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Comparison of Single Level L4-L5 versus L5-S1 Lumbar Disc Replacement: Results and Prognostic Factors

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The aim of our prospective non- randomized clinical study was to analyze operative data, short term results, safety, efficacy, complications, and prognostic factors for single level TLDR, and comparing results between different levels (L4-L5 versus L5-S1). 36 patients with single-level L4-L5 or L5-S1 TLDR, with 1-year minimum follow-up, had complete clinical (SF36, VAS, ODI) and radiological data, and were included in our study. Mean follow-up was 38.67 ± 17.34 months. Replaced level was L4-L5 in 12 (33.3%) cases, and L5-S1 in 24 cases (66.7%). Mean age at diagnosis was 41.17 ± 7.14 ys. 24 (66.7%) were female and 12 (33.3%) were male. Statistical analyses were assessed using t tests or Mann-Whitney test for continuous variables and chi-square test or Fisher's exact test analyses for categorical variables. Univariate linear regression and binary logistic regression analysis were utilized to evaluate the relationship between surgical outcomes and covariates (gender, age, etiology, treated level, pre-operative SF36, ODI, and VAS). Mean operative time was 147.03 ± 30.03 min. Mean hospital stay was 9.69 ± 5.39 days, mean return to ambulation 4.31 ± 1.17 days. At 1-year follow-up patients revealed a statistical significant improvement in VAS pain ($P = 0.000$), ODI lumbar function ($P = 0.000$), and SF36 general health status ($P = 0.000$).

Single-level total lumbar disc replacement is a good alternative to fusion for chronic discogenic low back pain refractory to conservative measures. Our study confirmed satisfactory clinical results for monosegmental L4-L5 and L5-S1 disc prosthesis, with no difference between the two different levels both for SF36 ($p = 0.217$), for ODI ($p = 0.527$) and for VAS ($p = 0.269$). However, replacement of the L4-L5 disc is affected by an increased risk of complication ($p = 0.000$). There were no prognostic factors for intraoperative blood loss or return to ambulation. Age ($p = 0.034$) was the only prognostic factor for operative time. Hospital stay was affected by level ($p = 0.036$) and pre-op VAS ($p = 0.006$), while complications were affected by the level ($p = 0.000$) and pre-op ODI ($p = 0.049$). Complete pre-operative assessment (in particular VAS and ODI questionnaires) is important because more debilitating patients will have more hospital stay and higher complications or complaints. Patients had to be informed that complication/ complaints could be frequent (80.6%).