Two-level lumbar total disc replacement: Functional outcomes and segmental motion after 4 years

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INTRODUCTION

Total disc replacement (TDR) has been shown to be non-inferior to spinal fusion for the treatment of two-level degenerative disc disease (DDD), while improving mobility and functional recovery in the short term [1].

OBJECTIVES

Evaluation of the segmental motion, the functional outcomes and the peri-operative complications in the patients who had undergone two-level lumbar TDR after a minimum follow-up of 2 years.

MATERIAL AND METHODS

Continuous and retrospective study of 150 patients operated for 2-level lumbar TDR in case of multi-level symptomatic DDD resistant to medical treatment, with Modic signs on MRI or a positive lumbar discogram.

Inclusion of patients operated with a minimum follow-up of 2 years with complete and usable pre- and post-operative clinical and radiological records.

Final analysis on 108 patients (57 men, 51 women).

Mean age 46 ± 10 years (range 19–73)

Mean follow-up of 49 months (25–63)

Procedure:
- L4/L5 + L5/S1: 93 cases
- L3/L4 + L4/L5: 15 cases

Approach:
- 65 left retroperitoneal approach
- 42 right retroperitoneal approach (2)
- 1 combine approach

Use of the ProDisc-L (Synthes Spine, West Chester, PA, USA)

Time procedure: 111 min (70–230)

Blood loss: 316 mL (50–3500).

Surgical scar: 10 cm (5–18) long

Clinical evaluation:
- Oswestry Disability Index (ODI)
- Lumbar pain / radicular pain / satisfaction VAS

Radiographic assessment:
- Standard A/P + lateral views
- Dynamics images (Cobb’s method)
- Standing A/P + lateral views of the entire spinal column

Results of performed pre- and post-operatively at 3 months, 6 months, 1 year, 2 years and then every 2 years. Data collected prospectively in the context of regular patient follow-up. Data analysed retrospectively by an observer not affiliated with the surgeons and implant manufacturer. Statistical analysis performed with Statview® software (t-test, p<0.05).

RESULTS

Functional results

Improvement of VAS and ODI

Motion (°)

Motion (°) in flexion/extension and lateral flexion at the upper and lower levels

ROM upper level > lower level

ROM L4/L5 > L5/S1

Complications

Implant-related
- 1 PE core not snapped
- 2 implant subsidences

Not implant-related
- 3 iliac veins wounds
- 4 retroperitoneal hematomas
- 1 L5 radicular deficiency
- 1 dura mater wound
- 2 deep vein thrombosis
- 1 wound dehiscence
- 5 urinary infections

DISCUSSION

Function

Lumbar VAS, radicular VAS and ODI comparison to hybrid construct (ALIF + TDR)

The functional improvement is similar to that of other studies in case of multilevel TDR (6,7,8) or hybrid construct (9)

Motion (°)

Motion (°) in flexion/extension and lateral flexion at the upper and lower levels in case of L3/L4-L4/L5 constructs

ROM L3/L4 = L4/L5

The complication rate is equivalent to that of other studies (6,7,8).

CONCLUSIONS

2-level total disc replacement improves functional scores while preserving segmental motion at 4 years follow-up.

REFERENCES