of each group of patients did not indicate any dissatisfaction with the ambulatory procedure. ▨ Hospital care; □ ambulatory.

of more than 3 months compared to patients with a shorter sick leave. One of the arguments against microdiscectomy has been an alleged higher rate of infection. This was true for the first reports of a new microsurgical technique^{2,6}. In the present study, however, as in many other more recent studies, the infection rate and the overall complication rate was lower than that reported for conventional surgery¹³⁻¹⁹. The recurrence rate after discectomy is generally around 4% after microsurgery as well as after standard laminectomy^{7,11,15,20,21}. After removing only the extruded fragment a recurrence rate of 9-21% has been found²²⁻²⁵. Subtotal removal of the disc, as in our study, gave a recurrence rate of about 4%^{2,11}. In studies with standard laminectomy the kneeling position has been shown to decrease bleeding²⁶. Bleeding was not increased by the simple prone position used in this study. As a matter of fact in the second part of the present study (64 patients) there was usually no bleeding at all. This was certainly a result of the learning curve of the surgeon and may also have contributed to a decreased operating time and complication rate^{11,13,26}. Patients found the surgical procedure quite simple and painless. Only a few years ago in our clinic patients needed 10 postoperative hospital days after laminectomy. The introduction of the microsurgical technique first led to a decrease to 3 days, and later made the ambulatory procedure possible. In general, postoperative hospital stay is 7 days after laminectomy and 2-3 days after microsurgery^{3,5,8,11,15,19,25,27,28}.

Cares³⁰ reported about 10 cases of ambulatory microsurgical discectomy. His most striking observation was that patients were back to work 3-14 days postoperatively. The ambulatory procedure in lumbar discectomy has up to now not been routine. When questioned, patients generally prefer ambulatory care rather than a hospital stay. In the hands of a well experienced spine surgeon this procedure may decrease the necessity of inpatient postoperative care and facilitate an earlier return to normal activity.

References

- Caspar W. A new surgical procedure for lumbar disc herniation causing less tissue damage through a microsurgical approach. In: *Advances in Neurosurgery*. Berlin, Heidelberg and New York: Springer 1977; 4: 74-81
- Wilson, DH. Microsurgical lumbar discectomy: preliminary report of 83 consecutive cases. *Neurosurgery* 1979; 4: 137-40
- Wilson DH. Microsurgical and standard removal of the protruded lumbar disc. A comparative study. *Neurosurgery* 1981; 8: 422-7
- Maroon JC, Kopitnic TA, Schulhuf LA, Abla A, Wiberger JE. Diagnosis and microsurgical approach to far-lateral disc herniation in the lumbar spine. *J Neurosurg* 1990; 72: 378-82
- Andrews DW, Lavyne MH. Retrospective analysis of microsurgical and standard lumbar discectomy. *Spine* 1990; 4: 329-35
- Ebeling U, Reichenberg W, Reulen HJ. Results of microsurgical lumbar discectomy, review of 485 patients. *Acta Neurochirurgica* 1986; 81: 45-52
- Ebeling U, Kalbarczyk H, Reulen HJ. Microsurgical reoperation following lumbar disc surgery. Timing, surgical findings and outcome in 92 patients. *J Neurosurg* 1989; 70: 397-404
- Kahanovitz W, Viola K, Muculloch J. Limited surgical discectomy and microdiscectomy. A clinical comparison. *Spine* 1989; 1: 79-81
- Lewis PJ, Weir BKA, Broad RW, Grace MG. Long term prospective study of lumbosacral discectomy. *J Neurosurg* 1987; 67: 49-53
- Rish BL. A critique of the surgical management of the lumbar disc disease in a private neurosurgical practice. *Spine* 1984; 5: 500-4
- Silvers HR. Microsurgical versus standard lumbar discectomy. *Neurosurgery* 5: 837-41
- Williams RW. Microlumbar discectomy: a consecutive surgical approach to the virgin herniated lumbar disc. *Spine* 1978; 3: 175-82
- Weber H. Lumbar disc herniation. A controlled prospective study with ten years of observation. *Spine* 1983; 2: 131-40
- Dauch WA. Infection of the intervertebral space following conventional and microsurgical operation on the herniated lumbar intervertebral disc. A controlled clinical trial. *Acta Neurochir (Wien)* 1986; 82: 43-9
- Goald HJ. Microlumbar discectomy: Follow-up of 477 patients. *J Microsurg* 1981; 2: 95-100
- Kardaun JW, White LR, Shaffer WO. Acute complications in patients with surgical treatment of lumbar herniated disc. *J Spinal Disorders* 1990; 1: 30-8
- Scramm J, Oettel F, Umbach W, Wuellenweber R. Komplizierte verläufe nach lumbalen Bandscheibenoperationen. *Nervenarzt* 1978; 1: 26-33
- Spangfort EV. The lumbar disc herniation. A computer aided analysis of 2504 operations. *Acta Orthop Scand suppl.* 1972; 142
- Stolke D, Sollman WP, Seifert V. Intra and postoperative complications in lumbar disc surgery. *Spine* 1989; 1: 56-9
- Zeiger HE. Comparison of chemonucleolysis and microsurgical discectomy for the treatment of herniated lumbar disc. *Spine* 1987; 8: 796-9
- McNab I. Negative disc exploration. An analysis of the causes of nerve root involvement in thirty-eight patients. *J Bone Joint Surgery* 1971; 53A: 891-903
- Spengler DM, Ovelette EA, Battie M, Zett J. Elective discectomy for herniation of a lumbar disc. *J Bone Joint Surgery* 1990; 72A: 230-7
- Rogers LA. Experience with limited versus extensive disc removal in patients undergoing microsurgical operations for ruptured lumbar discs. *Neurosurgery* 1988; 1: 82-5
- Williams RW. Microlumbar discectomy. In: Randolph MA ed. *Surgical techniques*. Codman and Schurtleff, 1977;
- Williams RW. Microlumbar discectomy: a conservative surgical approach to the virgin herniated lumbar disc. *Spine* 1978; 3: 175-82
- Williams RW. Microlumbar discectomy. A 12-year statistical review. *Spine* 1986; 8: 851-2
- Böstman O, Hyrkäs J, Hirvensalo, E, Kallio E. Blood loss, operating time and positioning of the patient in lumbar disc surgery. *Spine* 1990; 5: 360-3
- Goald HJ. Microlumbar discectomy. Follow-up of 147 patients. *Spine* 1978; 2: 183-5
- Goald HJ. Microsurgical removal of lumbar herniated nucleus pulposus. *Surg Gynecol Obstet* 1979; 149: 247-8
- Cares HL, Steinberg RS, Robertsson ET, Caldini P. Ambulatory microsurgery for ruptured lumbar discs. Report of ten cases. *Neurosurgery* 1988; 3: 523-6