Two years follow-up after microsurgical discectomy and dynamic percutaneous stabilization in degenerate lumbar disc with discal herniation: single centre experience

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Introduction: Microdiscectomy is a common treatment for lumbar disc herniation. Lumbar disc herniation with back pain is often associated to disc degeneration at the same level. Back pain often persists after surgery, prejudicing the clinical outcome.

Objectives: We performed dynamic stabization after lumbar discectomy for degenerated and herniated disc, to prevent further discal degeneration, providing a possible disc restoration. We analyzed and discussed the clinical and neuroradiological outcome after a long-term follow-up.

Methods: 11 patients (3F, 8M; 20-61 years) underwent L5-S1 microdiscectomy and dynamic percutaneous stabilization for discal herniation associated to discal degeneration. Both the discal herniation and the degenerated disc were symptomatic. Patients resulted non responders to non-operative treatment. Dynamic RX films, MRI, Modic and Pfirrmann pre-operative changes were collected in every patient before surgery. Visual Analogue Score (VAS) scores for pain were collected before surgery. In all we performed a percutaneous dynamic stabilization by PercuDyn system™ (constituted of a pediculate screw and a polycarbonate-urethane shock absorber bell; after the percutaneous placement of the screws, the bell is located and fixed to the screw and carefully located between articulation). VAS, Satisfaction Index Test, MRI Modic and Pfirrmann scores and dynamic RX films for all patients were collected at 45 day, 1 years and 2 years after surgery. The percentages of VAS improvement were calculated according to the following formula: (baseline – follow-up) / baseline score X 100. A p < 0.05 was considered significant and all the analyses were conducted with a Two Sided Test (software MedCalc®).

Results: Patients started to walk again 3 hours after surgery and were discharged the morning after surgery, without orthosis. No complications, no device failure occurred. Patients came back to work in 2-4 weeks after surgery. In all cases the dynamic RXs showed the preservation of the motion of the functional spinal unit operated at 45 days after as well as at last follow-up 2-years after surgery. Neither discal herniation recurrences nor fibrosis. The leg pain was completely solved and patients experienced a significant and satisfactory improvement in the VAS score for the back pain. Patients resulted satisfied both at 45 days and at last follow-up. About the neuroradiological outcome. The VAS scores improvement for the back pain resulted statistically significant all over the follow-up.

Conclusions: The Modic classification of vertebral endplates changes includes 3 progressive types of degeneration. The clinical role of the Modic changes remains still unclear. Modic classification does not seem to have prognostic value in predicting post-operative outcome. In Pfirrmann classification 5 grades of progressive degeneration were defined. Authors suggested that dynamic stabilization may prevent progression of the degenerative endplates changes after lumbar discectomy, supporting the discal restoration. We used a percutaneous minimally invasive and complete reversible device (PercuDyn™). In our case
Series pre-operative back pain was associated with Pfirrmann grade III/IV. These results suggest that the dynamic stabilization after microdiscectomy could solve the instability producing good recovery or resolution of the back. Pfirrmann grading seems more reliable in predicting the back pain resolution (specially in grade III/IV). Our long-term follow-up compared to the literature data suggests a crucial role of the dynamic stabilization after microdiscectomy in patients with pre-operative Pfirrmann III/IV, good pre-operative range of motion (tested by dynamic RX films), pre-operative integrity of vertebral articulare processes (verified by MR imaging), pre-operative back pain (non-responding to 8-12 months conservative treatment). Even if our data need further confirmation, dynamic stabilization seems producing complete or good low back pain recovery and full motion preservation until 2-years after surgery.