شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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Cortical Bone Trajectory in Posterior Lumbar Fixation

A systematic Review for Partial Fulfillment of master Degree in Orthopedic Surgery

By

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

*First of all, all gratitude is due to **Allah** almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.*

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Mohammed Thapet Faheem

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List of Abbreviations

Abb.	Full term
3D	Three dimentions
ALL	Anterior longitudinal ligament
ASD	Adjacent Segment Disease
BMD	Bone mineral density
CBT	Cortical Bone Trajectory
CSF	Cerebro Spinal Fluid
CT	Computed Tomography
FSU	Functional spinal unit
HU	Hounsfield unit
JOA	Japanese Orthopedic Association
NR	not reported
ODI	Oswestry Disability Index
PLL	Posterior longitudinal ligament
TT	Traditional trajectory
VAS	Visual Analog Scale

INTRODUCTION

Pedicle screw fixation has been the mainstay technique for lumbar spine stabilization for several decades, its superior biomechanical strength and properties surpassing alternative forms of fixation [(1)].

Pedicle screw fixation offers multiple advantages, allowing superior correction of spinal deformities, and reduced rates of loss of fixation and non-union Therefore, this technique has been used in the treatment of a number of lumbar disorders such as deformities, fractures, tumors and degenerative disease [(2)].

The traditional insertion pathway for pedicle screws involves atranspedicular lateral to medial trajectory with the initial insertion point at the junction of the transverse process and lateral wall of the facet joint [(3)].

Several complications are associated with traditional pedicle screw fixation as Screw misplacement despite the use of navigation techniques [(4)]. Screw loosening and loss of surgical construct stability may occur particularly in patients with osteopenia or osteoporosis [(5)].

Additional drawbacks include the significant muscle dissection required for pedicle screw insertion because of its lateral to medial trajectory[(6)], and increased risk of

neurovascular injury documented by multiple reports of incorrect placement of pedicle screw [7].

Over recent years, there have been a number of developments in screw design and implantation techniques, including a proposal for an alternative trajectory for screw fixation aimed at increasing purchase of the pedicle screw in higher density bone. ***Santoni et al*** are The first one to report the cortical bone trajectory (CBT), in which screws follow a lateral path in the axial plane and caudocephalad path in the sagittal plane. In contrast to conventional pedicle screw fixation, CBT screws do not penetrate the vertebral body trabecular space [8].

Aim of Work

A systematic review discussing cortical bone trajectory in posterior lumber fixation.

Chapter (1)

ANATOMY AND BIOMECHANICS OF LUMBER SPINE

Anatomy of the Lumbar Spine:

- Bones and joints.
- Nerves.
- Connective tissues.
- Muscles.
- Motion segment.

This section highlights important structures in each category.