

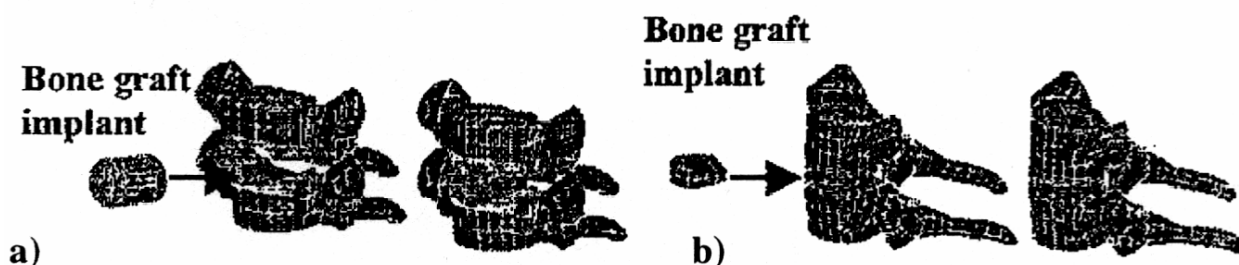
# FINITE ELEMENT ANALYSIS OF CERVICAL SPINE BEFORE AND AFTER DISCECTOMY WITH INTERBODY BONE GRAFT

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One of the most common problems faced recently in medical practice is the clinical complication of the intervertebral disc degeneration. Surgical treatment is employed in those cases when pain does not respond to conservative management and when neurological deficits are developed. Surgical intervention relieves pain and prevents permanent disability caused by neurological deficits. A number of operative procedures have been utilised to relieve compression of the cervical spinal cord and nerve roots caused by a disc disease. Cloward and Robinson and Smith are two of the most common surgical techniques used with reasonable results.



**Fig. 1. Cloward surgery operation technique: a) Robinson-Smith surgery operation technique: b)**

In the paper two surgical techniques (Cloward and Robinsos-Smithe) have been tested. A three dimensional finite element model of intact C2-C7 motion segment was created to study its behaviour under different loading condition using a commercially available finite element application – ANSYS 5. 4. Two types of loads have been applied to three models – to an intact C5-C6 spinal segment and then to the vertebrae after performing two surgical techniques.

Resulting from the numerical analysis one major conclusion can be drawn. In axial compression the largest displacement have been observed after using. Cloward technique while flexural tests show that in a contrary to an axial compression model representing Cloward technique seems to be much stiffer then the one of Robinson-Smith.