Unilateral versus bilateral Pedicle Screw Fixation associated with interbody fusion in degenerative Lumbar spine diseases

Thesis

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By

Mostafa Khalil Ghobashi Khalil
M.B., B.Ch. MSc
Faculty of Medicine, Ain Shams University

Under Supervision of

Prof. Dr. Essam Eldein Abdel Rahman Emara
Professor of Neurosurgery
Faculty of Medicine, Ain Shams University

Assist Prof. Dr. Sherif Hashem Morad
Assistant Professor of Neurosurgery
Faculty of Medicine, Ain Shams University

Dr. Ahmed Roshdy Farghaly
Lecturer of Neurosurgery
Faculty of Medicine, Ain Shams University

Dr. Omar El Farouk Ahmed
Lecturer of Neurosurgery
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
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Mostafa Khalil Ghobashi Khalil

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List of Abbreviations

Abbr.	Full-term
ALIF	**:** Anterior lumbar interbody fusion
ASD	**:** Adjacent segment disease
BAK	**:** Bagby and Kuslich
BPSF	**:** Bilateral pedicular screw fixation
CT	**:** Computed tomography
DBM	**:** Demineralized bone matrix
DS	**:** Degenerative Spondylolisthesis
ECM	**:** Extracellular matrix
MRI	**:** Magnetic resonance imaging
NASS	**:** North American Spine Society
OA	**:** Osteoarthritis
ODI	**:** Oswestry disability index
PEEK	**:** Polythertherketone
PLIF	**:** Posterior lumbar interbody fusion
SD	**:** Standard deviation
SPSS	**:** Statistical Package for Social Science
TLIF	**:** Transforaminal posterior lumbar interbody fusion
UPSF	**:** Unilateral pedicular screw fixation
VAS	**:** Visual Analog Scale
VSP	**:** Variable screw system

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Introduction

Lumbar arthrodesis is a commonly performed surgical procedure for the treatment of spondylosis, trauma, infection, neoplasm, and spinal instability.

A posterolateral fusion with autologous bone graft has traditionally resulted in acceptable clinical results; however, reported fusion rates have been Inconsistent **(Dickman et al., 1992).**

With the addition of internal fixation using pedicle screw instrumentation, fusion rates have improved significantly especially in cases of instability.

Performing an interbody arthrodesis may further Improve the clinical results by eliminating the disc as a potential pain generator, Improving fusion rates, and restoring intervertebral height and lumbar lordosis **(Vaccaro, 2002).**

Techniques to achieve anterior column interbody fusion include anterior lumbar interbody fusion (ALIF), posterior lumbar interbody fusion (PLIF) or transforaminal lumbar Interbody fusion (TLIF) **(JavemickKuklo, 2006).**

Over the last decade, TLIF has become a popular technique for achieving interbody fusion. The TLIF approach may reduce the risk of iatrogenic neurologic injury when compared with PLIF and

provide a circumferential arthrodesis and avoid anterior spinal exposure and its associated complications **(Mayer, 2006).**

The TILF approach carried out from the side that was symptomatic **(Paul et al., 2008).**

Bilateral Pedicle Screw (PS) Fixation after lumbar interbody fusion is accepted as a standard procedure. Providing rigid fixation, bilateral PS fixation has a great biomechanical stability and clinical benefits. However, the rigidity of bilateral PS fixation can lead to device-related osteoporosis of the vertebrae and makes the adjacent segment prone to load- and motion-induced degeneration. Therefore, the use of less rigid systems of fixation has been advocated. Some recent clinical and biomechanical studies on the suitability of unilateral Pedicle Screw fixation have demonstrated that a reliable fusion with fewer pedicle screws can be achieved **(Liu et al., 2014).**