1. Introduction:

Microlumbar discectomy is one of the debatable topics of spine surgery. The most important question is “Can we decrease the unsatisfactory results with microsurgery?” If we look at the literature, we can see the successful results with microsurgery. There is no doubt microsurgery helps some parameters such as short operation time, minimal tissue damage, short hospital stay and in many cases short rehabilitation duration before the job (1). But in some literature findings in overall results there are no big differences between the discectomy with microsurgery and microdiscectomy (2). The important question is which factors effect on the unsuccessful results? Are these patient’s history, neurological examination and MRI evaluation?

When the patient tells his/her history, two points is remarkable. The first point is the previous low back pain before the extremity pain. The patient gives at least two, three or more sudden low back pain attacks or complains constant back pain in daily life as least amount one year. The second point is the sudden onset history of low back pain and leg pain. Examination can show a mild to severe neurological deficit either one side or both side. Neurological deficits of the patients strongly effect our decision under a perspective of medical to surgical treatment.

In patients with L5 radiculopathy, weakness of the extensor hallucis longus muscle can be seen. L5 sensory loss can be detected on the sensory examination of the gluteus muscles. The patient may have sciatic pain and show step page on affected side. Gluteus medius muscle can also be weak in patients with L5 radiculopathy. In this situation, the patient shows disordered walking pattern on the affected side. Pelvis may glissade when the patient tries to walk. A discrete mapping of L5 dermatome may be possible on sensory examination of the patient.

In patients with S1 radiculopathy, the strength of the triceps surae group can be decreased and ankle jerk is diminished. Additionally, the examination of the foot shows the weakness of its posh. The patient has sciatic pain and complains to drag the foot along the ground while walking.

Upper lumbar disc herniations are rare and it would expect weakness in the quadriceps muscle. Knee jerk is diminished and the patient complains discharge feelings of affected knee while walking. On sensory examination, there may be a discrete mapping of L4 or upper nerve roots. Sciatic or femoral tension signs are seen in most individuals who present with lumbar disc herniations.

The development of MRI technology is the cornerstone of the diagnosing of lumbar disc disease. We can see the annular rupture of the disc on MRI. The localization and size of annular rupture are important. Wide based annular tear and laxity of posterior annulus can easily be diagnosed in MRI scans and it is related to severe low back pain attacks even in the absence of nerve root compression findings. A little tear including all layers of annulus is always better than laxity of wide based annulus.

2. Natural History:

A natural history of a disc disruption leads up to healing or instability. Some factors affect this process. Especially, strength of paravertebral and abdominal muscles play an important role of healing. If these
muscles are strong enough or the patient showed a great ability to make strong these muscles after a painful attack, probability of a healing process is always high (3).

On the other hand, overweight, hard work stereotype daily life can promote instability of the disrupted disc, or not, a disrupted disc can be a painful disc in the length of the time (4). Sometimes, painful period can start after the simple discectomy operation. Every simple discectomy operation has recurrence rate changing between %3-15, and instability rate % 20 in the next ten years duration after the procedure. This means that % 30 of the patients have painful syndromes in a short or long time periods after discectomy.

3. Indications and Contraindications:

Patient selection and/or preoperative evaluation of the patients should be carefully evaluated, in order to increase patient’s satisfaction after the microdiscectomy. We prefer simple discectomy for the patients who have only small rupture of the annulus with or without extruded disc fragment. If there is an extended fragment material which is located among the annulus layers, we open a small opening on the layer and remove the fragment. After these procedures, this small lax area is shrinked with bipolar coagulation.

In young and athletic patients, we emphasize microdiscectomy, because strong paravertebral muscles will share loading with spinal column. In wide based annulus laxity with herniation, the probability of unsatisfactory results will be quite high; therefore we support microdiscectomy with a dynamic stabilization. In elderly people or patients who have no sport in their life with weak paravertebral muscles, microdiscectomy with dynamic stabilization is a good choice for patients’ satisfaction.

4. Surgical Procedures

4.a. Surgical Equipment

The sterilization equipment for spinal surgery such as betadine, alchole solution, drape and sterile towel are prepared. The C-arm, surgical microscope and microdiscectomy equipment are the main part of this surgical procedure (Figure 1a, 1b).

4.b. Operating room set up

The C- arm and monitor is placed according to the localization of the surgeon, the opposite side of the surgeon should be preferred (Figure 2). The microscope should be located at the opposite side of the surgeon. The spine surgeon, surgical assistant and operation technician are located according to the left or right side of the surgical area.

4.c. Patient positioning

Patient should receive intravenous antibiotics in the operating room prior to surgery. Standard operation
The patient should have prone position. Careful inspection should be done to the eyes, ulnar nerves, and genitalia for the males, and breast for the females to ensure that excessive pressure does not exist. Abdominal viscera and vessels should be checked. The surgical area is propped with an antiseptic solution and covered with sterile clothes. The discectomy level should be found with C-arm before the operation and incision line is marked (Figure 3).

4.d. Surgical Technique

The length of the incision line changes between 1.5 - 2 cm, the lower point of incision should be the upper point of lower spinal process (Figure 4a). While performing incision, subcutaneous tissue should not be destroyed to avoid fat tissue necroses. Fascia should be opened just lateral border of spinous process to keep supraspinous ligament.

After dissection of the muscle tissue on the spinous process and lamina, it should be cared to the two important points. First of them is to save the capsular ligament and second is to leave intact the interspinous ligament; therefore retractor should not be forced against interspinous ligament.

The next stop is to save ligamentum flavum. In L5-S1 level, the ligamentum flavum is opened from the medial side to lateral as a flap like C and fixed with a spinal needle (no: 18) to the lateral wall. Under the microscope magnification, epidural fat tissue retracted medially with nerve root (Figure 4b,4c). This procedure should be performed gently, because there is a very thin layer to keep the fat tissue. If this layer is opened, the dispersed fat tissue can prevent to see the nerve root. The thin layer should be opened just under the nerve root. Some epidural veins can be seen and coagulated with bipolar. After these procedures, disc annulus can easily be found under the nerve root and discectomy is performed (Figure 4d,4e). After the
discectomy, ligamentum flavum is placed on the epidural fat tissue. The fascia is sutured and skin is closed with subcutaneous sutures.

5. Postoperative Care:

The patient should be kept on the bed for six hours after operation. The mobilization and oral food intake of the patient should be started after six hours. Analgesics can be administered to the patient if they need. The patient can be discharged at the same day or the day after operation. We offer one week relaxation time at home. After the relaxation time period, the patients are allowed to begin their job slow by slow. We recommend low back exercise program after 45 days of operation.

6. Complications and Avoidance:

Nerve root injuries, cerebrospinal fluid leakage after dural tear, major vessels injury are rare but major complications of the microlumbar discectomy. Maximum care to the sterility will decrease rate of infection.

7. Illustrative Case:

30 years old female patient in complaining with back and left lower extremity pain. The duration of complains was about 2 month and he had no benefit with medical treatment and physiotherapy program. Neurologic examination revealed weakness of plantar flexion and loss of ankle jerk. S1 dermatomal loss was found.

MR scan revealed L5-S1 disc herniation (Figure 5a,5b). L5-S1 microlumbar discectomy was performed. The patient was uneventful and discharged at the second day. She turned back her job two weeks after operation.
8. References:


Figure 5a, 5b: T2 weighted sagittal and axial MRI scans showing the L5-S1 disc herniation at the left side.