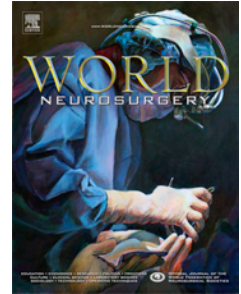


# Accepted Manuscript

Clinical and radiological findings after multilevel cervical total disc replacement:  
defining radiological changes to predict surgical outcomes

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PII: S1878-8750(17)30040-2

DOI: [10.1016/j.wneu.2017.01.030](https://doi.org/10.1016/j.wneu.2017.01.030)

Reference: WNEU 5127

To appear in: *World Neurosurgery*

Received Date: 16 November 2016

Revised Date: 6 January 2017

Accepted Date: 9 January 2017

Please cite this article as: Lee JH, Lee S-H, Lee JH, Clinical and radiological findings after multilevel cervical total disc replacement: defining radiological changes to predict surgical outcomes, *World Neurosurgery* (2017), doi: 10.1016/j.wneu.2017.01.030.

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1        **Clinical and radiological findings after multilevel cervical total disc replacement:**  
2                    **defining radiological changes to predict surgical outcomes**

3  
4    **Abstract**

5    **Objective:** This study compared the radiological parameters between preoperation and  
6    postoperation for patients who underwent multilevel cervical total disc replacement (MCTDR)  
7    and assessed which parameters were related to successful clinical outcomes after MCTDR.

8    **Methods:** The study included a consecutive series of 24 patients who were treated with  
9    MCTDR following the diagnosis of multilevel cervical disc herniation or stenosis. Numeric  
10   Rating Scale (NRS), C2-7 sagittal vertical axis (SVA), range of motion (ROM) of C2-7  
11   segment and TDR implanted levels were evaluated at pre- and post-TDR. These parameters  
12   were compared between patients who experienced successful (S) and unsuccessful (US) pain  
13   relief.

14   **Results:** NRS scores were reduced while C2-7 SVA improved significantly after MCTDR.  
15   C2-7 flexion was significantly decreased ( $p < 0.05$ ), while its extension showed trends toward  
16   considerable ( $P = 0.088$ ) increase, thereby maintaining original C2-7 ROM without statistical  
17   significance. TDR flexion was decreased ( $p < 0.05$ ), while its extension changes were  
18   stationary, consequently resulting in a significant decrease in TDR ROM. ( $p < 0.05$ ) The US  
19   group showed markedly reduced ROM and lack of ROM angular change maintenance both at  
20   the C2-7 and MCTDR levels ( $p < 0.05$ ) compared to the S group.

21   **Conclusions:** MCTDR was effective in reducing pain as well as improving cervical lordosis  
22   in patients with multilevel cervical disc herniation or stenosis. Despite a significant decrease  
23   in the flexion angle, it could maintain C2-7 ROM presumably by compensating with C2-7  
24   extension angle increase. Clinical success after MCTDR was crucially related to retaining  
25   original C2-7 ROM and minimizing ROM angular changes both at the C2-7 and MCTDR

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